



Operations Guide | PUBLIC

Software Provisioning Manager 1.0 SP39

Document Version: 4.4 – 2023-10-09

# **System Copy for SAP Systems Based on the Application Server ABAP of SAP NetWeaver 7.3 EHP1 to 7.52 on UNIX : SAP HANA Database Target Database: SAP HANA**

# Content

<b>1</b>	<b>Homogeneous and Heterogeneous System Copy - Target Database: SAP HANA. . . . .</b>	<b>9</b>
1.1	About Software Provisioning Manager 1.0. . . . .	10
1.2	SAP Products Based on SAP NetWeaver 7.3 EHP1 to 7.52 Supported for System Copy Using Software Provisioning Manager 1.0 . . . . .	11
1.3	New Features. . . . .	13
1.4	Naming Conventions. . . . .	19
1.5	Constraints. . . . .	20
1.6	Accessing the Installation Guides. . . . .	22
1.7	Accessing the SAP Library. . . . .	22
<b>2</b>	<b>Planning. . . . .</b>	<b>24</b>
2.1	Before You Start. . . . .	24
2.2	Use Cases for System Copy. . . . .	25
2.3	System Copy Methods. . . . .	26
2.4	Creating a System Copy Plan. . . . .	27
2.5	Basic Planning Aspects and Parameters. . . . .	28
2.6	System Copy and Migration Optimization. . . . .	31
	Database Tuning for Source Databases other than SAP HANA. . . . .	31
	Sorted Versus Unsorted Unload. . . . .	33
	Package Splitting. . . . .	33
	Table Splitting. . . . .	34
	R3load Options. . . . .	36
	Migration Monitor. . . . .	37
	Defining the Unload/Load Order. . . . .	37
2.7	Migration to SAP HANA Database. . . . .	38
	General Information About the Migration to SAP HANA. . . . .	38
	Prerequisites and Restrictions. . . . .	41
	Involved Tools. . . . .	41
	Considerations for Performance. . . . .	43
	Database Instance Export on Additional Hosts. . . . .	44
<b>3</b>	<b>Preparation. . . . .</b>	<b>45</b>
3.1	General Technical Preparations . . . . .	45
3.2	Product-Specific Preparations. . . . .	48
3.3	Preparing the Migration to SAP HANA Database. . . . .	49
3.4	Preparing the Media Required for Performing the Export. . . . .	53
	Downloading and Extracting the Software Provisioning Manager 1.0 Archive. . . . .	54

	Downloading Dedicated Kernel Archives for the Export. . . . .	56
<b>4</b>	<b>Database Independent System Copy. . . . .</b>	<b>58</b>
4.1	System Copy Procedure. . . . .	59
	Generating DDL Statements. . . . .	66
	Using a Dedicated Kernel for the Export. . . . .	69
	Preparing the Table Split. . . . .	69
	Preparing the Package Split. . . . .	74
	Preparing Parallel Export and Import. . . . .	75
	Additional Considerations for the Migration to SAP HANA Database (Export). . . . .	76
	Exporting the Source System. . . . .	77
	Setting Up the Target System. . . . .	101
<b>5</b>	<b>Database-Specific System Copy. . . . .</b>	<b>111</b>
5.1	SAP HANA Database-Specific Procedure. . . . .	112
<b>6</b>	<b>Copying Single Instances Only. . . . .</b>	<b>113</b>
6.1	Copying the Primary Application Server Instance Only. . . . .	113
6.2	Copying the Database Only – Move Database Instance. . . . .	114
6.3	Copying the Database Only – Refresh Database Instance. . . . .	115
6.4	Copying the Database Only – Refresh Database Content. . . . .	117
<b>7</b>	<b>Follow-Up Activities. . . . .</b>	<b>119</b>
7.1	Performing Follow-Up Activities in the Source System. . . . .	119
7.2	Performing Follow-Up Activities in the Target System. . . . .	120
	Activities at Operating System Level. . . . .	120
	Performing Follow-Up Activities for ABAP. . . . .	121
<b>8</b>	<b>Additional Information. . . . .</b>	<b>133</b>
8.1	R3load Procedures Using the Migration Monitor. . . . .	133
	About the Migration Monitor. . . . .	134
	Configuration. . . . .	135
	Assigning DDL Files to Packages. . . . .	151
	Defining Groups of Packages. . . . .	152
	Processing Split Tables. . . . .	153
	Starting the Migration Monitor. . . . .	154
	Using the “migmonCtrl” Add-On for the Export. . . . .	159
	Using the migmonCtrl Add-On of the Import Migration Monitor. . . . .	161
	Output Files. . . . .	162
8.2	Analysis of the Export and Import Times. . . . .	163
8.3	Table Comparison with Software Update Manager. . . . .	163
	Restrictions. . . . .	164
	Modes of the Table Comparison Tool. . . . .	164

	Using the Table Comparison Tool. . . . .	165
8.4	Using the Package Splitter. . . . .	167
	Configuration. . . . .	168
	Starting the Package Splitter. . . . .	171
	Output Files. . . . .	172
	Executing the STR Splitter and the WHERE Splitter. . . . .	173
8.5	Troubleshooting for Migration to SAP HANA. . . . .	173
8.6	Starting and Stopping SAP System Instances Using the SAP Management Console. . . . .	175
8.7	Starting and Stopping SAP System Instances Using Commands. . . . .	179

# Document History

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

## i Note

Before you start reading, make sure you have the latest version of this system copy guide, which is available at <https://support.sap.com/sltoolset> > > *System Provisioning* > *Copy a System using Software Provisioning Manager* > *System Copy Option of Software Provisioning Manager 1.0 SP* > .

Version	Date	Description
4.4	2023-10-09	Updated version for software provisioning manager 1.0 SP39 (SL Toolset 1.0 SP39)  Windows operating systems no longer supported for software provisioning manager 1.0 SP39 and higher, according to SAP Note <a href="#">2998013</a> , have been removed.
4.3.1	2023-10-09	Updated version for software provisioning manager 1.0 SP38 (SL Toolset 1.0 SP38): Last version containing information about no longer supported Windows operating systems according to SAP Note <a href="#">3346502</a> .
4.3	2023-05-26	Updated version for software provisioning manager 1.0 SP38 (SL Toolset 1.0 SP38)
4.2	2023-02-13	Updated version for software provisioning manager 1.0 SP37 (SL Toolset 1.0 SP37)
4.1	2022-10-10	Updated version for software provisioning manager 1.0 SP36 (SL Toolset 1.0 SP36)  Operating systems and CPU architectures no longer supported according to SAP Note <a href="#">2998013</a> have been removed.
4.0.1	2022-10-10	Updated version for software provisioning manager 1.0 SP35 (SL Toolset 1.0 SP35): Last version containing information about no longer supported operating systems and CPU architectures according to SAP Note <a href="#">2998013</a> .
4.0	2022-05-24	Updated version for software provisioning manager 1.0 SP35 (SL Toolset 1.0 SP35)
3.9	2022-02-14	Updated version for software provisioning manager 1.0 SP34 (SL Toolset 1.0 SP34)
3.8	2021-10-11	Updated version for software provisioning manager 1.0 SP33 (SL Toolset 1.0 SP33)
3.7	2021-06-21	Updated version for software provisioning manager 1.0 SP32 (SL Toolset 1.0 SP32)
3.6	2021-02-15	Updated version for software provisioning manager 1.0 SP31 (SL Toolset 1.0 SP31)
3.5	2020-10-05	Updated version for software provisioning manager 1.0 SP30 (SL Toolset 1.0 SP30)
3.4	2020-06-08	Updated version for software provisioning manager 1.0 SP29 (SL Toolset 1.0 SP29)
3.3	2020-01-20	Updated version for software provisioning manager 1.0 SP28 (SL Toolset 1.0 SP28)

Version	Date	Description
3.2	2019-09-16	Updated version for software provisioning manager 1.0 SP27 (SL Toolset 1.0 SP27)
3.1	2019-05-27	Updated version for software provisioning manager 1.0 SP26 (SL Toolset 1.0 SP26)
3.0	2019-01-21	Updated version for software provisioning manager 1.0 SP25 (SL Toolset 1.0 SP25)
2.9	2018-09-17	Updated version for software provisioning manager 1.0 SP24 (SL Toolset 1.0 SP24)
2.8	2018-05-07	Updated version for software provisioning manager 1.0 SP23 (SL Toolset 1.0 SP23)
2.7	2018-01-15	<p>Updated version for software provisioning manager 1.0 SP22 (SL Toolset 1.0 SP22)</p> <ul style="list-style-type: none"> <li>• New Features: <ul style="list-style-type: none"> <li>• Software provisioning manager Log Files Improvements, documented in: <i>New Features, Useful Information about the Software Provisioning Manager, Troubleshooting with the Software Provisioning Manager</i></li> <li>• Secure ABAP message server connection, documented in: <i>New Features, SAP System Parameters</i></li> <li>• Using <code>SAPUPTOOL</code> for table splitting, documented in: <i>New Features, Table Splitting, Preparing the Table Split</i></li> <li>• <code>LOADTOOLS</code> .SAR archive in Software Provisioning Manager enabled for NUC, documented in: <i>New Features, Downloading and Extracting the Software Provisioning Manager Archive</i></li> <li>• Enabling IPv6, documented in: <i>New Features, Prerequisites for Running the Software Provisioning Manager</i></li> </ul> </li> <li>• <i>New Features</i> section restructured: As of SP22, a dedicated subsection for each new SP has been created. New features below SP22 remain in a common table.</li> <li>• The Java SDT GUI - which was in the SP21 version still available in parallel to the SL-UI - has been deprecated with SP22. As of SP22, SL-UI is the only available GUI of the software provisioning manager: <ul style="list-style-type: none"> <li>• The following sections which were explicitly related to Java SDT GUI were completely removed from this documentation: <i>Performing a Remote Installation Remote Processing of the Software Provisioning Manager ( Java SDT GUI only), Starting the Java SDT GUI Separately, Running the Software Provisioning Manager in Accessibility Mode</i> (general accessibility information was moved to <i>Useful Information About the Software Provisioning Manager</i>).</li> <li>• The Java SDT GUI-specific information was removed from the common software provisioning manager sections: <i>Running the Software Provisioning Manager, Useful Information About the Software Provisioning Manager, Interrupted Processing of the Software Provisioning Manager, Troubleshooting with the Software Provisioning Manager</i></li> </ul> </li> <li>• New section <i>Using the Step State Editor (SAP Support Experts Only)</i> was added to section <i>Additional Information About the Software Provisioning Manager</i></li> </ul>

Version	Date	Description
2.6	2017-09-11	<p>Updated version for software provisioning manager 1.0 SP21 (SL Toolset 1.0 SP21)</p> <ul style="list-style-type: none"> <li>New Features: <ul style="list-style-type: none"> <li>Media Signature Check, documented in: <i>New Features, Running the Software Provisioning Manager, Preparing the Media Required for Performing the Export</i> . This feature implies that section <i>Creating Kernel Archives from an Existing SAP System</i> has been deleted from this documentation because the related option in the software provisioning manager had to be removed.</li> <li>Load tools are now available as <code>LOADTOOLS.SAR</code> in the Software Provisioning Manager archive, documented in: <i>New Features, Downloading and Extracting the Software Provisioning Manager Archive, System Copy and Migration Optimization, Database Independent System Copy, R3load Procedures Using the Migration Monitor</i></li> <li>Simplified additional application server instance installation, documented in: <i>New Features, Preparing the Installation Media, Downloading SAP Kernel Archives (Archive-Based Installation)</i></li> </ul> </li> </ul>
2.5	2017-05-22	<p>Updated version for software provisioning manager 1.0 SP20 (SL Toolset 1.0 SP20)</p> <ul style="list-style-type: none"> <li>New Features: <ul style="list-style-type: none"> <li>New SAPUI5-based graphical user interface (GUI) "SL-UI", documented in: <i>Prerequisites for Running the Software Provisioning Manager, Running the Software Provisioning Manager, Useful Information About the Software Provisioning Manager</i></li> <li>Cleanup of operating system users, documented in: <i>SAP System Parameters, Creating Operating System Users and Groups</i></li> <li>Refresh database content using a database backup enabled for SAP MaxDB , documented in: <i>Copying the Database Only - Refresh Database Content</i> .</li> </ul> </li> </ul>
2.4.	2017-02-06	<p>Updated version for software provisioning manager 1.0 SP19 (SL Toolset 1.0 SP19)</p> <ul style="list-style-type: none"> <li>New Features: <p>Verification of the integrity of data units in Software Provisioning Manager, documented in: <i>New Features, Downloading the Software Provisioning Manager Archive</i></p> <p>Using a dedicated kernel for the export, documented in: <i>New Features, Using a Dedicated Kernel for the Export , Downloading Dedicated Kernel Archives for the Export, System Copy Procedure</i></p> <p>Refreshing database content using a database backup, documented in: <i>New Features, Copying the Database Only - Refresh Database Content</i> .</p> <p>Option to restrict access to database export directory, documented in: <i>New Features, System Copy Procedure</i></p> </li> <li>Section <a href="#">Preparing the Media Required for Performing the Export [page 53]</a> refactored, created subsections <a href="#">Downloading and Extracting the Software Provisioning Manager 1.0 Archive [page 54]</a>, <a href="#">Downloading Dedicated Kernel Archives for the Export [page 56]</a></li> </ul>

Version	Date	Description
2.3	2016-10-07	<p>Updated version for software provisioning manager 1.0 SP18 (SL Toolset 1.0 SP18)</p> <ul style="list-style-type: none"> <li>New Features: <ul style="list-style-type: none"> <li>Refreshing database content using a database backup, documented in: <a href="#">Copying the Database Only – Refresh Database Content [page 117]</a></li> <li>Using RMOSSWPM*.SAR instead of SWPM*.SAR for outdated OS versions not supported by SAP kernel 7.40 and higher, documented in: <a href="#">Introduction</a> <a href="#">Constraints</a></li> </ul> </li> </ul>
2.2	2016-06-06	<p>Updated version for software provisioning manager 1.0 SP17 (SL Toolset 1.0 SP17):</p> <ul style="list-style-type: none"> <li>Archive-Based Installation (see <a href="#">New Features [page 13]</a>)</li> <li>Export option description corrected in <a href="#">Running Software Provisioning Manager [page 81]</a></li> </ul>
2.1	2016-02-15	Updated version for software provisioning manager 1.0 SP10 (SL Toolset 1.0 SP16)
2.01	2015-10-12	Updated version for software provisioning manager 1.0 SP09 (SL Toolset 1.0 SP15)
2.0	2015-10-12	Updated version for software provisioning manager 1.0 SP09 (SL Toolset 1.0 SP15)
1.9	2015-09-14	Updated version for software provisioning manager 1.0 SP09 (SL Toolset 1.0 SP14)
1.81	2015-04-29	Updated version for software provisioning manager 1.0 SP08 (SL Toolset 1.0 SP13)
1.8	2015-04-27	Updated version for software provisioning manager 1.0 SP08 (SL Toolset 1.0 SP13)
1.7	2014-11-24	Updated version for software provisioning manager 1.0 SP07 (SL Toolset 1.0 SP12)
1.6	2014-07-07	Updated version for software provisioning manager 1.0 SP06 (SL Toolset 1.0 SP11)
1.5	2014-03-17	Updated version for software provisioning manager 1.0 SP05 (SL Toolset 1.0 SP10 )
1.4	2014-03-05	Updated Version
1.3	2013-11-22	Updated version
1.2	2013-10-28	Updated version
1.1	2013-08-19	Updated version
1.0	2013-07-17	Initial version



# 1 Homogeneous and Heterogeneous System Copy - Target Database: SAP HANA

This document describes how to perform a homogeneous or heterogeneous system copy of an SAP system based on the application server ABAP of SAP NetWeaver 7.3 EHP1 to 7.52 with source operating system **UNIX** to **SAP HANA database** as target database, using [software provisioning manager 1.0 SP39 \[page 10\]](#), which is part of SL Toolset 1.0 SP39.

## i Note

SAP products based on SAP NetWeaver 7.10, 7.11, 7.20, 7.30, 7.40 **SR1** (with the exception of SAP Solution Manager 7.2 ABAP, which will continue to be supported ) are only supported in mainstream maintenance until the end of 2020. Extended maintenance will **not** be provided.

For more information, see SAP Note [2980160](#).

You can download the last published version of the guide set for the last Software Provisioning Manager 1.0 SP30 for out-of-maintenance products (SWPM10RMSP30\_<Version>.SAR) from SAP Note [2980160](#).

The guide set attached to SAP Note [2980160](#) covers only the SAP product versions which have reached end of maintenance.

The system copy procedures described in this guide consist of two phases:

1. Export of the source system's database content.
2. Installation of the target system using the source system's database content exported in the previous step.  
The target system installation consists of both the target database and target instance/application server installations.

## i Note

This system copy guide describes only the export of the source system in detail. For the installation of the target system, you use the **installation guide** for the database and operating system platform of your target system. This procedure describes only the additional system copy-specific steps for the target system installation and refers for the remaining steps to the target system [installation guide \[page 22\]](#).

Using software provisioning manager 1.0 you can use [either database-specific methods or database-independent methods \[page 26\]](#).

## i Note

Before you start preparing for a system copy with software provisioning manager 1.0, make yourself also familiar with the Database Migration Option (DMO) of Software Update Manager (SUM) and make a decision, which tool - either Software Provisioning Manager or DMO - would best serve your purpose.

For more information about DMO, see <https://support.sap.com/sltoolset> >> *System Maintenance* > *Database Migration Option with SUM <Version>* and the blog <https://blogs.sap.com/2017/11/22/comparing-sap-migration-procedures-to-sap-hana-database>.

For information about software provisioning manager 1.0, see [About Software Provisioning Manager 1.0 \[page 10\]](#).

For information about SAP system products and releases covered by this guide, see [SAP Products Based on SAP NetWeaver 7.3 EHP1 to 7.52 Supported for System Copy Using Software Provisioning Manager 1.0 \[page 11\]](#).

For information about supported operating system and database platforms, see the Product Availability Matrix at <https://support.sap.com/pam>.

#### **i Note**

Not all SAP NetWeaver releases or SAP Business Suite applications that are available in Software Provisioning Manager 1.0 and are described in this guide might have been released already. To make sure that the system copy options you want to perform are already supported, see SAP Note [1680045](#).

#### **i Note**

As an alternative to using Software Provisioning Manager, you can copy or refresh your system with a completely automated end-to-end framework available using SAP Landscape Management. For more information, see SAP Note [1709155](#) and [https://help.sap.com/docs/SAP\\_LANDSCAPE\\_MANAGEMENT\\_ENTERPRISE](https://help.sap.com/docs/SAP_LANDSCAPE_MANAGEMENT_ENTERPRISE).

## **Related Information**

[About Software Provisioning Manager 1.0 \[page 10\]](#)

[New Features \[page 13\]](#)

[Naming Conventions \[page 19\]](#)

[Constraints \[page 20\]](#)

[Accessing the SAP Library \[page 22\]](#)

## **1.1 About Software Provisioning Manager 1.0**

The software provisioning manager 1.0 is the successor of the product- and release-specific delivery of provisioning tools, such as “SAPinst”. We strongly recommend that you always download the latest version of the software provisioning manager 1.0. The software provisioning manager 1.0 is part of the Software Logistics Toolset 1.0 (“SL Toolset” for short). This way, you automatically get the latest fixes and supported processes. For more information about the software provisioning manager as well as products and releases supported by it, see SAP Note [1680045](#) and <http://scn.sap.com/docs/DOC-30236>.

“SAPinst” has been renamed to “software provisioning manager” in this documentation, but the terms “SAPinst” and “sapinst” are still used in:

- The name of the technical framework of the software provisioning manager. For more information about the SAPinst Framework, see SAP Note [2393060](#).

- Texts and screen elements in the the software provisioning manager GUI (SL Common GUI)
- Names of executables, for example `sapinst`
- Names of command line parameters, for example `SAPINST_HTTPS_PORT`
- Names of operating system user groups, such as the additional group `sapinst`

In the following, we generally refer to the software provisioning manager 1.0 as the “software provisioning manager”. We only use the term “software provisioning manager 1.0” if this is required for technical reasons.




### Related Information

[Preparing the Media Required for Performing the Export \[page 53\]](#)

## 1.2 SAP Products Based on SAP NetWeaver 7.3 EHP1 to 7.52 Supported for System Copy Using Software Provisioning Manager 1.0

Here you can find the list of SAP products based on SAP NetWeaver 7.3 EHP1 to 7.52 that are supported for system copy using Software Provisioning Manager 1.0, on the specific operating system and database combinations described in this guide.

SAP Product	Based on the following SAP NetWeaver Release
SAP S/4HANA 1709 <ul style="list-style-type: none"> <li>• SAP S/4HANA Server</li> <li>• AS ABAP for SAP S/4HANA Frontend</li> </ul>	SAP NetWeaver AS for ABAP 7.52
foundation 1709 on SAP NetWeaver Application Server for ABAP 7.52, version for SAP HANA	SAP NetWeaver AS for ABAP 7.52
SAP NetWeaver AS for ABAP 7.52	SAP NetWeaver AS for ABAP 7.52
SAP S/4HANA 1610 (Out of Maintenance since December 2021):	SAP NetWeaver AS for ABAP 7.51 innovation package
<div> <div>⚠ Caution</div> <div> <p>The options for this product have been removed from software provisioning manager 1.0 as of SP37. These options are still available in the “frozen” software provisioning manager 1.0 SP35 (see SAP Note <a href="#">3220901</a>📄🔗)</p> </div> </div> <ul style="list-style-type: none"> <li>• SAP S/4HANA Server</li> <li>• AS ABAP for SAP S/4HANA Frontend</li> </ul>	

SAP Product	Based on the following SAP NetWeaver Release
SAP NetWeaver AS for ABAP 7.51 innovation package	SAP NetWeaver AS for ABAP 7.51 innovation package
SAP S/4HANA on-premise edition 1511 Server Support Release 1 (Out of Maintenance since December 2020)	SAP NetWeaver 7.5
<div>  <b>Caution</b>            The options for this product have been removed from software provisioning manager 1.0 as of SP37. These options are still available in the “frozen” software provisioning manager 1.0 SP35 (see SAP Note <a href="#">3220901</a>)         </div>	
SAP S/4HANA on-premise edition 1511 Support Release 1 (Out of Maintenance since December 2020)	SAP NetWeaver 7.5
<div>  <b>Caution</b>            The options for this product have been removed from software provisioning manager 1.0 as of SP37. These options are still available in the “frozen” software provisioning manager 1.0 SP35 (see SAP Note <a href="#">3220901</a>)         </div>	
<ul style="list-style-type: none"> <li>• SAP S/4HANA Server</li> <li>• AS ABAP for SAP S/4HANA Frontend</li> </ul>	
SAP Business Suite 7i 2016:	SAP NetWeaver 7.5
<ul style="list-style-type: none"> <li>• EHP4 for SAP CRM 7.0 ABAP</li> <li>• EHP8 for SAP ERP 6.0 ABAP</li> <li>• EHP8 for SAP ERP 6.0 ABAP including SAP S/4HANA Finance 1605 SP03</li> <li>• EHP4 for SAP SRM 7.0 ABAP</li> <li>• EHP4 for SAP SCM 7.0 ABAP</li> </ul>	SAP NetWeaver 7.4 Support Release 2  SAP NetWeaver 7.3 EHP1
SAP BW/4HANA 1.0 (Out of Maintenance since December 2021)	SAP NetWeaver 7.5
<div>  <b>Caution</b>            The options for this product have been removed from software provisioning manager 1.0 as of SP37. These options are still available in the “frozen” software provisioning manager 1.0 SP35 (see SAP Note <a href="#">3220901</a>)         </div>	
	SAP NetWeaver 7.4 Support Release 2  SAP NetWeaver 7.3 EHP1

SAP Product	Based on the following SAP NetWeaver Release
SAP Business Suite 7i 2013 Support Release 2:	SAP NetWeaver 7.5
<ul style="list-style-type: none"> <li>EHP3 for SAP CRM 7.0 ABAP Support Release 2</li> <li>EHP7 for SAP ERP 6.0 ABAP Support Release 2</li> <li>EHP7 for SAP ERP 6.0 ABAP including SAP Simple Finance 1.0 / 1503</li> <li>EHP3 for SAP SRM 7.0 ABAP Support Release 2</li> <li>EHP3 for SAP SCM 7.0 ABAP Support Release 2</li> </ul>	SAP NetWeaver 7.4 Support Release 2 SAP NetWeaver 7.3 EHP1
SAP NetWeaver 7.5	SAP NetWeaver 7.5
SAP Solution Manager 7.2 Support Release 2	SAP NetWeaver 7.4 Support Release 2
AS ABAP 7.4, OEM version 1.0	SAP NetWeaver 7.4 Support Release 2
SAP NetWeaver 7.4 Support Release 2	SAP NetWeaver 7.4
SAP Business Suite, powered by SAP HANA (Out of Maintenance since December 2020):	SAP NetWeaver 7.3 EHP1

**⚠ Caution**

The options for this product have been removed from software provisioning manager 1.0 as of SP37. These options are still available in the “frozen” software provisioning manager 1.0 SP35 (see SAP Note [3220901](#)🔗📄)

- EHP2 for SAP CRM 7.0 On SAP HANA
- EHP6 for SAP ERP 6.0 On SAP HANA
- EHP2 for SAP SCM 7.0 On SAP HANA

## 1.3 New Features

This section provides an overview of the new features in software provisioning manager 1.0.

Make sure that you also read the [Release Notes](#) for your SAP product at <https://help.sap.com>🔗📄 <Search your SAP Product> > <Select your SAP Product Version> > [What's New](#) 📄.


Feature	Description	Availability
New SAPinst Framework Version 753	The SAPinst framework patch level has been upgraded from version 749 (SAP Note <a href="#">2393060</a> 🔗📄 <i>SAPinst Framework 749 Central Note</i> ) to 753. For more information, see SAP Note <a href="#">3207613</a> 🔗📄 <i>SAPinst Framework 753 Central Note</i> .	software provisioning manager 1.0 SP36 (SL Toolset 1.0 SP36)

Feature	Description	Availability
Support of AIX 7.3	AIX 7.3 is now supported for all software lifecycle management options from software provisioning manager. For more information, see SAP Note <a href="#">3104875</a> .	software provisioning manager 1.0 SP34 (SL Toolset 1.0 SP34)
Switch from 7.21_EXT Kernel to 7.22_EXT Kernel	Kernel 7.21 has reached end of maintenance. In addition, some issues have been fixed with the new 7.22_EXT kernel media.	software provisioning manager 1.0 SP31 (SL Toolset 1.0 SP31)
Support of SAP HANA SSL Certificates	Software Provisioning Manager 1.0 supports SAP HANA SSL Certificates for configuring secure access to the SAP HANA database.  For more information, see the <a href="#">installation guide [page 22]</a> .	software provisioning manager 1.0 SP29 (SL Toolset 1.0 SP29)
Support of Linux on IBM Power Systems (little endian)	Software provisioning manager supports as of now Linux on IBM Power Systems (little endian) as operating system platform for SAP systems based on <b>SAP NetWeaver 7.4</b> and higher. For more information, see SAP Note <a href="#">2378874</a> .	software provisioning manager 1.0 SP27 (SL Toolset 1.0 SP27)
Support for Export/Import of Big Tables	Software provisioning manager improvements for Export/Import of SAP HANA files with more than 2 billion entries.  For more information, see <a href="#">Preparing the Table Split [page 69]</a> and SAP Note <a href="#">2784715</a> .	software provisioning manager 1.0 SP26 (SL Toolset 1.0 SP26)
Support of Secure Connection to SAP HANA database.	Software Provisioning Manager 1.0 supports configuring the SAP system to be installed to access the SAP HANA database using encryption.  For more information, see the <a href="#">installation guide [page 22]</a> .	software provisioning manager 1.0 SP26 (SL Toolset 1.0 SP26)
New Look and Feel of SL-UI	As of version 1.0 SP24 Patch Level (PL) 5, the software provisioning manager comes with a new look and feel of the SL-UI. For more information, see <a href="https://blogs.sap.com/2018/11/10/new-look-for-software-provisioning-manager/">https://blogs.sap.com/2018/11/10/new-look-for-software-provisioning-manager/</a> .	software provisioning manager 1.0 SP24, PL05 (SL Toolset 1.0 SP24)
software provisioning manager Log Files Improvements	software provisioning manager log files are now available immediately after software provisioning manager has been started, that is <b>before</b> a product has been selected on the <i>Welcome</i> screen. For more information, see <a href="#">Useful Information about Software Provisioning Manager [page 86]</a> and <a href="#">Troubleshooting with Software Provisioning Manager [page 97]</a> .	software provisioning manager 1.0 SP22 (SL Toolset 1.0 SP22)

Feature	Description	Availability
Using SAPuptool for table splitting	<p>If the SAP kernel version of the source system is 7.40 or higher, the SAPuptool which is contained in LOADTOOLS . SAR is used for table splitting instead of R3ta. For more information, see <a href="#">Preparing the Table Split [page 69]</a>.</p> <div> <p><b>i Note</b></p> <p>This feature is related to features LOADTOOLS . SAR archive in Software Provisioning Manager enabled for NUC in this table below and LOADTOOLS . SAR archive in software provisioning manager below in this table.</p> </div>	software provisioning manager 1.0 SP22 (SL Toolset 1.0 SP22)
LOADTOOLS . SAR archive in software provisioning manager enabled for NUC	<p>The load tools in SWPM10SP&lt;Support_Package_Number&gt;_&lt;Version_Number&gt; . SAR are now also enabled for a system copy using <b>non</b>-Unicode (NUC) SAP kernel version 7.40 or higher.</p> <p>For more information, see <a href="#">Downloading and Extracting the Software Provisioning Manager 1.0 Archive [page 54]</a></p> <div> <p><b>i Note</b></p> <p>This feature enhances feature LOADTOOLS . SAR archive in Software Provisioning Manager of software provisioning manager 1.0 SP21 (SL Toolset 1.0 SP21) (see entry LOADTOOLS . SAR archive in software provisioning manager below in this table).</p> </div>	software provisioning manager 1.0 SP22 (SL Toolset 1.0 SP22)
Media Signature Check	<p>The digital signature of media is checked <b>automatically</b> by the software provisioning manager during the <a href="#">Define Parameters</a> phase while processing the <a href="#">Media Browser</a> screens. The software provisioning manager only accepts media whose digital signature has been checked.</p> <p>For more information, see <a href="#">Preparing the Media Required for Performing the Export [page 53]</a> and <a href="#">Running the software provisioning manager [page 81]</a>.</p>	software provisioning manager 1.0 SP21 (SL Toolset 1.0 SP21)
LOADTOOLS . SAR archive in software provisioning manager	<p>An up-to-date version of the load tools - such as R3load, R3szchk, R3ldctl, SAPuptool - which were available so far only in the SAPEXEDB . SAR archive of the kernel media, has now been made available in the software provisioning manager archive. For more information, see SAP Note <a href="#">2472835</a> . For a system copy using Unicode kernel version 7.40 or higher, the load tools from the SWPM10SP&lt;Support_Package_Number&gt;_&lt;Version_Number&gt; . SAR are used automatically.</p> <p>For more information, see <a href="#">Downloading and Extracting the Software Provisioning Manager 1.0 Archive [page 54]</a></p>	software provisioning manager 1.0 SP21 (SL Toolset 1.0 SP21)

Feature	Description	Availability
Support of Oracle 12.2	software provisioning manager (the “software provisioning manager”) now supports system copy for SAP systems with Oracle 12.2.	software provisioning manager 1.0 SP21 (SL Toolset 1.0 SP21)
SL-UI with SAPINST 7.49	With the new software provisioning manager framework version SAPINST 7.49, you can now use the new SAPUI5-based graphical user interface (GUI) “SL-UI”. For more information, see <a href="#">Useful Information about Software Provisioning Manager [page 86]</a> , <a href="#">Running Software Provisioning Manager [page 81]</a> .	software provisioning manager 1.0 SP20 (SL Toolset 1.0 SP20)
Cleanup of Operating System Users	You can now specify during the <a href="#">Define Parameters</a> phase that the operating system users are to be removed from group <code>sapinst</code> after the execution of software provisioning manager has completed.	software provisioning manager 1.0 SP20 (SL Toolset 1.0 SP20)
Verification of Integrity of Data Units in software provisioning manager	<p>The integrity of data units extracted from the software provisioning manager archive is verified. For more information, see <a href="#">Downloading and Extracting the Software Provisioning Manager 1.0 Archive [page 54]</a>.</p> <p>In addition, check SAP Note <a href="#">1680045</a> whether additional information is available.</p>	software provisioning manager 1.0 SP19 (SL Toolset 1.0 SP19)
Support of Linux on IBM Power Systems (little endian)	software provisioning manager supports as of now Linux on IBM Power Systems (little endian) as operating system platform for SAP systems based on <b>SAP NetWeaver 7.5</b> and higher on SAP HANA. For more information, see SAP Note <a href="#">2378874</a> .	software provisioning manager 1.0 SP19 (SL Toolset 1.0 SP19)
Option to Restrict Access to Database Export	When running the database export, you can specify restricted access to the export directory. For more information, see <a href="#">Prerequisites in System Copy Procedure [page 59]</a> .	software provisioning manager 1.0 SP19 (SL Toolset 1.0 SP19)
Use Dedicated Kernel for System Copy	During the <a href="#">Define Parameters</a> phase of the source system export, you can now specify dedicated SAP kernel archives that you <a href="#">Downloading Dedicated Kernel Archives for the Export [page 56]</a> .	software provisioning manager 1.0 SP19 (SL Toolset 1.0 SP19)
Refresh Database Content for SAP HANA	<p>You can now refresh the content of an existing database using a database backup.</p> <p>For more information, see <a href="#">Copying the Database Only – Refresh Database Content [page 117]</a>.</p>	software provisioning manager 1.0 SP18 (SL Toolset 1.0 SP18)
Archive-Based Installation	You can now download the required <b>installation archives</b> instead of the complete SAP kernel installation media. For more information, see section <a href="#">Downloading Specific Installation Archives (Archive-Based Installation)</a> in section <a href="#">Preparing the Installation Media</a> in the target system <a href="#">installation guide [page 22]</a> .	software provisioning manager 1.0 SP17 (SL Toolset 1.0 SP17)



Feature	Description	Availability
System Provisioning for SAP NetWeaver 7.5 and SAP NetWeaver 7.5-based Products	<p>All system provisioning tasks (installation, system copy, system rename) are available for the new SAP NetWeaver 7.5 release.</p> <p>The Dual Stack option, which integrates an AS ABAP and AS Java in a single system (common System ID <code>&lt;SAPSID&gt;</code>, common startup framework, common database), is no longer supported in SAP systems based on SAP NetWeaver 7.5.</p> <ul style="list-style-type: none"> <li>After upgrading to SAP NetWeaver 7.5 PI, you first have to split the still existing dual stack-system before you can use SAP NetWeaver 7.5 PI productively. For more information, see the <i>Upgrade Master Guide - SAP NetWeaver 7.5</i> at: <a href="http://help.sap.com/nw75">http://help.sap.com/nw75</a> ►► <i>Installation and Upgrade</i> ►</li> <li>SAP NetWeaver 7.5 is Unicode only</li> <li>The primary application server instance directory has been renamed from <code>/usr/sap/&lt;SAPSID&gt;/DVEBMGS&lt;Instance_Number&gt;</code> to <code>/usr/sap/&lt;SAPSID&gt;/D&lt;Instance_Number&gt;</code>.</li> <li>Declustering and depooling of tables during the installation is enabled by default. For more information, see SAP Note <a href="#">1892354</a> .</li> </ul>	software provisioning manager 1.0 SP09 (SL Toolset 1.0 SP15)
System Provisioning for SAP Solution Manager 7.2	<p>All system provisioning tasks (installation, system copy, system rename) are available for the new SAP Solution Manager 7.2 release. Compared to previous SAP Solution Manager releases, SAP Solution Manager 7.2 is no longer provided as a classical dual-stack system (ABAP system with Java Add-in), but consists of a separate ABAP and Java stack.</p>	software provisioning manager 1.0 SP09 (SL Toolset 1.0 SP15)

Feature	Description	Availability
Creating Kernel Archives from existing SAP System	<p>You can reuse the binaries of a dedicated SAP system for a new SAP system installation or target system installation in the context of a system copy by creating *.SAR archives based on the *.lst files from the executable (exe) directories of the source SAP system.</p> <div> <p><b>Note</b></p> <p>This feature is only available for Unicode systems.</p> </div> <div> <p><b>Caution</b></p> <p>This feature has been deprecated with Software Provisioning Manager 1.0 SP21 (SL Toolset 1.0 SP21) and the related option has been removed from the <a href="#">Welcome</a> screen. This deprecation has been accomplished to ensure compliancy with the new feature "Media Signature Check" of Software Provisioning Manager 1.0 SP21 (SL Toolset 1.0 SP21) described above in this table.</p> </div>	software provisioning manager 1.0 SP09 (SL Toolset 1.0 SP14)
Executing R3szchk in Parallel	You can now execute R3szchk in parallel. Using this feature you can improve the runtime of the export.	software provisioning manager 1.0 SP08 (SL Toolset 1.0 SP13)
Database Instance Export on Additional Hosts	<p>To increase the performance of the export you can use more than one SAP application server of the source system for the export.</p> <p>For more information, see <a href="#">Database Instance Export on Additional Hosts [page 44]</a></p>	software provisioning manager 1.0 SP07 (SL Toolset 1.0 SP12)
Feedback Evaluation Form	<p>SAP SE's aim is to provide fast and efficient procedures. To evaluate the procedure you just carried out, we need information generated by the tool during process execution and your experience with the tool itself. A new evaluation form contains a simple questionnaire and XML data generated during the procedure.</p> <p>Port 4239 is used for displaying the feedback evaluation form.</p> <p>For more information, see <a href="#">Prerequisites for Running Software Provisioning Manager [page 78]</a>.</p>	software provisioning manager 1.0 SP07 (SL Toolset 1.0 SP12)
Option <a href="#">Verify Signed Media</a>	<p>The digital signature ensures that the signatory of a digital document can be identified unambiguously and signatory's name is documented together with the signed document, the date, and the time.</p> <p>For more information, see SAP Note <a href="#">1979965</a>.</p>	software provisioning manager 1.0 SP06 (SL Toolset 1.0 SP11)

## 1.4 Naming Conventions

This section contains the naming conventions used in this documentation.

- “usage type”, “technical usage”, and “product instance”  
As of software provisioning manager 1.0 SP07 (SL Toolset 1.0 SP12), the term “product instance” replaces the terms “usage type” and “technical usage”.
- [System Copy](#)  
Duplication of an SAP system. Certain SAP parameters might change in a copy. When you perform a system copy, the software provisioning manager installs all the instances again, but it uses a copy of the source system database to set up the database.
- [Source System and Target System](#)  
The SAP system containing the original database is called the **source system** and the system to which the database copy is to be imported is called the **target system**. Their SAP system names are abbreviated to `SOURCE_SAPSID` and `TARGET_SAPSID`. The terms source database and target database are also used in this description.
- [Homogeneous System Copy](#)  
During homogeneous system copy, you use the same operating system and database platform as the original system.  
You can perform it using either [Database Independent System Copy \[page 58\]](#) or [Database-Specific System Copy \[page 111\]](#) methods.
- [Heterogeneous System Copy](#)  
During heterogeneous system copy, you change either the operating system or the database system, or both. *Heterogeneous system copy* is a synonym for migration.  
You can perform it using the [Database Independent System Copy \[page 58\]](#) method.  
Use this system copy to migrate data of any database platform to the SAP HANA Database platform.
- [Database Copy](#)  
Database-dependent part of the system copy.
- [Placeholders](#)  
Placeholders such as `<SAPSID>` are used in commands. They are used in the same way as in the SAP system installation documentation. You must replace them with the values valid for your site.  
The following additional placeholders are used:

Placeholder	Meaning	How to find out
<code>&lt;SAPSID&gt;</code>	SAP system ID	—
<code>&lt;S_HOST&gt;</code>	System name of the source host	Command <code>hostname</code>
<code>&lt;T_HOST&gt;</code>	System name of the target host	Command <code>hostname</code>
<code>&lt;S_SAPSID&gt;</code>	SAP system ID of the source system	<code>&lt;SAPSID&gt;</code> of the original system
<code>&lt;T_SAPSID&gt;</code>	SAP system ID of the target system	<code>&lt;SAPSID&gt;</code> of the target system
<code>&lt;S_DBSID&gt;</code>	Database ID of the source system	<code>&lt;DBSID&gt;</code> of the original system

Placeholder	Meaning	How to find out
<T_DBSID>	Database ID of the target system	<DBSID> of the target system

### i Note

Database ID <DBSID> identifies the database instance. The software provisioning manager prompts you for the <DBSID> when you are installing the database instance.

The <DBSID> can be the same on IBM i as the <SAPSID>.

- “SAP liveCache” refers to “SAP MaxDB liveCache”.
- “SAP liveCache client” refers to “SAP MaxDB liveCache client”.

## 1.5 Constraints

This section contains the constraints valid for the system copy procedures described in this documentation.

- Effective immediately, the software provisioning manager no longer supports the deprecated CPU architectures and/or operating system versions listed in SAP Note [2998013](#).

### i Note

- If your current operating system is listed as deprecated in SAP Note [2998013](#), we strongly recommend that you migrate to a supported platform.
- If you continue to run Software Provisioning Manager on the deprecated CPU architectures and/or operating system versions listed in SAP Note [2998013](#), you do so at your own risk and without support from SAP. The software provisioning manager 1.0 SP36 and higher will still run on the deprecated CPU architectures and/or operating system versions listed in SAP Note [2998013](#) but it may run into an error. When you start the software provisioning manager, you will see a warning like the following: “Platform Support : Support for SAP JVM on PPC64 big endian for Linux ends June 30 th, 2022. See SAP note 2998013.” If you run into an issue, you must use the “frozen” software provisioning manager **1.0 SP35** software and the related system copy guide. For more information, see SAP Note [3220901](#).

- SAP NetWeaver 7.3 on SAP HANA is only supported for BW. For more information, see SAP Note [1600929](#).
- If SAP HANA is the source database, you **cannot** use the [Database Independent System Copy \[page 58\]](#) procedure for SAP systems based on SAP NetWeaver AS for ABAP 7.52, because SAP NetWeaver AS for ABAP 7.52 already uses certain artifacts in the SAP HANA 2.0 database which are not supported by R3load. Use the [SAP HANA Database-Specific Procedure \[page 112\]](#) instead.
- Declustering with Software Provisioning Manager only works if you perform a system copy of the complete system using the method described in section [Database Independent System Copy \[page 58\]](#). An “inplace-declustering” solution with Software Provisioning Manager is not supported.
- If you want to perform a Unicode Conversion, see one of the following SAP Notes:
  - SAP Note [551344](#) – *Unicode Conversion Documentation*

- SAP Note [1051576](#) – Conversion of Single Code Page Systems to Unicode
- SAP Note [928729](#) – Combined Upgrade & Unicode Conversion (CU)

### i Note

A Unicode Conversion is done as part of a standard system copy. Therefore, you must perform a homogeneous or heterogeneous system copy if you want to convert a system to Unicode.

[Database Move \[page 114\]](#), [Refresh Database Instance \[page 115\]](#), or [Refresh Database Content \[page 117\]](#) do **not** support Unicode Conversion.

- System copy is not supported for the Diagnostics Agent.  
For more information and guidance see the *Diagnostics Agent Maintenance Procedures* article at <http://wiki.scn.sap.com/wiki/x/n4efg>.
- Only perform a system copy if you have experience in copying systems and thorough knowledge of the operating system, the database, and the ABAP Dictionary. Only perform a heterogeneous system copy (of a production, development, or test (QA) system) if you are a certified system support consultant or a certified SAP Technical Consultant.
- SAP does **not** support client transport as a system copy method. Transporting production clients is not supported at all. You can use client transport for the initial setup of an SAP system infrastructure. This documentation does **not** cover the client copy procedure.
- This documentation does **not** describe how to export and import a database with the installation tools for reorganization purposes. Use the appropriate tools for database reorganization, as SAP does not support this installation option.
- If you have made modifications in your development system and want to copy your quality assurance or production system onto the development system, see **SAP Note 130906**.
- This documentation describes how to copy data from one SAP system to another SAP system based on SAP Netweaver Application Server. This documentation does not describe how to copy data from non-SAP systems to SAP systems.
- SAP does not support all data archiving operations after a system copy.  
If you used data archiving in the source system, you might not always have access from the target system to the archive files that were created. For more information, see **SAP Note 153433** and *Data Management Landscape & Transformation Solutions* at <https://support.sap.com/dm&lt>.  
Access from the target system to archived files in the source system without a dedicated archive migration project is only supported as follows:
  - You have copied a source system that uses external data archiving. The target system has read-only access to this archive.
  - You have copied a source system that uses data archiving locally. You can either arrange network access for appropriate archive file sharing or copy all archive files to the file system of the target system.

### i Note

#### Only valid for SAP Business Warehouse:

If you use ADK-based archiving of request administration data in SAP Business Warehouse, you have to copy all archive files related to archiving object BWREQARCH to the file system of the target system. Only then write access (like deletion of requests, deletion of the complete data target content, further upload of data to other targets, changing the quality status of requests or `InfoProvider rebuild`) to requests with archived administration data is possible in the target system of the copy.

In all other cases, contact *Data Management Landscape & Transformation Solutions* at <https://support.sap.com/dm&lt> .

- When you perform a system copy, all product instances or usage types in the source system are copied to the target system. This means that none of the product instances or usage types in the target system can be excluded from the system copy, nor can you select product instances or usage types.
- “Dos and Don'ts” for system copy:
  - **Do:**
    - Follow the Open SQL standard.
    - Make sure that all communication runs through the database pool.
  - **Don't:**
    - Save any system and infrastructure-specific data in business objects. Use a pointer to the central storage of such information, for example:
      - SAP system ID and SID (SAPSID = SID = SAP system name)
      - Host name
      - IP addresses
      - Services and ports
      - Logical destinations and logical system names
      - Other technical infrastructure names
    - Use file system persistency.
    - Set up dependencies between Java and ABAP.

## 1.6 Accessing the Installation Guides

The references to the “installation guide” in this system copy guide always refer to the following location on the SAP Support Portal, where you can access or download the installation guide for your operating system platform, database, and technical stack:

<http://support.sap.com/sltoolset> > System Provisioning > Install a System using Software Provisioning Manager > Installation Option of Software Provisioning Manager 1.0 SP<Current Number> > Installation Guides - Application Server Systems > Installation Guides - Application Server Systems - Software Provisioning Manager 1.0 > SAP Application Server Systems Based on SAP NetWeaver .

In the table, filter for the following: *Database* = <Your Target Database>, *Product Release* = SAP NetWeaver 7.X, *Operating System Platform* = <Your Target OS Platform>, *Technical Stack* = <Your Technical Stack>.

## 1.7 Accessing the SAP Library

The references to the **SAP NetWeaver Library** documentation in this guide always refer to the following on SAP Help Portal. When you come across a reference to SAP Library documentation in this guide, you always have to

add the path of this reference to the basic URL for the SAP NetWeaver release your SAP product is based on, as given in the list below:

- SAP systems based on SAP NetWeaver AS for ABAP 7.52:  
<https://help.sap.com/nw752abap> ► *Application Help* ► *SAP NetWeaver Library: Function-Oriented View* ►
- SAP systems based on SAP NetWeaver Application Server for ABAP 7.51 innovation package:  
<https://help.sap.com/nw751abap> ► *Application Help* ► *SAP NetWeaver Library: Function-Oriented View* ►
- SAP systems based on SAP NetWeaver 7.5:  
<http://help.sap.com/nw75> ► *Application Help* ► *SAP NetWeaver Library: Function-Oriented View* ►
- SAP systems based on SAP NetWeaver 7.4:  
<http://help.sap.com/nw74> ► *Application Help* ► *SAP NetWeaver Library: Function-Oriented View* ►
- SAP systems based on SAP NetWeaver 7.3 including Enhancement Package 1:  
<http://help.sap.com/nw731> ► *Application Help* ► *SAP NetWeaver Library: Function-Oriented View* ►

## 2 Planning

This section describes how to plan your system copy.

[Before You Start \[page 24\]](#)

[Use Cases for System Copy \[page 25\]](#)

[System Copy Methods \[page 26\]](#)

[Creating a System Copy Plan \[page 27\]](#)

Create a plan to perform the system copy.

[Basic Planning Aspects and Parameters \[page 28\]](#)

This section provides information about basic planning aspects and parameters required for system copy.

[System Copy and Migration Optimization \[page 31\]](#)

This section lists several methods that you can use to optimize the standard system copy procedure.

[Migration to SAP HANA Database \[page 38\]](#)

This section provides information about special planning aspects of the migration to SAP HANA database.

### 2.1 Before You Start

- The SAP OS/DB Migration Check prepares you in an optimal way for a successful migration and supports smooth continued operations on the new platform. The OS/DB Migration Check is mandatory, if you are going to migrate a productive system.

For more information, see <https://support.sap.com/support-programs-services/services/os-db-migration.html>. In addition to the information contained on this page, check the *SAP OS/DB Migration Planning Guide* that is available in the *Media Library*.

- **Before** you start the system copy, you must read the following :

- SAP Notes

Read the following SAP Notes for up-to-date information on system copy and corrections to the system copy documentation:

- SAP Note [1680045](#) – *Release Note for Software Provisioning Manager 1.0*
- SAP Note [1738258](#) – *System Copy of Systems Based on SAP NetWeaver 7.1 and Higher*
- SAP Note [888210](#) – *NW 7.\*\*: System copy (supplementary note)*

Make sure that you have the most recent version of the SAP Notes, which you can find at: <https://support.sap.com/notes>.

- Guides for the target system installation

This system copy guide describes only the **source system export** in full detail. As for the installation of the **target system**, this system copy guide describes only the system copy-specific steps in section [Setting Up the Target System \[page 101\]](#), but refers for all steps that are identical with a new system installation to the appropriate operating system and database-specific [installation guide \[page 22\]](#).



- SAP System Copy and Migration at <https://wiki.scn.sap.com/wiki/display/SL/System+Copy+and+Migration>
- SAP system landscape copy:
  - Best Practice document *SAP System Landscape Copy for SAP NetWeaver and SAP Solutions* available at <https://support.sap.com/esacademy>
  - **SAP Note 885343** – SAP System Landscape Copy
  - **SAP Note 1990240** – Support of mixed landscapes (Unicode and Non-Unicode)
  - **SAP Note 82478** – SAP system OS/DB migration
- If you have problems during the system copy, create a customer message using the application area **BC-INS-MIG**.

## 2.2 Use Cases for System Copy

You can apply the system copy for the following:

- Setting up system landscapes, where the SAP systems have different system IDs (<SAPSID>).
- Providing systems for testing, demonstration, training, and standby.  
To create these systems you can either perform an initial system copy or use a database export to overwrite the database of an already existing target system (refresh use case).  
Depending on the purpose of the system, it might be advisable to use the same SAP system ID, even though this prevents you from including the system in a system group for transports.

### i Note

You should perform a system copy in a test system first. This way you can identify customer-specific problems that might result from modifications.

- Changing the operating system, the database, or both.  
You can use different operating system releases or database releases for the source and target systems, but the SAP system release of the source and target systems must be the same.
- Changing the hardware.
- Disaster recovery from an existing database backup

### i Note

#### SAP systems based on SAP NetWeaver 7.4 SP03 and higher:

During any migration or copy of a system with declustered and/or depooled tables – such as an SAP HANA system – your target system receives the same database layout. That is, it receives declustered and depooled tables. Therefore, consider the recommendations for your target platform as described in **SAP Note 1892354**.

### i Note

You can set up the SAP system infrastructure (development, quality assurance, and production system) **without** making a system copy as follows:

1. Install all SAP systems, starting with the development system. Customize the development system as described in the implementation documentation.

2. Transport the client-dependent and client-independent data to the quality assurance and production systems.

However, if you do not follow this concept, you can also install a system, customize it, and then perform a system copy.

## 2.3 System Copy Methods

You can choose between the following system copy methods:

### i Note

Before making your decision, read the documentation *SAP System Copy and Migration* at <https://wiki.scn.sap.com/wiki/display/SL/System+Copy+and+Migration> in order to make yourself familiar with the available system copy and migration procedures.

- **The database-independent procedure using SAP tools**

Use this method if database-specific methods are either not available or not suitable. For more information, see [Database-Independent System Copy \[page 58\]](#).

### i Note

If SAP HANA is the source database, you **cannot** use the [Database Independent System Copy \[page 58\]](#) procedure for SAP systems based on SAP NetWeaver AS for ABAP 7.52, because SAP NetWeaver AS for ABAP 7.52 already uses certain artifacts in the SAP HANA 2.0 database which are not supported by `R3load`. Use the [SAP HANA Database-Specific Procedure \[page 112\]](#) instead.

- **The database-specific procedure using tools provided by the database vendor**

For more information, see [Database-Specific System Copy \[page 111\]](#).

- **Copy single instances only**

The following options are supported:

- You can **move a primary application server instance** to a different host within your system. For more information, see [Copying the Primary Application Server Instance Only \[page 113\]](#).
- You can **move a database instance** to a different host within your system. For more information, see [Copying the Database Only – Move Database Instance \[page 114\]](#).
- You can **refresh an existing database instance** without having to copy the primary application server instance and to reinstall additional applications servers. For more information, see [Copying the Database Only – Refresh Database Instance \[page 115\]](#).
- You can **refresh the content of an existing database** without having to export the database content, but **using a database backup**.

### → Recommendation

We recommend that you use option [Refresh Database Content](#) if you need to equalize the database content of two or more already existing and configured systems, for example in automatized system landscapes with “template” systems which have to correspond to precisely defined standards, such as predefined host names, network settings, users, security policies.

For more information, see [Copying the Database Only – Refresh Database Content \[page 117\]](#).

#### Caution

You **cannot** copy single product instances, usage types, or components!

- **Changing the system variant**

If you want to change your system variant (for example, if you want to make your standard system a distributed or high-availability system), proceed as follows:

1. [Perform the export \[page 77\]](#).
2. For the import, choose the relevant system copy options as described in the process flows of the [system copy procedure \[page 59\]](#).

## 2.4 Creating a System Copy Plan

Create a plan to perform the system copy.

### Procedure

1. When copying a system that contains production data, choose the moment for the copy carefully. This could be a month-end or year-end closing.
2. Consider the downtime of the source system (for preparations and copying) when planning the system copy.
3. Consider a test run.

Perform a test run of the system copy. You can use the time taken by the test run to calculate the system downtime:

- If you want your target system to replace your source system, try to perform a complete test run. This means that the entire database is exported from the source system, transferred to the target system, and imported there. System downtime is approximately equal to the total test time (that is, time for export, transport, and import).
- If you do not want to replace your source system, a partial test run (export of the entire database or parts of it) can be sufficient to calculate the system downtime. The source system is only down for the time of the export.

Calculating the system downtime is particularly important for very large databases (VLDB) or when tapes are being used. The test run is also to determine the amount of export data. Choose the best data transfer method (for example, FTP or tape). We recommend that you only perform read/write actions on local file systems.

4. Define a schedule for the test migration and the final migration.

## 2.5 Basic Planning Aspects and Parameters

This section provides information about basic planning aspects and parameters required for system copy.

### Support of Mixed Landscapes (Unicode and Non-Unicode)

If your system landscape is mixed with Unicode and Non-Unicode systems, or if you have third party software in your system landscape which does not support Unicode at all, check SAP Note [1990240](#) for potential support restrictions.

### Using NFS-Mounted File Systems

Note that the overall performance of the system copy depends on all links in the chain, starting from the performance of the source database to the following:

- Performance of the server on which the export is executed
- File system to which the export data is written
- Target side that reads from the export medium and imports it into the target database
- Use a **local** directory to perform the export, in order to increase the performance and avoid data corruption. When using NFS, consult SAP Note [2093132](#) for recommendations about NFS configuration and restrictions. Also take into account that it may directly affect performance.

You have to make sure that all aspects are configured for optimal performance. For recommendations on NFS configuration, see .

#### i Note

If you want to use NFS for the system copy export, make sure that you create secure file share permissions. Be aware that the communication protocol for NFS needs to be a safe one, for example SSFS.

### SAP System Copy on Oracle Solaris with Oracle Database

For more information about copying SAP Systems on Oracle Solaris with Oracle database, see SAP Note [1848918](#).

### Configuration Analysis and Hardware Configuration

- In the event of a **major change in hardware configuration** (for example, new machine type, new hard disk configuration, new file system type), consult your SAP-authorized hardware partner.

- You need to determine the following:
  - Number of application servers
  - Expected size of the database
  - Additional disks or other hardware required
  - Required memory

#### **i Note**

Refer to the section on hardware and software requirements in the SAP system installation documentation to determine the system requirements.

## Choosing an SAP system ID

You can choose the new SAP system ID `<TARGET_SAPSID>` freely during a new installation.

#### **⚠ Caution**

To meet the requirements of the Workbench Organizer, you must choose different SAP system IDs for different SAP systems.

Make sure that your SAP system ID:

- Is unique throughout your organization  
Do not use an existing `<SAPSID>` when installing a new SAP system.
- Consists of exactly three alphanumeric characters
- Contains only uppercase letters
- Has a letter for the first character
- Does not include any of the reserved IDs listed in **SAP Note 1979280**.
- If you want to install an additional application server instance, make sure that no Gateway instance with the same SAP System ID (SAPSID) exists in your SAP system landscape.

## SAP License

Once the installation is completed and the SAP system copy has been imported, you require a new license key for the target system. The license key of the source system is **not** valid for this system.

For information about ordering and installing the SAP license, see the [SAP Library \[page 22\]](#) for your release at:

#### **i Note**

Navigate to the SAP Help Portal page for the SAP NetWeaver release your SAP product is based on as described in section [Accessing the SAP Library \[page 22\]](#), and then continue the navigation as described below.

► ► [Solution Life Cycle Management](#) ► [SAP Licenses](#) ►

For more information about SAP license keys, see <http://support.sap.com/licensekey> or **SAP Note 94998**.

## Archiving files

Data that has been archived in the source system (data that does not reside in the database but was moved to a different storage location using SAP Archive Management) must be made accessible in the target system. Adapt the file residence information in the target system.

For more information, see the following:

- The [SAP Library \[page 22\]](#) for your release at:

### Note

Navigate to the SAP Help Portal page for the SAP NetWeaver release your SAP product is based on as described in section [Accessing the SAP Library \[page 22\]](#), and then continue the navigation as described below.

► [SAP NetWeaver Library: Function-Oriented View](#) ► [Solution Life Cycle Management](#) ► [Data Archiving](#) ►

- The blogs at <https://blogs.sap.com/2016/10/11/software-application-lifecycle-management-sap-bw/> regarding SAP NetWeaver Application Lifecycle Management and housekeeping

Access to archive files is platform-independent.

## When Using SAP Landscape Transformation Replication Server

If you use SAP Landscape Transformation Replication Server in your system landscape, we recommend that you stop replication and remove existing database triggers before you start the system copy. For more information about SAP Landscape Transformation Replication Server and its dependencies, see SAP Note [1605140](#).

## More Information

FAQ - System Copy and Migration at: <https://wiki.scn.sap.com/wiki/display/SL/FAQ+-+System+Copy+and+Migration>

## 2.6 System Copy and Migration Optimization

This section lists several methods that you can use to optimize the standard system copy procedure.

More information about system copy optimizations can be found in the document System Copy and Migration - Optimization at <https://archive.sap.com/documents/docs/DOC-14257> and in SAP Note [1875778](#).

### [Database Tuning for Source Databases other than SAP HANA \[page 31\]](#)

This is just a list of database parameters which could help you to tune your source database when migrating to SAP HANA. This list is not meant to give you detailed recommendations about the parameter settings.

### [Sorted Versus Unsorted Unload \[page 33\]](#)

### [Package Splitting \[page 33\]](#)

### [Table Splitting \[page 34\]](#)

### [R3load Options \[page 36\]](#)

This section provides information about available R3load options.

### [Migration Monitor \[page 37\]](#)

The migration monitor is a tool which helps you to perform and control the unload and load process during the system copy procedure. The migration monitor is integrated into the Software Provisioning Manager (the "software provisioning manager" for short), but it is also possible to use the monitor for copying older releases by starting it manually.

### [Defining the Unload/Load Order \[page 37\]](#)

## 2.6.1 Database Tuning for Source Databases other than SAP HANA

This is just a list of database parameters which could help you to tune your source database when migrating to SAP HANA. This list is not meant to give you detailed recommendations about the parameter settings.

### Database Tuning Measures – Database Independent

If possible, update the database statistics.

#### **i Note**

This recommendation is not valid for MSSQL Databases. For more information, see SAP Note [1660220](#).

### Database Tuning Measures – IBM Db2 for z/OS

Create indexes deferred.

## Database Tuning Measures – IBM Db2 for Linux, UNIX, and Windows

Refer to the documentation *DB2 Optimization Techniques for SAP Database Migration And Unicode Conversion* available at: <http://www.redbooks.ibm.com/abstracts/sg247774.html> and to the relevant SAP Note.

### i Note

IBM Db2 for Linux, UNIX, and Windows databases have their recommendations in separate notes, one for each release. You can find them easily searching for **Standard Parameter Settings** under SV-BO application area. For example, for IBM Db2 for Linux, UNIX, and Windows V9.7, the relevant SAP Note is [1329179](#).

## Database Tuning Measures – Oracle

- Refer to SAP Notes [936441](#) and [1918774](#) regarding Oracle settings for R3load- based system copy.
- Enlarge the number and size of redo logs experiences from other pilot projects by adding 4 additional redo logs of 100 MB each.
- Enlarge the number of db writers.
- Enlarge temporary tablespace PSAPTEMP (~20-30 GB).
- Increase sort\_area\_size or use pga\_\* parameters.
- Increase PSAPROLL (~20 GB).

## Database Tuning Measures – SAP MaxDB

- You can find general documentation about tuning measures of the current SAP MaxDB release in the [SAP Library for your release \[page 22\]](#) at:

### i Note

Navigate to the SAP Help Portal page for the SAP NetWeaver release your SAP product is based on as described in section [Accessing the SAP Library \[page 22\]](#), and then continue the navigation as described below.

► [Application Help](#) ► [Function Oriented View](#) ► [English](#) ► [SAP NetWeaver by Key Capability](#) ► [Database Administration](#) ► [Database Administration for MaxDB](#) ► [MaxDB](#) ► [Basic Information](#) ► [Concepts of the Database System](#) ► [Performance](#) ►

- Increase the parameter `CACHE_SIZE` to the maximum available size of main memory. Add the unused main memory of non-running Application Server components to the database cache.
- Increase the parameter `MAXCPU` to the maximum available number of processors to which the database system can distribute user tasks.
- You can use the parameter checker. For more information, see SAP Note [1111426](#).



## Database Tuning Measures – SAP ASE

**SAP ASE 16.0 only:** Refer to [SAP Note 1722359](#) for recommendations on how to size and tune the SAP ASE database in an SAP NetWeaver or SAP Business Suite environment.

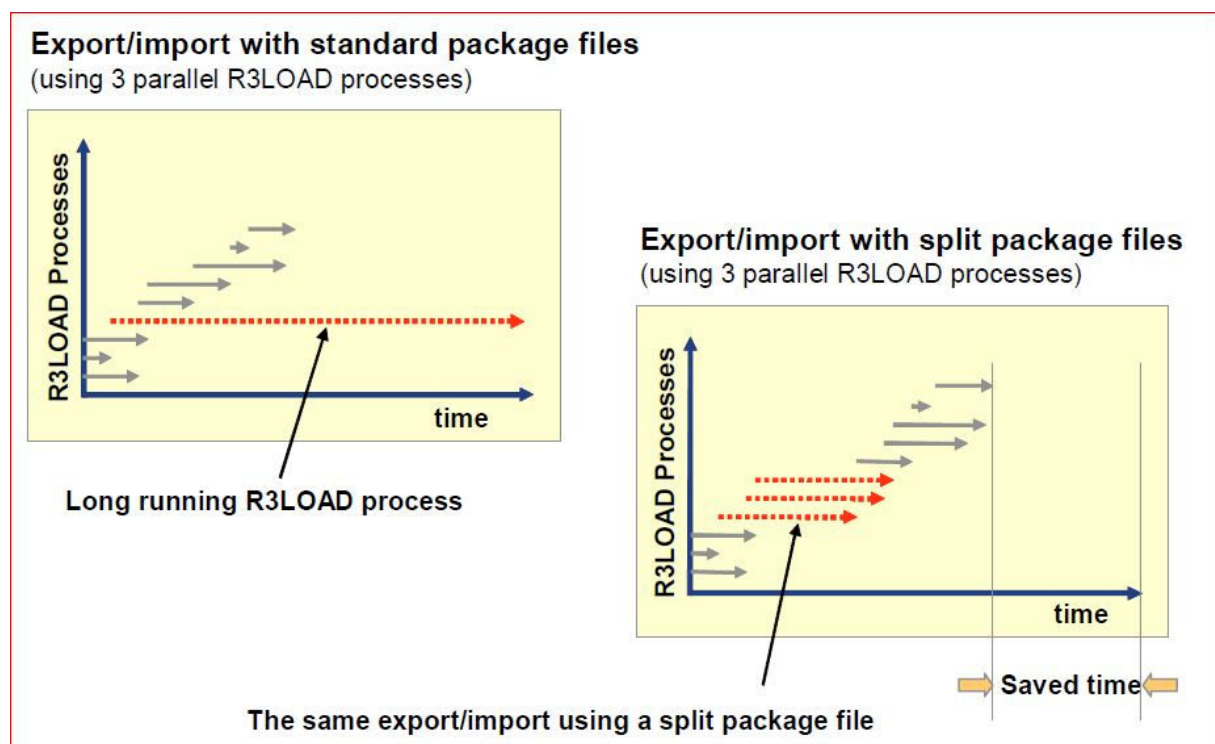
### 2.6.2 Sorted Versus Unsorted Unload

During a system copy, you can perform the data export either “sorted” or “unsorted”.

The default setting is [Use Unsorted Unload](#) - the default was changed from “sorted” to “unsorted” with only some hard-coded exceptions. It is recommended that you keep the defaults. Only change the default on explicit advice by development support.

### 2.6.3 Package Splitting

It might be possible that some packages take long time to be exported due to the fact they contain much data. In such situations it is worth to split the package by using the Package Splitter. An example of the improvement when performing a split can be seen in the figure below:



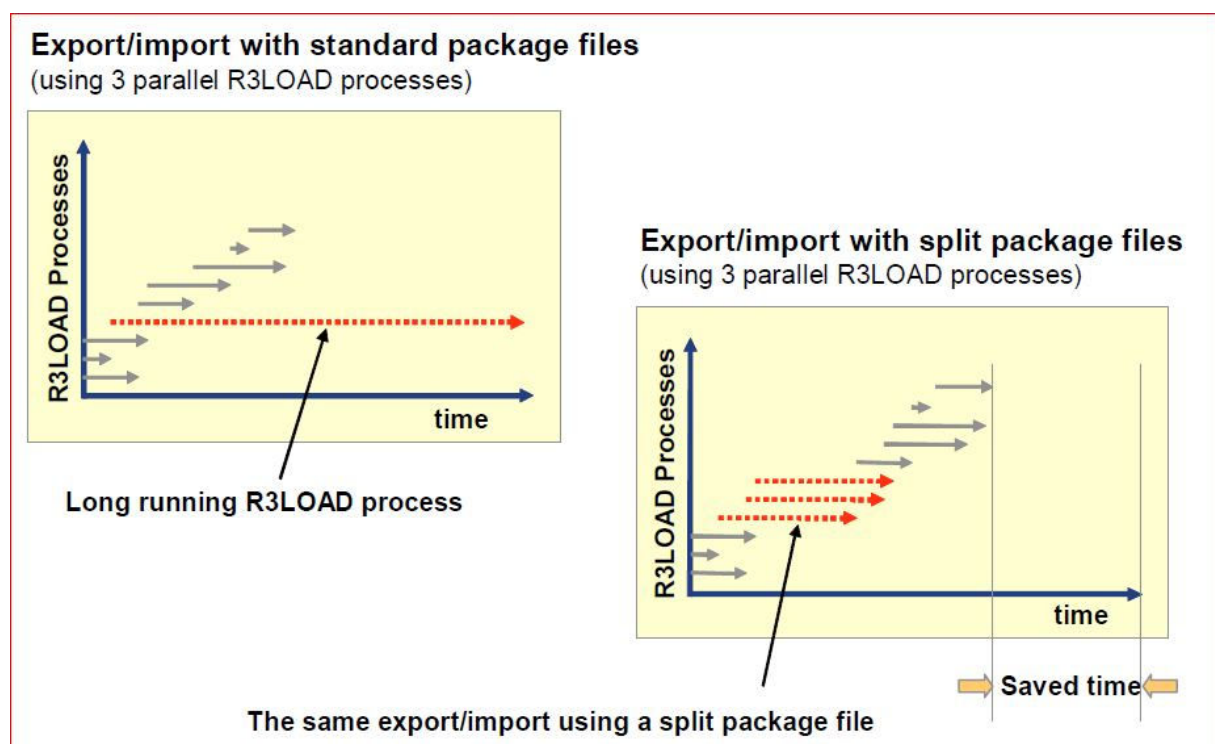
The software provisioning manager by default applies `Package/STR Splitting`. The software provisioning manager prepares and runs the Package Splitter.

## Related Information

[Using the Package Splitter \[page 167\]](#)

### 2.6.4 Table Splitting

It might be possible that specific tables take long time to be exported due to the fact they contain much data. In such situations you might consider splitting the table by using the Table Splitter. An example of the improvement when performing a table split can be seen in the figure below:



For copying large ABAP tables, the tool `R3ta` or - if the SAP kernel version of the source system is 7.40 or higher - `SAPuptool` has been developed to automatically generate `WHERE` conditions, with which a subset of table data can be accessed. These `WHERE` conditions are integrated into the `R3load` `TSK` files. Using `WHERE` conditions may not be optimal for every database management system and therefore has to be considered carefully.

## Availability

You can use table splitting for ABAP systems with SAP kernel 6.40 or higher.

`SAPuptool` is available for table splitting with SAP kernel version 7.40 or higher. It is supported for both Unicode and non-Unicode source system and for both Unicode and non-Unicode target systems.

The software provisioning manager automatically selects the corresponding tool depending on the SAP kernel version

## Advantages

- Large tables are processed in many small packages. If the export or import of a table aborts with an error, only the processing of the package with the error has to be repeated instead of (un)loading the complete table once again.
- The export and import of one table can be performed in parallel by starting several R3load processes to work on some packages in parallel.

## Disadvantages

- If the parallel processing is not optimal or if the single packages are processed serial, the complete processing time for one table may increase when using WHERE conditions.
- **R3ta tool only:** The creation and evaluation of WHERE conditions is an iterating process which requires some experience and some detailed database knowledge. Many manual steps have to be performed.
- **R3ta tool only:** Under certain conditions it is recommended to create additional temporary indexes on the column used in the WHERE condition. Depending on the database, this may not be feasible during productive operation (time consuming, table locking, ...).

## Known Problems

The sorting order may be different on non-Unicode source system and Unicode target system. This may lead to problems when deleting parts of table data during restart. If the import of one package aborted with an error, you therefore have to delete all data from this table and reload them all again.

## Attention

- As the usage of WHERE conditions requires a lot of experience and many manual steps and because there are still some problems not yet solved, we cannot release this feature generally.
- You may use the feature `WHERE conditions` and the `R3ta` or - if the SAP kernel version of the source system is 7.40 or higher - the `SAPuptool` and in many cases it will work without problems, but if you run into problems, you cannot claim for support or an immediate fix of the problem. Nevertheless, we welcome any feedback which helps us to improve the tools.
- The generated `WHERE conditions` should not cover more than one column. If `R3ta` calculated conditions with more columns, run the tool again with different row-count parameters.
- If you decide to create `WHERE conditions` manually (without the `R3ta` or - if the SAP kernel version of the source system is 7.40 or higher - the `SAPuptool`), you must be aware of the fact, that a badly chosen

WHERE condition can increase the total table processing time a lot. In addition, the consultant takes over the responsibility for the completeness of the data!

- You can often reduce the export time of a table which is processed with `WHERE` conditions if you create a (temporary) additional index on the column used within the `WHERE` condition.

#### ⚠ Caution

This may not be possible on databases that need exclusive access on the table when creating an index.


## Database-Specific Information about Table Splitting

**Oracle:** SAP Note [1043380](#)  (*Efficient Table Splitting for Oracle Databases*)



## 2.6.5 R3load Options

This section provides information about available R3load options.

### i Note

An up-to-date version of the load tools - such as R3load, R3szchk, R3ldctl, SAPuptool - which were available so far only in the `SAPEXEDB_<...>.SAR` archive of the kernel media, has now been made available in the software provisioning manager archive (`software provisioning manager10SP<Support_Package_Number>_<Version_Number>.SAR`), in a sub-archive named `LOADTOOLS.SAR`, located in the `COMMON/LOADTOOLS` folder. For a system copy using kernel version 7.40 or higher, the load tools from the `software provisioning manager10SP<Support_Package_Number>_<Version_Number>.SAR` are used **automatically** instead of the loadtools available in the `SAPEXEDB_<...>.SAR` archive of the kernel media. **There is no action required from your side**, the software provisioning manager uses the relevant loadtools automatically once you run it from the extracted `software provisioning manager10SP<Support_Package_Number>_<Version_Number>.SAR` archive. For more information, see SAP Note [2472835](#) .


You can use the following R3load options:

- R3load option `-fast` or `-loadprocedure fast`.
- R3load socket option:  
You can use the socket option, if your R3load has at least patch level 73 (compile date: 12.01.2008)
- Several R3load processes can be launched in parallel to export the packages. However, at a certain point, increasing the number of processes will not help with the performance and has the opposite effect. There is no direct way to determine the optimal number of processes. A rule of thumb though is to use 3 times the number of available CPUs. If you want to find the optimal value, you can perform tests in similar environments, such as in a DEV system.
- **IBM Db2 for Linux, UNIX, and Windows:** For more information, see SAP Note [1058437](#)  – *DB6: R3load options for compact installation*
- **Oracle:** For more information, see SAP Note [1045847](#)  – *Oracle Direct Path Load Support in R3load*

## 2.6.6 Migration Monitor

The migration monitor is a tool which helps you to perform and control the unload and load process during the system copy procedure. The migration monitor is integrated into the Software Provisioning Manager (the “software provisioning manager” for short), but it is also possible to use the monitor for copying older releases by starting it manually.

### i Note


An up-to-date version of the load tools - such as R3load, R3szchk, R3ldctl, SAPuption - which were available so far only in the SAPEXEDB\_<...>.SAR archive of the kernel media, has now been made available in the software provisioning manager archive (software provisioning manager10SP<Support\_Package\_Number>\_<Version\_Number>.SAR), in a sub-archive named LOADTOOLS.SAR, located in the COMMON/LOADTOOLS folder. For a system copy using kernel version 7.40 or higher, the load tools from the software provisioning manager10SP<Support\_Package\_Number>\_<Version\_Number>.SAR are used **automatically** instead of the loadtools available in the SAPEXEDB\_<...>.SAR archive of the kernel media. **There is no action required from your side**, the software provisioning manager uses the relevant loadtools automatically once you run it from the extracted software provisioning manager10SP<Support\_Package\_Number>\_<Version\_Number>.SAR archive. For more information, see SAP Note [2472835](#) .

The migration monitor

- creates R3load command files
- triggers the creation of R3load task files if required
- starts the R3load processes to unload the data
- transfers packages from the source to the target host if required
- starts the R3load processes to load the data as soon as a package is available
- informs the person performing the system copy in case of errors

## More Information

For more information, see:

- [R3load Procedures Using the Migration Monitor \[page 134\]](#)
- SAP Note [784118](#)  (System Copy Tools for ABAP Systems)

## 2.6.7 Defining the Unload/Load Order

If you select the checkbox *Define Special Package Unload Order* on the software provisioning manager screen *SAP System Database Export*, a dialog opens on which you can choose among the following options how to process the packages:

- In alphabetical order

- In custom order
- According to their size (largest first, for import and export)

The migration monitor has a property `orderBy` to specify the order of processing packages.

## 2.7 Migration to SAP HANA Database

This section provides information about special planning aspects of the migration to SAP HANA database.

### Related Information

[General Information About the Migration to SAP HANA \[page 38\]](#)

[Prerequisites and Restrictions \[page 41\]](#)

[Involved Tools \[page 41\]](#)

[Considerations for Performance \[page 43\]](#)

[Database Instance Export on Additional Hosts \[page 44\]](#)

### 2.7.1 General Information About the Migration to SAP HANA

To migrate your source database to the SAP HANA database, you perform a heterogeneous system copy using standard tools, such as the software provisioning manager, `R3load`, and the `migration monitor`.

A heterogeneous system copy has the following characteristics:

- Operating system is changed (in this case, system copy is called OS migration – not relevant for the migration to SAP HANA) or
- Database system is changed (in this case, system copy is called DB migration) or
- Operating system and database system are changed (in this case, system copy is called OS/DB migration)

You perform a heterogeneous system copy using a database-independent procedure (with some exceptions for certain OS migrations, where cross-platform backup or restore is supported).

You can migrate your database to SAP HANA database as of the following releases:

- **SAP Business Warehouse only:** SAP NetWeaver 7.3 EHP1 Support Package 4
- SAP NetWeaver 7.4
- SAP NetWeaver 7.5 and higher

To migrate your database to SAP HANA database, the following conditions have to be met:

- Your SAP system must meet the **minimum** hardware and software requirements listed in the following table:

Requirement	Values
Hardware	Your operating system platform must be 64-bit.
Operating System Version	For a comprehensive list of supported operating system releases, see the Product Availability Matrix (PAM) at: <a href="https://support.sap.com/pam">https://support.sap.com/pam</a> .
Database Software	<p>The following source database platforms are supported:</p> <ul style="list-style-type: none"> <li>Oracle 11.2 or higher</li> <li>MS SQL Server</li> <li>IBM DB2 for Linux, UNIX, and Windows V10.5 or higher</li> <li>SAP MaxDB 7.9</li> <li>SAP ASE 16.0 SP03 or higher</li> <li>IBM Db2 for i 7.2 or higher</li> <li>IBM Db2 for z/OS V11 or higher</li> </ul>
SAP Kernel	<ul style="list-style-type: none"> <li><b>SAP NetWeaver 7.3 EHP1 only:</b> SAP Kernel 7.22 EXT 64-bit is installed.</li> <li><b>AS ABAP 7.4 (SP0 and SP01) only:</b> SAP Kernel 7.38 is installed.</li> <li><b>AS ABAP 7.4 (SP02 and higher) only:</b> SAP Kernel 7.40 or higher is installed.</li> </ul> <p>Update the kernel to the latest patch available in the Marketplace as per SAP Note <a href="#">19466</a>. If an update of the kernel is required, follow the instructions in SAP Note <a href="#">1636252</a>.</p>
SAP Java Virtual Machine (SAP JVM)	SAP JVM 6 or higher is installed.

- SAP HANA database is available only for SAP systems based on SAP Netweaver Application Server **ABAP** or for SAP systems based on SAP Netweaver Application Server **Java**. It is **not** available for SAP NetWeaver dual-stack (ABAP+Java) systems such as SAP Process Integration.

### Note

If your system is a dual-stack (ABAP+Java) one, you first have to split it into one ABAP and one Java stack before migrating to SAP HANA database. For example, perform a dual-stack split procedure before upgrading or uninstall the Java stack and re-install it as a separate system if it is possible for your scenario.

For more information about how to perform a dual-stack split procedure, see the *Dual-Stack Split* guide, which is available at: <https://support.sap.com/sltoolset> > *System Provisioning* > *Split Option of Software Provisioning Manager* > *Dual-Stack Split Guides*

- SAP HANA runs only on Unicode.

## Generic Information

- Read the following information:
  - The blog *Migration to SAP HANA: SAP Kernel update for the migration* in SAP Community Network about R3\* tools provided with the SAP kernel that are involved in the migration to SAP HANA (*Migration to SAP HANA: SAP Kernel Update for the Migration*):  
<http://scn.sap.com/community/it-management/alm/software-logistics/blog/2013/09/30/migration-to-sap-hana-sap-kernel-update-for-the-migration>
  - In addition, take a look at the blog *Migration to SAP HANA using Software Provisioning Manager: How to Begin?* at:  
<http://scn.sap.com/community/it-management/alm/software-logistics/blog/2013/10/04/migration-to-sap-hana-using-swpm-how-to-begin>
  - The blog *SAP BW Powered by SAP HANA- Some points to remember for Database Migration to HANA* providing further details for the migration to SAP HANA – with focus on SAP BW, but partly also valid for general migrations to SAP HANA:  
<http://scn.sap.com/community/netweaver-bw-hana/blog/2013/08/29/sap-bw-powered-by-sap-hana-some-points-to-remember-for-database-migration-to-hana>
- For an overview of migration path options to SAP NetWeaver 7.4 or SAP NetWeaver 7.5 running on SAP HANA, see the End-to-End Implementation Roadmap guides available at: <https://help.sap.com/nw>  
➤ [SAP NetWeaver <7.4 or 7.5> ➤ Integration](#)
- See also page *Migration of SAP Systems to SAP HANA* at <https://blogs.sap.com/2013/12/03/migration-of-sap-systems-to-sap-hana/> for information on planning the migration procedure of your SAP systems to in an on-premise landscape.
- For more information about release and roadmap information around the kernel versions and their relationship to SAP NetWeaver support packages including important notes on downward compatibility and reLSAP HANAease dates, see the document *Understanding Kernel Releases for the SAP NetWeaver AS ABAP* at: <https://archive.sap.com/documents/docs/DOC-54170>

## Application-Specific Information

For the migration of SAP Business Warehouse (SAP BW), see the following information:

- For SAP BW running on SAP HANA, see the *End-to-End Implementation Roadmap for SAP NetWeaver BW powered by SAP HANA* at <https://help.sap.com/nw>  
➤ [SAP NetWeaver <7.4 or 7.5> ➤ Integration](#)
- *SAP NetWeaver BW Application Lifecycle Management* at: <https://blogs.sap.com/2016/10/11/software-application-lifecycle-management-sap-bw/>
- *Best practice information for SAP NetWeaver BW powered by SAP HANA scale out* at: <https://blogs.sap.com/2013/03/27/sap-netweaver-bw-powered-by-sap-hana-scale-out-best-practices/>



## 2.7.2 Prerequisites and Restrictions

Make sure that you take the following prerequisites and restrictions into consideration:

- Delivery of SAP HANA appliances can take some time – therefore, order required target hardware early.
- Before starting the database migration, perform a hardware check using the script `HanaHwCheck.py` – for more information, see SAP Note [1652078](#). In case the hardware check fails, try the latest version of the script that is attached to SAP Note [1658845](#).
- For recommended Linux settings, refer to SAP Note [1824819](#) (SAP HANA DB: Recommended OS settings for SLES11 / SLES4SAP SP2).
- Install the latest available revision of SAP HANA before the migration.
- Make sure that you install a current SAP HANA client that has the same version as the SAP HANA database. For more information about how to install a current SAP HANA client, see SAP Note [1825053](#).
- Install the SAP HANA studio as described in the *SAP HANA Studio Installation Guide* available at [http://help.sap.com/hana\\_appliance](http://help.sap.com/hana_appliance).
- Installation and Upgrade Information and in SAP Note [1789632](#).
- Installation of external software on the SAP HANA appliance must be in compliance with SAP Note [1730928](#).
- To prepare the adjustment of your custom code, install the ABAP Development Tools as described in the guide provided in SAP Note [1718399](#).
- For SAP Warehouse (SAP BW), check SAP Note [1600929](#), providing further information relevant for the migration to SAP HANA.

## 2.7.3 Involved Tools

This section provides expert information and recommendation for some of the involved migration tools.

For an overview of the most important migration tools for ABAP, see <https://archive.sap.com/documents/docs/DOC-34258>.

### Software Provisioning Manager

The software provisioning manager offers many services, including system installation and system copy. For our use case of database migration, it orchestrates all involved tools.


For more information about latest corrections in the software provisioning manager 1.0 for the migration to SAP HANA, see the corresponding blog *Migration to SAP HANA: Latest News about Software Provisioning Manager 1.0* in SAP Community Network at: <https://blogs.sap.com/2013/09/30/latest-news-about-swpm-10-sl-toolset/>.

## migration monitor (Migmon)

The migration monitor is part of software provisioning manager 1.0. It uses the EXT, WHR, STR, TPL files to control the unload and load, to accelerate the load by automatic parallelization, and to generate the R3load task and command files (TSK and CMD files).

Especially for SAP HANA, the migration monitor comprises a `migmonctrl.jar` add-on that gets invoked automatically to adjust the amount of R3load jobs dynamically during the import – this is described in the Import section below.

For more information, see:

- [R3load Procedures Using the migration monitor \[page 134\]](#)
- SAP Note [784118](#)  (System Copy Tools for ABAP Systems)
- [Restarting R3load Processes \[page 100\]](#).

## R3load

R3load performs all load tasks in a database- and platform-independent format. It generates the database export of all SAP objects that are defined in the ABAP Dictionary and archives the configuration and components in the file system. Then, it performs the load of ABAP tables into the target database. It is available via the kernel of the ABAP application server.

## R3ldctl

R3ldctl makes information of source system database tables available for migration tools offline by reading ABAP Dictionary structures from the source database. It creates structure (STR) files that describe the definition of tables, indexes and views, and it creates database-specific template (TPL) files containing commands in Data Definition Language (DDL), which define data structures. R3ldctl is also available via the kernel of the ABAP application server.

For more information, see [Exporting the Source System \[page 77\]](#).

## R3ta or - if the SAP kernel version of the source system is 7.40 or higher - SAPuptool

To copy large tables, use the R3ta table splitter tool or - if the SAP kernel version of the source system is 7.40 or higher - SAPuptool. Both automatically generate WHERE conditions with which a subset of table data can be accessed and with which the export and import of one table can be performed in parallel by starting several R3load processes that work on packages. These WHERE conditions are integrated into the R3load TSK files. If the export or import of a table is cancelled with an error, only the processing of the package with the error has to be repeated instead of loading or unloading the complete table another time. R3ta or - if the SAP kernel version of the source system is 7.40 or higher - SAPuptool is available via the kernel of the ABAP application server.

## Package Splitter

Package Splitter reduces the overall runtime of export and import by distributing packages in an optimal way from the existing structure files (STR + EXT). It is part of software provisioning manager 1.0.

## Time Analyzer (Migtime)

To get statistical data about runtimes, use Migtime. It supports you in analyzing the runtimes of the export and the import:

- It calculates the runtime per package
- It lists the long running objects within a package for further splitting
- It creates a list (either a text or an HTML file) with start and end date or time per package
- It is provided with software provisioning manager 1.0 (MIGTIME.SAR is available in `<Extracted_Software_Provisioning_Manager_Archive>\COMMON\INSTALL`)

For more information, see SAP Note [784118](#).

## Tools Specific for SAP BW

For SAP BW, consider to use the following specific tools:

- A specific checklist tool for SAP BW (see SAP Note [1729988](#) – *SAP NetWeaver BW powered by SAP HANA - Checklist Tool*) automates the check of best practice guidelines for operations and pre-requisites for the migration of an existing SAP BW system to SAP HANA.
- Before migrating to SAP BW on SAP HANA, you can use the SAP BW ABAP Routine Analyzer to identify ABAP statements that can potentially be optimized for SAP HANA – for more information, see SAP Note [1847431](#) (*SAP NetWeaver BW ABAP Routine Analyzer*).
- To make the migration of an existing SAP BW deployment to SAP HANA easier, the SAP NetWeaver Migration Cockpit for SAP HANA combines several tools – for more information, see SAP Note [1909597](#) (*SAP NetWeaver BW Migration Cockpit for SAP HANA*).

## 2.7.4 Considerations for Performance

Note the following recommendations for the performance of the migration procedure:

- As a rule of thumb, it is recommended that you configure two or three parallel R3load processes per CPU on the host on which the corresponding R3load is running.
- Closely monitor the CPU and I/O utilization to adapt the number to actual project conditions.
- If possible, keep a dedicated internal disk with an own controller for the export directory.
- Only change table type from column store to row store, if proposed by SAP HANA development support.

- We recommend to use the mass loader option of the software provisioning manager:
  - For this, SAP HANA Revision 51 or higher is required (see SAP Note [1806935](#)🔗)
  - To activate the option, set the environment variable `HDB_MASSIMPORT=YES` before starting the software provisioning manager.
- With the latest versions of the software provisioning manager, parallel export/import is available for products based on SAP NetWeaver 7.3 including EHP1. For latest information, see SAP Note [1775293](#)🔗.
- If scale-out is released for your product, consider to use an SAP HANA standby server node for the import to improve performance. For more information, see the corresponding information in [Installing the Target System - Additional Considerations for the Migration to SAP HANA Database \[page 107\]](#).
- Throughput is quite individual and depends on the hardware configuration and other factors. You can use the Java tool Migtime to evaluate the runtime of export/import – for more information, see SAP Note [784118](#)🔗. It might require multiple runs to find bottlenecks and optimize them.
- For comparing ABAP code execution times after a migration to SAP HANA, consider the recommendations in SAP Note [1942889](#)🔗 (Comparing ABAP code execution times after HANA migration).
- To increase the performance of the export you can use more than one SAP application server of the source system for the export. For more information, see [Database Instance Export on Additional Hosts \[page 44\]](#).

## 2.7.5 Database Instance Export on Additional Hosts

Especially for the migration to SAP HANA, it has become common to use an SAP HANA standby server for the import into the database instance. As SAP HANA servers are very powerful, the import is delayed because it has to wait for the relatively slow data delivery from the export.

To increase the performance of the export you can use more than one SAP application server of the source system for the export. For example, you can use the hosts of the existing additional application server instances of the source system.

You can do this by choosing [Database Instance Export on Additional Host](#) in the software provisioning manager after starting the [Database Instance Export](#).

During the procedure, if the feature is chosen, “package-filter files” are created, which split the packages into equal (by size or runtime) parts according to the number of hosts entered.

For more information about the additional steps required for this procedure, see [System Copy Procedure \[page 59\]](#).

## 3 Preparation

Before you start the system copy, you must perform the following preparation steps.

### 3.1 General Technical Preparations

To make a consistent copy of the database, you need to prepare the source system and perform some subsequent actions on the target system. This is not necessary when performing a test run.

#### Context

The following section describes important preparations on the source system before you perform homogeneous or heterogeneous system copy.

For more information about SAP System Administration, see the *Administration* information in the [SAP Library \[page 22\]](#) for the SAP NetWeaver release your source system is based on:

#### i Note

Navigate to the SAP Help Portal page for the SAP NetWeaver release your SAP product is based on as described in section [Accessing the SAP Library \[page 22\]](#), and then continue the navigation as described below.

SAP NetWeaver Release	SAP Library Path
<ul style="list-style-type: none"><li>• SAP systems based on SAP NetWeaver 7.3 including Enhancement Package 1</li><li>• SAP systems based on SAP NetWeaver 7.4</li><li>• SAP systems based on SAP NetWeaver 7.5</li><li>• SAP systems based on SAP NetWeaver Application Server for ABAP 7.51 innovation package</li><li>• SAP systems based on SAP NetWeaver Application Server for ABAP 7.52</li></ul>	<a href="#">Operations</a> > <a href="#">Technical Operations for SAP NetWeaver</a> >

#### Procedure

1. Before you start a system copy, check the minimum kernel patch level required by the support package level of the source system.

It might be necessary to replace the SAP kernel delivered with the installation kit and installed during the installation of the target system by a newer kernel patch level before starting the target system. If you have to replace the delivered SAP kernel, you can do this after the installation of the primary application server instance.

For more information about release and roadmap information around the kernel versions and their relationship to SAP NetWeaver support packages including important notes on downward compatibility and release dates, see the document *Understanding Kernel Releases for the SAP NetWeaver AS ABAP* at: <https://archive.sap.com/documents/docs/DOC-54170>

2. Check if canceled or pending update requests exist in the system. If canceled or pending updates exist, you must update these again or delete them from all clients. Proceed as follows:
  - a. Call transaction **SM13**.
  - b. Delete the default values for the client, user, and time.
  - c. Choose all update requests.
  - d. Check if table **VBDATA** contains any entries. If there are entries, update or delete the corresponding update requests.
  - e. To check whether this action was successful, call transaction **SE16** for table **VBDATA**.

3. Stop scheduling of all released jobs.

Go to transaction **SE38** and run report **BTCTRS1**. For more information, see SAP Note [37425](#).

4. Adapt the operation mode timetable to make sure that no switching of operating modes takes place while a system is being copied (transaction **SM63**).

5. Write down the logical system names of all clients:

- If you plan to overwrite an existing system with a system copy, make sure you write down the logical system names of all clients in the system that will be overwritten (transaction **SCC4**). Since the logical system names will be overwritten, in the event of differences, you must change them back to their original names (as they existed in the system that is overwritten) in the follow-up actions after the system copy.
- If you create a new system with a system copy (for example, create an upgrade test system), make sure that the logical naming strategy for this new system is consistent with your existing logical system naming convention.

**SAP Business Warehouse (BW)** only: If you are still in the process of planning your BW system landscape, see SAP Note [184447](#) for information about how to set up your system landscape, especially for information about system naming.

- If your system copy is used to replace hardware for the DB server, migrate to a different database system or operating system (that is, source system for the copy is the same as the copy target), no changes to logical system names are required.
6. Before you run the export of the SAP HANA database, check the fragmentation of the rowstore and – if required – defragment it as described in SAP Note [1813245](#).
  7. Before performing the source system export, make sure that you do the following:
    - a. Delete **QCM** tables from your source system:
      1. **Before** you delete the **QCM** tables, ensure the following:
        - The tables are consistent – no restart log or conversion procedure termination must be displayed.
        - The data of the original table can be read.
        - The application programs that use the affected original table run correctly.
      2. Call transaction **SE14**.

3. Choose ► [Extras](#) ► [Invalid temp. table](#) ►  
All QCM tables that can be deleted are displayed.
4. Mark the tables and delete them.
- b. Run report RS\_SCRP\_D020S\_CLEAN to check if there are invalid entries in tables D020S and DYNPSOURCE. If invalid entries are detected, remove them before running the export. For more information, see SAP Note [870601](#) 📄.
8. To avoid stopping the database due to a log directory being full, make sure that the log backup is enabled during the import.
9. **Heterogeneous System Copy:** If you plan to migrate your database to SAP HANA database, do the following:
  - a. Perform the preparation steps described in SAP Note [1600929](#) 📄.
  - b. Perform the following preparation steps:
    - **SAP BW only:**  
Perform the preparation steps described in SAP Note [1600929](#) 📄.
    - **AS ABAP 7.4 only:**
      - For more information about the SAP HANA database migration, check the Administrator's Guide for your SAP Business Suite application available at:
        - [https://help.sap.com/viewer/p/SAP\\_ERP\\_VERSION\\_FOR\\_SAP\\_HANA](https://help.sap.com/viewer/p/SAP_ERP_VERSION_FOR_SAP_HANA) ► ► [Operations](#) ► [Administrator's Guide](#) ►
        - [https://help.sap.com/viewer/p/SAP\\_CUSTOMER\\_RELATIONSHIP\\_MANAGEMENT\\_FOR\\_HANA](https://help.sap.com/viewer/p/SAP_CUSTOMER_RELATIONSHIP_MANAGEMENT_FOR_HANA) ► [Installation and Upgrade](#) ► [Administrator's Guide](#) ►
        - <https://help.sap.com/scm> ► ► [Operations](#) ► [Application Operations Guide](#) ►
        - <https://help.sap.com/srm> ► ► [Operations](#) ► [Application Operations Guide](#) ►
      - Perform the steps described in SAP Note [1851549](#) 📄.
10. Prepare the [media required for the export](#) [page 53]:
  - a. Prepare the software provisioning manager archive as described in [Downloading and Extracting the Software Provisioning Manager 1.0 Archive](#) [page 54].
  - b. If you want to use a dedicated kernel, you can specify this on the screen [Use Dedicated Kernel for System Copy](#) while performing the export. If you choose this option, you are prompted for the required kernel archives.  
  
For more information, see [Downloading Dedicated Kernel Archives for the Export](#) [page 56].
11. Check SAP Note [1410736](#) 📄 to avoid session timeout during the export or import procedure.

## 3.2 Product-Specific Preparations

### FI Customers

- You can perform an additional consistency check by running the job `SAPF190` before copying the source system, as well as after copying the target system, and then compare the results. Make sure that no customer data is changed in the meantime. You can do this as follows:

In transaction `SAPF190`, for classic FI, choose ► *Accounting* ► *Financial Accounting* ► *General ledger* ► *Periodic Processing* ► *Closing* ► *Check/count* ► *Reconciliation* ►.

For a new general ledger, choose ► *Accounting* ► *Financial Accounting* ► *General ledger* ► *Periodic Processing* ► *Closing* ► *Check/count* ► *Reconciliation (New)* ►.

- You can further check consistency by running the jobs listed below before copying the source system, as well as after copying the target system, and then compare the results.
  - `RFUMSV00` (tax on sales/purchases)
  - `RAGITT01` (asset history sheet)
  - `RAZUGA01` (asset acquisitions)
  - `RAABGA01` (fixed asset retirements)

Make sure that no customer data is changed in the meantime.

### CO Customers

You can perform an additional consistency check by running the report group `1SIP` before copying the source system, as well as after copying the target system, and then compare the results. Make sure that no customer data is changed in the meantime.

#### ⚠ Caution

Prerequisites for an export:

Before performing an export, make sure that no incremental conversion is in progress.

To test if an incremental conversion is in progress, run transaction `ICNV`. If there are any table entries in table `TICNV`, an incremental conversion is in progress. In this case, you have the following options:

- Defer the migration until the incremental conversion has finished.
- Try to finish the incremental conversion by performing the following steps:

- If the tables are in state `For conversion` or in state `Done`, delete the entries by choosing ► *Control* ► *Delete Entry* ►.
- If the tables are in any other state, you have to finish the incremental conversion. Choose *Assistant* and proceed according to the online documentation.



### Caution

#### Heterogeneous system copy only:

Before you start the export of your source system, make sure that the tables TATGPC and TATGPCA are empty. To do so, use your database utility and delete the contents of these tables with the following statements:

```
DELETE from TATGPC
```

```
DELETE from TATGPCA
```

If the tables are not empty and you do not delete the contents of these tables you encounter problems while importing the data to your target system because of non-NULL capable fields in these tables.

## SAP Business Warehouse

- When planning the copy of an SAP Business Warehouse (BW) system, read SAP Notes [886102](#) and [1707321](#).
- Especially if you want to perform a heterogeneous system copy to another database, make sure that all the data from the Persistent Staging Area (PSA) associated with a 7.X DataSource are extracted and loaded to the Data Targets using Data Transfer Process (DTP) before you perform the database migration. For more information, see SAP Note [2129192](#).
- For special preparations regarding the migration to SAP HANA database, see [Preparing the Migration to an SAP HANA Database \[page 49\]](#)

## 3.3 Preparing the Migration to SAP HANA Database

This section provides references to information about how to prepare the migration to SAP HANA database.


### i Note

**SAP Kernel Version 7.38 and higher:** Cluster and pool tables are made transparent during the migration to the SAP HANA database. Once you migrate to SAP HANA database, currently there is no automatic way to return back to your source database.

## Prerequisites






Apply SAP Note [1783937](#), so that partitioning restrictions are recognized when SQL files are created. Otherwise, the import of tables with more than 2 billion records will fail.

## Unicode Conversion




SAP HANA requires Unicode. Should you have a non-Unicode system, perform a Unicode conversion before the migration or plan a combined migration with Unicode conversion, which is technically also possible. Be aware that R3load requires significantly more CPU time with a combined Unicode conversion, resulting in a reduced number of configurable R3load jobs. For more information, see the *Unicode Conversion Overview Guide* available at: <https://blogs.sap.com/2009/04/08/unicode-conversion-overview-guide/> 


## Migration Tool Versions

Always use latest versions of the migration tools:

- R3\* tools (R3load, R3ldctl, R3szchk, R3ta or - if the SAP kernel version of the source system is 7.40 or higher - SAPuptool):
  - An up-to-date version of the load tools - such as R3load, R3szchk, R3ldctl, SAPuptool is available in the Software Provisioning Manager archive (SWPM10SP<Support\_Package\_Number>\_<Version\_Number>.SAR). They are automatically used by the software provisioning manager if you use Unicode kernel version 7.40 or higher. For more information, see [Downloading and Extracting the Software Provisioning Manager 1.0 Archive \[page 54\]](#).  
If you want to use the latest version of the tools contained in the kernel media, you can get them from: <https://launchpad.support.sap.com/#/softwarecenter>  **Support Packages and Patches** > **A - Z Index** > **K** > **SAP KERNEL** <VERSION><Release><Platform> .
  - For more information, see the blog *Migration to SAP HANA: SAP Kernel Update for the Migration* in the SAP Community Network at: <https://blogs.sap.com/2013/09/30/migration-to-sap-hana-sap-kernel-update-for-the-migration/> .
  - Verify that the versions are compatible. R3\* tools must fit the kernel version of your SAP system.
- SAPCAR:  
You can get the latest version from the tools from: <https://launchpad.support.sap.com/#/softwarecenter>  **Support Packages and Patches** > **A - Z Index** > **S** > **SAPCAR** .

## Kernel

Use the latest kernel media for the software provisioning manager as listed in SAP Note [1680045](#)  ( **Release Note for software provisioning manager 1.0** > **Kernel media for SWPM\*** ). Make sure to use the same kernel version both for export and import. For more information, see [General Technical Preparations \[page 45\]](#).

For more information about release and roadmap information around the kernel versions and their relationship to SAP NetWeaver support packages including important notes on downward compatibility and release dates, see the document *Understanding Kernel Releases for the SAP NetWeaver AS ABAP* at: <https://archive.sap.com/documents/docs/DOC-54170> .

## Creating DDL Statements

Before you start the export, make sure to run the report SMIGR\_CREATE\_DDL that generates DDL statements for the migration.

For more information, see [Generating DDL Statements \[page 66\]](#).

## Table Splitting Preparation

For more information about how to prepare table splitting, see [Preparing the Table Split \[page 69\]](#)





## Package Splitting

Package splitting is activated by default. Do not deactivate it.


For more information about how to prepare table splitting, see [Preparing the Package Split \[page 74\]](#)


## Housekeeping

Before the migration, delete and archive obsolete data from tables that show the largest growth in data volume. For more information, see:

- The *Data Management Guide for SAP Business Suite* available in SAP Service Marketplace at: <https://support.sap.com/en/solution-manager/processes-72.html>  [Processes](#)  [Data Volume Management](#) 
- SAP Note [679456](#)  (*Reducing data volume before Unicode conversion*).

If not instructed otherwise, carry out the corresponding activities to reduce the data volume during system uptime.

Implement SAP Note [1659622](#)  in the source system. It provides the ABAP report SMIGR\_BIG\_ROW\_STORE\_TABS. This report can be used to identify large tables that will be stored as row store tables in SAP HANA. A small memory footprint of the row store is beneficial to minimize the database startup time.

Especially for SAP Business Warehouse (SAP BW), you can profit from an automated housekeeping, offered as task list of the ABAP task manager for lifecycle management automation. For more information, see SAP Note [1829728](#)  (*BW Housekeeping Task List*).

## Further Preparations

- Read SAP Note [1775293](#) (Migration/system copy to SAP HANA using the latest SWPM 1.0)

### i Note

If you want to get automatic notifications about changes to this SAP Note, you can configure to receive email notifications on this page in SAP Community Network.

- `R3SZCHK` calculates space requirements on the target database for ABAP tables and indexes and rough estimation of overall size for target database. Per default, `R3SZCHK` gets executed by the software provisioning manager. The result is an `EXT` and a `DBSIZE.XML` file.

### i Note

If the target database is SAP HANA, the `DBSIZE.XML` file is not used as the sizing is done already by SAP's sizing tools for SAP HANA.

If `R3SZCHK` is very slow, check SAP Note [1047369](#).

- Request or generate a migration key. For more information, see <https://support.sap.com/en/my-support/keys.html>.
- Before the export, run the reports `SDBI_CLUSTER_CHECK_PERFORM` and `SDBI_CHECK_BCD_NUMBERS`. This avoids issues during the export and import because of corrupt or initial cluster records or decimal numbers. For more information, see SAP Note [1784377](#) (Checking pool tables and cluster tables).
- Avoid more than one statistics server for your SAP HANA database. Otherwise, the import step can fail because of a "standby" statistics server. Remove any configured standby statistics servers before the import.
- Perform a test run of the system copy procedure to calculate downtimes of your source system based on experiences made during the test run. Adapt the general process to your system and environment. For more information, see [Creating A System Copy Plan \[page 27\]](#).
- Order and install a new SAP license. For more information, see [Various Planning Aspects and Parameters \[page 28\]](#).
- Prepare the source system as described in [General Technical Preparations \[page 45\]](#) and [Product-Specific Preparations \[page 48\]](#). For example, check for canceled or pending update requests and operation mode

## SAP Business Suite Applications

For more information about the overall migration process, see SAP Note [1785057](#).

To ensure a successful migration, you should perform the following preparation steps:

1. If there are tables with high data volume in your source database where the number of records exceeds a certain limit, partitioning of these tables in your SAP HANA database is required. For more information, see SAP Note [1783937](#).
2. Note that for both SAP tables and customer tables, cluster tables will be automatically transformed into transparent tables during the migration. Also pool tables will be converted into transparent tables. For more information about which pool tables are converted into transparent tables and when, see SAP Note [1785057](#).

To verify that this transformation will work properly during the migration, the source database should be checked. For more information, see SAP Note [1784377](#).

For example, cluster or pool tables that contain invalid values cannot be migrated.

Check if there is custom code (customer development) in your system that can directly access tables that can be resolved. Such code is no longer valid.

Note that applications may not rely on implicit sorting of result sets of accesses to former pool and cluster tables that have been transformed to transparent tables. For more information, see SAP Note [1785057](#).

## SAP Business Warehouse

- Perform the preparation steps described at:
  - The document *Best Practice Guide - Classical Migration of SAP NetWeaver AS ABAP to SAP HANA* available at: <https://archive.sap.com/documents/docs/DOC-47657>
  - <https://blogs.sap.com/2016/10/11/software-application-lifecycle-management-sap-bw/>
  - [https://rapid.sap.com/bp/#/RDS\\_RDBMS\\_4\\_BW](https://rapid.sap.com/bp/#/RDS_RDBMS_4_BW) ► *Solution Deployment: Configuration Guide of the SAP Rapid Deployment Solution "Rapid Database Migration of SAP NetWeaver BW to SAP HANA"*
- Perform the preparation steps described in SAP Note [1600929](#).

## 3.4 Preparing the Media Required for Performing the Export

For performing the **export on the source system**, you only need to download and extract the software provisioning manager 1.0 archive which contains the software provisioning manager.

For the media required for performing the **target system installation**, see section *Preparing the installation Media* in the [installation guide \[page 22\]](#) for the operating system platform and database of your target system.

### [Downloading and Extracting the Software Provisioning Manager 1.0 Archive \[page 54\]](#)

You must always download and extract the software provisioning manager 1.0 archive from the SAP Software Download Center because you must use the latest version.

### [Downloading Dedicated Kernel Archives for the Export \[page 56\]](#)

If you want to use a dedicated kernel for the database export, you must download the `SAPEXE.SAR` and `SAPEXEDB.SAR` for your operating system, kernel release and database beforehand.

## 3.4.1 Downloading and Extracting the Software Provisioning Manager 1.0 Archive

You must always download and extract the software provisioning manager 1.0 archive from the SAP Software Download Center because you must use the latest version.







### Prerequisites

- Make sure that you are logged on as a user with `root` authorizations, and that the download directory has at least the permissions 755.
- Make sure that you use the **latest** version of the `SAPCAR` tool when manually extracting the software provisioning manager archive. You need the `SAPCAR` tool to be able to unpack and verify software component archives (\*.SAR files). \*.SAR is the format of software lifecycle media and tools that you can download from the SAP Software Download Center.

#### Note

An older `SAPCAR` version might extract archive files in a wrong way and this could prevent the software provisioning manager from working consistently.

Proceed as follows to get the latest version of the `SAPCAR` tool:

1. Go to <https://launchpad.support.sap.com/#/softwarecenter>  [SUPPORT PACKAGES & PATCHES](#)  [By Category](#)  [SAP TECHNOLOGY COMPONENTS](#)  [SAPCAR](#) .
2. Select the `SAPCAR` for your operating system and download it to an empty directory.
3. Even if you have the latest `SAPCAR` already available, we strongly recommend that you verify its digital signature anyway, unless you downloaded it directly from <https://launchpad.support.sap.com/#/softwarecenter>  yourself. You can do this by verifying the checksum of the downloaded `SAPCAR` tool:
  1. Depending on what operating system you are using, compute a hash of the downloaded `SAPCAR` tool, using the SHA-256 algorithm used by SAP.
  2. Now verify the digital signature of the downloaded `SAPCAR` tool by comparing the hash with the checksum (generated by SAP using the SHA-256 algorithm) from the [Content Info](#) button in the [Related Info](#) column on the right-hand side of the place where you downloaded the `SAPCAR` tool.
4. To improve usability, we recommend that you rename the executable to `sapcar`.

For more information about `SAPCAR`, see SAP Note [212876](#) .

### Context

An up-to-date version of the load tools - such as `R3load`, `R3szchk`, `R3ldctl`, `SAPuption` - which were available so far only in the `SAPEXEDB_<...>.SAR` archive of the kernel media, has now been made available in the software provisioning manager archive (`software provisioning manager10SP<Support_Package_Number>_<Version_Number>.SAR`), in a sub-archive named `LOADTOOLS.SAR`, located in the `COMMON/LOADTOOLS` folder. For a system copy

using kernel version 7.40 or higher, the load tools from the software provisioning manager10SP<Support\_Package\_Number>\_<Version\_Number>.SAR are used **automatically** instead of the loadtools available in the SAPEXEDB\_<...>.SAR archive of the kernel media. **There is no action required from your side**, the software provisioning manager uses the relevant loadtools automatically once you run it from the extracted software provisioning manager10SP<Support\_Package\_Number>\_<Version\_Number>.SAR archive. For more information, see SAP Note [2472835](#).

## Procedure

1. Download the latest version of the Software Provisioning Manager 1.0 archive SWPM10SP<Support\_Package\_Number>\_<Version\_Number>.SAR from:
 

<https://support.sap.com/sltoolset> > System Provisioning > Download Software Provisioning Manager
2. Using the latest version of SAPCAR, you can verify the digital signature of the downloaded SWPM10SP<Support\_Package\_Number>\_<Version\_Number>.SAR archive as follows:
  - a. Get the latest version of the SAPCRYPTOLIB archive to your installation host as follows:
    1. Go to <https://launchpad.support.sap.com/#/softwarecenter> SUPPORT PACKAGES & PATCHES and search for "sapcryptolib".
    2. Select the archive file for your operating system and download it to the same directory where you have put the SAPCAR executable.
    3. Use the following command to extract the SAPCRYPTOLIB archive to the same directory where you have put the SAPCAR executable:
 

```
SAPCAR -xvf sapcryptolibp_84...sar -R <target directory>
```
    4. Download the Certificate Revocation List from <https://tcs.mysap.com/crl/crlbag.p7s> and move it to the same directory.
  - b. Verify the digital signature of the downloaded SWPM10SP<Support\_Package\_Number>\_<Version\_Number>.SAR archive by executing the following command:

### Note

Check SAP Notes [2178665](#) and [1680045](#) whether additional information is available.

```
/<Path to SAPCAR>/SAPCAR -tvVf <Path to Download Directory>/
SWPM10SP<Support_Package_Number>_<Version_Number>.SAR -crl<file name of
revocation list>
```

3. Unpack the Software Provisioning Manager archive to a local directory using the following command:

```
/<Path to SAPCAR>/sapcar -xvf <Path to Download Directory>/
SWPM10SP<Support_Package_Number>_<Version_Number>.SAR -R <Path to Unpack
Directory>
```

### Note

Make sure that all users have at least read permissions for the directory to which you unpack the Software Provisioning Manager archive.

#### ⚠ Caution

Make sure that you unpack the Software Provisioning Manager archive to a dedicated folder. Do not unpack it to the same folder as other installation media.

## 3.4.2 Downloading Dedicated Kernel Archives for the Export

If you want to use a dedicated kernel for the database export, you must download the `SAPEXE.SAR` and `SAPEXEDB.SAR` for your operating system, kernel release and database beforehand.

### Context

Using this feature, you no longer have to do kernel updates in your systems just for the purpose of being able to copy it. Instead, the software provisioning manager provides you the option to use a different kernel just for the purpose of system copy. This means you do not provide a kernel to be installed but only to be used by the software provisioning manager for performing the export. For this option, you have to provide a separately downloaded `SAPEXEDB.SAR` and `SAPEXE.SAR` archive.

#### i Note

The digital signature of **installation archives** is checked **automatically** by the [software provisioning manager \[page 81\]](#) during the [Define Parameters](#) phase while processing the [Software Package Browser](#) screens. The software provisioning manager only accepts archives whose digital signature has been checked. After scanning the archives and verifying the digital signature, an info file is written where you can find detailed information about matching and non-matching archive files. You can access this info file by choosing the [info file](#) link in the Archive Scanning Result section of the [Software Package Browser](#) screen. The info file contains only the results of the latest archive scan.

### Procedure

1. Go to <https://launchpad.support.sap.com/#/softwarecenter/> ➤ [Software Downloads](#) ➤ [SUPPORT PACKAGES & PATCHES](#) ➤ [By Category](#) ➤ [Additional Components](#) ➤ [SAP Kernel](#) ➤ [<Version>](#) ➤
2. Choose the required package:

#### ⚠ Caution

- Make sure that you always choose `SAPEXE<Version>.SAR`, `SAPEXEDB<Version>.SAR` of the **same** SAP kernel release and extension:

#### ❖ Example

- If `SAPEXE<Version>.SAR` is of version **7.42 EXT**, then `SAPEXEDB<Version>.SAR` must also be of version **7.42 EXT**.



- If `SAPKEXE<Version>.SAR` is of version **7.45**, then `SAPKEXEDB<Version>.SAR` must also be of version **7.45**.

- `SAPKEXE<Version>.SAR`

► `SAP KERNEL <Version> <UC | NUC>` ► `<Operating System>` ► `#DATABASE INDEPENDENT` ►

#### i Note

`SAP KERNEL <Version> <NUC>` is only available for SAP systems based on SAP NetWeaver 7.4 or lower

- If you want to install an SAP system based on SAP NetWeaver 7.5, you can only choose 7.45 UNICODE for `SAP KERNEL <Version>`.
- If you want to install an SAP system based on SAP NetWeaver 7.4, you can choose either 7.45 or 7.42 for `SAP KERNEL <Version>`.
- If you want to install an SAP system based on SAP NetWeaver 7.3 including EHP1, choose 7.22 EXT for `SAP KERNEL <Version>`

- `SAPKEXEDB<Version>.SAR`

► `SAP KERNEL <Version> <UC | NUC>` ► `<Operating System>` ► `#DATABASE INDEPENDENT` ►

#### i Note

`SAP KERNEL <Version> <NUC>` is only available for SAP systems based on SAP NetWeaver 7.4 or lower

- If you want to install an SAP system based on SAP NetWeaver 7.5, you can only choose 7.45 UNICODE for `SAP KERNEL <Version>`.
- If you want to install an SAP system based on SAP NetWeaver 7.4, you can choose either 7.45 or 7.42 for `SAP KERNEL <Version>`.
- If you want to install an SAP system based on SAP NetWeaver 7.3 including EHP1 or lower, choose 7.22 EXT for `SAP KERNEL <Version>`

## 4 Database Independent System Copy

With the software provisioning manager, you can export and import your database content in a database-independent format. The software provisioning manager uses the R3load tool for exporting and importing the database content.

R3load generates a database export of all SAP objects that are defined in the ABAP Dictionary, including the configuration and components in the file system.

### i Note

Make sure that you have the most recent version of the R3load tool, which you can download from <https://launchpad.support.sap.com/#/softwarecenter>.

An up-to-date version of the load tools - such as R3load, R3szchk, R3ldctl, SAPuption - which were available so far only in the SAPEXEDB\_<...>.SAR archive of the kernel media, has now been made available in the software provisioning manager archive (software provisioning manager10SP<Support\_Package\_Number>\_<Version\_Number>.SAR), in a sub-archive named LOADTOOLS.SAR, located in the COMMON/LOADTOOLS folder. For a system copy using kernel version 7.40 or higher, the load tools from the software provisioning manager10SP<Support\_Package\_Number>\_<Version\_Number>.SAR are used **automatically** instead of the loadtools available in the SAPEXEDB\_<...>.SAR archive of the kernel media. **There is no action required from your side**, the software provisioning manager uses the relevant loadtools automatically once you run it from the extracted software provisioning manager10SP<Support\_Package\_Number>\_<Version\_Number>.SAR archive. For more information, see SAP Note [2472835](#).

### i Note

Declustering / depooling of ABAP tables is supported for SAP systems based on SAP NetWeaver 7.4 SP03 and higher. For more information, SAP Note [1892354](#).

## Constraints

### R3load Restrictions

- The software provisioning manager generates a database dump of all SAP objects that are defined in the ABAP Dictionary (R3load). Other objects are not exported by the software provisioning manager.
- For a consistent database export, no transactions on export-relevant database objects are allowed during the export. Otherwise, the export has to be restarted. Therefore, we recommend that you shut down the SAP system (excluding the database!) for the export. The database must still be running.
- Changes to database objects that cannot be maintained in the ABAP Dictionary (transaction [SE14](#)), such as the distribution of tables over several tablespaces or dbspaces, are lost after the system copy.
- Indexes longer than 18 characters are not allowed on the database to be exported.

## Multiple Applications in SAP HANA Systems

For more information about multiple applications in SAP HANA systems, see SAP Notes [1826100](#) and [1661202](#).

If the database configuration of your database is stored in the file system, we recommend you to back up these configuration files before deleting the database.

### Splitting STR Files

- During the standard system copy process, all tables of the SAP system are grouped into packages, whereby all tables with the same data class belong to the same package. The processing unit for one unload/load process is a package. The packages differ in number and size of contained tables, resulting in varying unload/load runtimes. The overall runtime can be reduced by creating packages of the same size, that is, creating packages with a similar processing time. You can achieve this by splitting the default packages (one package per data class) into more and smaller pieces.
- There are several options of how to split packages. For a detailed description of the options, see the [F1](#) help about the parameters prompted on the *Split STR Files* screen while running the software provisioning manager to export the database. The options can be used separately or – when using the new Java based splitting tool – combined.
- “Splitting of STR Files” is part of the “Advanced Export Parameters” and is enabled by default. If you select the splitting option (if you did not already perform some tests before), using the splitting tool parameters selected by the software provisioning manager is a good starting point.

#### ⚠ Caution

If you want to split STR files, you **must** first create the EXT files for the target database system. You can find the EXT files in your export dump directory, subdirectory DB/<DBTYPE>, for example DB/ORA.

## 4.1 System Copy Procedure

This section describes the system copy procedure using R3load.

### Prerequisites

Specify an **empty** directory with sufficient disk space for the export dump on the host where you want to perform the export. Make sure that this directory does not contain any files from any previous system copy exports. If you cancelled a system copy export and want to perform the export again, make sure that you remove all files from the previously cancelled export before you start the export from scratch.

#### i Note

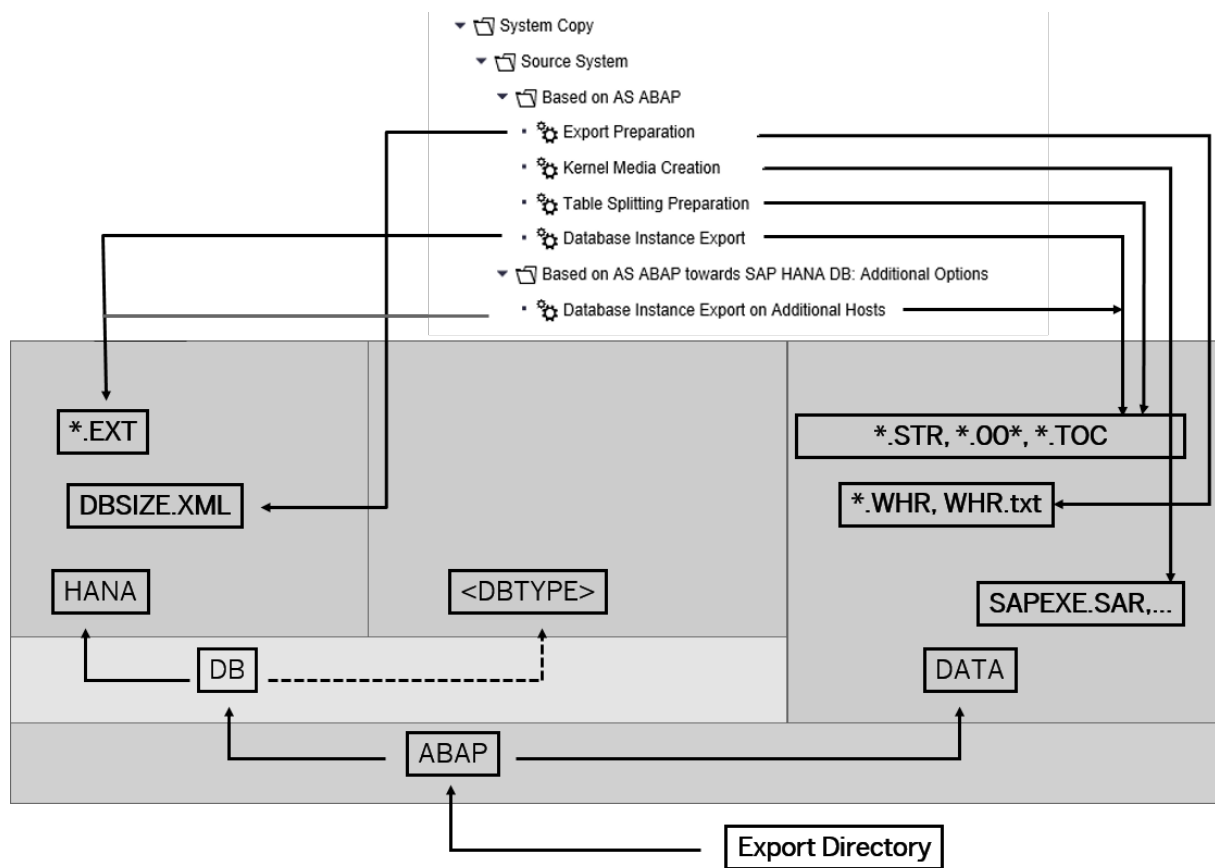
As a result of the export, a dump of the database schema belonging to the SAP system is stored in the export directory. During the entire life-cycle of this export dump, you must ensure adequate protection from unauthorized read access and modification of the data exported. Therefore, you now have the option to specify a restricted access level for the export directory when you [run the software provisioning manager](#)

[page 81] to perform the export. You are enabled to specify that only the `<sapsid>adm` executing the export has permission to read and modify the database export.

## Process Flow on the Source System (Export)

When performing the export, the software provisioning manager creates a migration export media which contains the data of the exported system, and which you use to install the target system.

The following figure shows the export options and the resulting output files.



Overview on Export Options

Follow the sequence of steps described below for a:

- Standard system
  - Standard system – Performing the Export on the Source System
  - Standard system – Setting Up the Target System
- Distributed system or high-availability system
  - Distributed system or high-availability system – Performing the Export on the Source System
  - Distributed system or high-availability system – Setting Up the Target System

## Standard System – Performing the Export on the Source System

To perform the export for a standard system, proceed as follows on the standard system host:

1. **Heterogeneous system copy only:** Generate the migration key at <https://support.sap.com/migrationkey>, entering the installation number of your source system when prompted.
2. Perform the export on the **standard system host**:
  1. Make sure that the QCM tables are deleted from your system as described in [General Technical Preparations \[page 45\]](#).
  2. [Generate DDL statements \[page 66\]](#).
  3. [Prepare the system for table splitting \[page 69\]](#) (optional).
  4. You [run the software provisioning manager \[page 81\]](#) to prepare the source system for the export. On the *Welcome* screen, choose the *Export Preparation* option.

### i Note

You must run this option if you want to perform export processes in parallel with import processes during the system copy. Otherwise, this step is optional.

5. If required, you [prepare parallel export and import \[page 75\]](#).
6. [Start the software provisioning manager \[page 81\]](#) from an application server instance host to export the database instance.

### i Note

If you want to run a system copy with parallel export/import using the migration monitor with the R3load socket option, and the target database is declustered, start the software provisioning manager with command line option **SUPPORT\_DECLUSTERING=false**.

On the *Welcome* screen, choose option *Database Instance Export*.

### i Note

- If parallel export and import has been prepared, ensure the following:
  - You choose *Parallel Export and Import* for the database instance ABAP export on the *SAP System Database Export* screen.
  - If you decided to transfer the export directory instead of sharing it to the target host, make sure that you transfer it while you are processing the *Database Instance Export* option, after you have stopped the source system and before you proceed with the export procedure.
- If table splitting for ABAP tables has been prepared before the data export via the software provisioning manager, the software provisioning manager export automatically does the following:
  - It forces package splitting.
  - It forces the use of an input file for table splitting.
  - It uses the existing `whr.txt` file from the dump directory for the package splitter.

You only have to execute the following steps if you intend to [run the export on additional hosts \[page 44\]](#):

1. If you want to use additional hosts for the export, you have to mark the *Use Additional Export Hosts* checkbox on the *SAP System Database Export* screen.

Some additional screens now appear where you can specify the additional hosts on which you intend to run the export and the size of the packages each export run is to contribute to the complete export dump.

2. Follow the instructions on these screens and then finalize the export on the database instance host.

#### **i Note**

The total number of jobs should only be the number of jobs which are processed on the current host.

As a result, the first part of the export dump is created in the export directory.

3. Mount the export directory on each of the additional hosts on which you want to perform the export.  
In addition, you have to mount the `SGN` (signal) directory if you run the export/import in parallel. For more information about the `SGN` directory, see the documentation of the `netExchangeDir` option in the [migration monitor Configuration \[page 135\]](#) documentation.
4. [Run the software provisioning manager \[page 81\]](#) on each of the additional hosts on which you want to perform the export.  
On the *Welcome* screen, choose the system copy option *Database Instance Export on Additional Hosts*.  
Follow the instructions on the screens and finalize the export on the additional hosts.

#### **i Note**

If `R3load` processes fail due to an error, solve the problem, and perform the restart as described in [Restarting R3load Processes \[page 100\]](#).

3. If you want to perform [table comparison with Software Update Manager \(SUM\) \[page 163\]](#), proceed as follows:
  1. Stop all instances of the source system once the export has completed.
  2. [Run table comparison \[page 165\]](#) for the source system.
  3. You can restart the instances of the source system.

## Standard System – Setting Up the Target System

You use the software provisioning manager to set up the target system and import the database files that you have exported from the source system.

#### **i Note**


This system copy guide describes only the **source system export** in full detail. As for the installation of the **target system**, this system copy guide describes only the system copy-specific steps in section [Setting Up the Target System \[page 101\]](#), but refers for all steps that are identical with a new system installation to the appropriate operating system and database-specific [installation guide \[page 22\]](#).

You perform the following steps on the **standard system host**:

#### **i** Note

The SAP HANA database is part of the SAP HANA appliance. It is pre-installed by SAP partners before the installation of your SAP system. Therefore, the SAP HANA database instance always runs on a separate host, even if your SAP system is a standard system.

Only valid for 'Platform': Linux


As of Software provisioning manager 1.0 SP06 (SL Toolset 1.0 SP11), you can also install SAP systems based on Application Server ABAP **same host** as the SAP HANA database, without applying additional environment settings. For more information, see SAP Note [1953429](#) .

End of 'Platform': Linux

1. You prepare the standard system host for the installation of your target system as described in the installation guide.
2. If you have already [prepared the export \[page 75\]](#) on the source system because you want to perform **export processes in parallel to import processes**, you perform the following steps:
  1. If you use the *FTP Exchange* option during the export (transfer type *FTP* on the *SAP System Data Transfer Parameters for Export* screen and communication type *Exchange Directory* on the *SAP System Communication Parameters for Export* screen), make sure that you have transferred all files that have been generated in step [Preparing Parallel Export and Import \[page 75\]](#) on the source system.
  2. You [transfer the export files to the standard system target host \[page 102\]](#).
  3. You [install the target system \[page 103\]](#).If you did **not** prepare the export on the source system, you install the target system.  
For more information, see [Installing the Target System \[page 103\]](#)
3. If required, on the **host or hosts of the application server instance**, you install further **additional application server instances** as described in the installation guide.

## Distributed System or High-Availability System – Performing the Export on the Source System

To perform the export for a **distributed system** or a **high-availability system**, proceed as follows:

1. **Heterogeneous system copy only:** Generate the migration key at <https://support.sap.com/migrationkey> , entering the installation number of your source system when prompted.
2. You perform the database instance export.  
We recommend that you perform this step on the database instance host. If your source database is SAP HANA, you perform this step on any application server instance host.
  1. Make sure that the QCM tables are deleted from your system as described in [General Technical Preparations \[page 45\]](#).
  2. [Generate DDL statements \[page 66\]](#).
  3. You [run the software provisioning manager \[page 81\]](#) to prepare the source system for the export.  
On the *Welcome* screen, choose the *Export Preparation* option.

#### **i** Note

You must run this option if you want to perform export processes in parallel with import processes during the system copy. Otherwise, this step is optional.

4. [Prepare the system for table splitting \[page 69\]](#) (optional).
5. If required, you [prepare parallel export and import \[page 75\]](#).
6. [Run the software provisioning manager \[page 81\]](#) to export the database instance.

### i Note

If you want to run a system copy with parallel export/import using the migration monitor with the R3load socket option, and the target database is declustered, start the software provisioning manager with command line option **SUPPORT\_DECLUSTERING=false**.

On the [Welcome](#) screen, choose the system copy option [Database Instance Export](#).

### i Note

- If parallel export and import has been prepared, ensure the following:
  - You choose [Parallel Export and Import](#) for the database instance ABAP export on the [SAP System Database Export](#) screen.
  - If you decided to transfer the export directory instead of sharing it to the target host, make sure that you transfer it while you are processing the [Database Instance Export](#) option, after you have stopped the source system and before you proceed with the export procedure.
- If table splitting for ABAP tables has been prepared before the data export via the software provisioning manager, the software provisioning manager export automatically does the following:
  - It forces package splitting.
  - It forces the use of an input file for table splitting.
  - It uses the existing `whr.txt` file from the dump directory as default for the package splitter input file.

You only have to perform the following steps if you intend to [run the export on additional hosts \[page 44\]](#):

1. If you want to use additional hosts for the export, you have to mark the [Use Additional Export Hosts](#) check box on the [SAP System Database Export](#) screen.  
Some additional screens now appear where you can specify the additional hosts on which you intend to run the export and the size of the packages each export run is to contribute to the complete export dump.
2. Follow the instructions on these screens and then finalize the export on the database instance host.

### i Note

The total number of jobs should only be the number of jobs which are processed on the current host.

As a result, the first part of the export dump is created in the export directory.

3. Mount the export directory on each of the additional hosts on which you want to perform the export.  
In addition, you have to mount the `SGN` (signal) directory if you run the export/import in parallel. For more information about the `SGN` directory, see the documentation of the `netExchangeDir` option in the [migration monitor Configuration \[page 135\]](#) documentation.



4. [Run the software provisioning manager \[page 81\]](#) on each of the additional hosts on which you want to perform the export.  
On the *Welcome* screen, choose the system copy option *Database Instance Export on Additional Hosts*.  
Follow the instructions on the screens and finalize the export on the additional hosts.

#### **i Note**

If R3load processes fail due to an error, solve the problem, and perform the restart as described in [Restarting R3load Processes \[page 100\]](#).

3. If you want to perform [table comparison with the Software Update Manager \(SUM\) \[page 163\]](#), proceed as follows:
  1. Stop all instances of the source system once the export has completed.
  2. [Run table comparison \[page 165\]](#) for the source system.
  3. You can restart the instances of the source system.

## **Distributed System or High-Availability System – Setting Up the Target System**

You use the software provisioning manager to set up the target system and import the database files that you have exported from the source system.

#### **i Note**

This system copy guide describes only the **source system export** in full detail. As for the installation of the **target system**, this system copy guide describes only the system copy-specific steps in section [Setting Up the Target System \[page 101\]](#), but refers for all steps that are identical with a new system installation to the appropriate operating system and database-specific [installation guide \[page 22\]](#).

In the following, we refer to this guide as “installation guide”.

Perform the following steps on the relevant installation hosts of your target system:

1. You prepare the **ASCS instance host**, the **database instance host**, and the **host of the primary application server instance** for the installation of the corresponding instances of your target system as described in the installation guide.
2. You install the **ASCS instance** for the target system as described in the installation guide.
3. You perform the following steps from any **application server instance host**:
  - If you have already [prepared the export \[page 75\]](#) on the source system because you want to perform **export processes in parallel to import processes**, you perform the following steps:
    1. If you use the *FTP Exchange* option during the export (transfer type *FTP* on the *SAP System Data Transfer Parameters for Export* screen and communication type *Exchange Directory* on the *SAP System Communication Parameters for Export* screen), make sure that you have transferred the files, which have been generated in step [Preparing Parallel Export and Import \[page 75\]](#) on the source system.

#### **→ Recommendation**

Use different network exchange directories for the ABAP and Java stack in the configuration phase of the parallel export/import. Otherwise, both migration monitor and Java migration

monitor might fail at the beginning of the import, if the exchange directory of the respective tool contains signal files (\*.SGN) from the respective tool of the other stack. For more information, see SAP Note [2742371](#).

2. You [transfer the export files to the database instance target host \[page 102\]](#).
3. You install the database instance of the target system.  
For more information, see [Installing the Target System \[page 103\]](#).
- If you did **not** prepare the export on the source system, you install the database instance of the target system.
  - You [transfer the export files to the database instance target host \[page 102\]](#).
  - You install the database instance of the target system.  
For more information, see [Installing the Target System \[page 103\]](#).

#### ⚠ Caution

Note that after completing the **>> <Product> > <Database> > System Copy > Target System > <System\_Variant> > Based on AS ABAP > Database Instance** option, you must subsequently run the **>> <Product> > <Database> > System Copy > Target System > <System\_Variant> > Based on AS ABAP > Primary Application Server Instance** option as well. Otherwise you run the risk that the installed system is in an inconsistent state, because if you do not run the **>> <Product> > <Database> > System Copy > Target System > <System\_Variant> > Based on AS ABAP > Primary Application Server Instance** option, some mandatory ABAP reports that are integrated in this option have not been executed in the primary application server instance.

4. On the **host of the primary application server instance**, you install the primary application server instance of the target system.
5. If required, on the **host or hosts of the additional application server instance**, you install further additional application server instances as described in the installation guide.

## 4.1.1 Generating DDL Statements

To migrate nonstandard database objects, you need to generate DDL statements using the ABAP report SMIGR\_CREATE\_DDL.

### Prerequisites

- **Only valid for SAP systems based on SAP NetWeaver 7.4 on SAP HANA (not for SAP BW 7.3 EHP1 and SAP BW 7.4):** If you want to migrate your system to a distributed SAP HANA database, make sure that you also consider the prerequisites as listed in SAP Note [1781986](#) (*Business Suite on SAP HANA Scale Out*), such as running report SHDB\_GROUP\_TABLES\_LOAD\_BASED in order to classify tables in the context of the migration. You must execute the report before the migration, in particular before running report SMIGR\_CREATE\_DDL.
- In addition, make sure that you applied all SAP Notes referenced in SAP Note [1921023](#) in the source system. Especially for migrations to SAP BW on SAP HANA, also apply the SAP Notes listed in the

attachment `REQUIRED_CORRECTION_NOTES.TXT` of SAP Note [1908075](#). These SAP Notes contain corrections and enhancements to `SMIGR_CREATE_DDL`, such as:

- Rowstore list:
  - For SAP systems based on SAP NetWeaver 7.3 EHP1, the file `rowstorelist.txt` is used to distinguish between row-store and column-store packages, which can get created via an additional option of the report `SMIGR_CREATE_DDL`.
  - For SAP systems based on SAP NetWeaver 7.4, corresponding information is stored in `DDIC` instead of `rowstorelist.txt`, so no action is required.
- Table list with estimated record count:
  - `SMIGR_CREATE_DDL` creates a file `HDB_ESTIMATES.TXT` or `ESTIMATED_ROW_COUNT.TXT` that contains a list of all relevant tables and the estimated number of rows per table. This information is used during migration into scale-out systems after the initial table creation and before the actual load of data. At that point, the software provisioning manager performs an initial landscape redistribution of the empty tables. The estimated record counts are used in this step to ensure an equal distribution of data across the index server slave nodes.
  - The blog *SAP HANA Landscape Redistribution with SP6* at <http://scn.sap.com/community/hana-in-memory/blog/2013/09/03/sap-hana-landscape-redistribution-with-sp6> provides additional information on table placement and landscape redistribution.
- For migrations into scale-out systems:
  - Follow the recommendations provided in SAP Note [1908075](#) (*set database parameters, maintain entries in control table for table placement, grant authorizations*).
  - Check SAP Note [1958216](#) (*HANA landscape redistribution configuration*) for revision-specific parameter settings.
- For partitioning, make sure that SAP Note [1783937](#) (`SMIGR_CREATE_DDL` Enhancement for Suite on HANA) is applied, so that partitioning restrictions are recognized when SQL files are created (that is, large tables get partitioned during the migration). Otherwise, the import of tables with more than 2 billion records (German: 2 Mrd.) will fail.
- If you want to migrate an SAP Business Suite system to a distributed SAP HANA database, see SAP Note [1899817](#) (*Suite on distributed HANA database - table redistribution*).

## Context

- You must perform this procedure **before** starting the software provisioning manager.
- Always run `SMIGR_CREATE_DDL` before performing a heterogeneous system copy with SAP HANA as target database. `SMIGR_CREATE_DDL` checks the size of any table and generates corresponding DDL statements with partitioning clause for very big tables. In an SAP HANA database, all tables with more than two billions of records must be partitioned.
- For additional database-specific information, see also SAP Note [888210](#).

## Procedure

1. Log on to the system as a system administrator in a productive client.

2. Call transaction SE38 and run the program *SMIGR\_CREATE\_DDL*.

The *Report SMIGR\_CREATE\_DDL: Generate DDL Statements for Migration* screen appears.

3. Specify the required parameters on the *Report SMIGR\_CREATE\_DDL: Generate DDL Statements for Migration* screen.

- Select the *Target Database*. Depending on the database manufacturer, you might need to select the database version. The value help supports you in selecting the database version.

#### **i Note**

This parameter is not relevant for SAP HANA.

- *Additional Parameters:*

- *Unicode Migration:* This checkbox should be enabled if the target system is a Unicode system. For SAP systems based on SAP NetWeaver 7.5 or higher, this checkbox is always enabled and is not changeable any longer.
- *Installation Directory:* Specify a directory to which the generated files are to be written.

- *Optional Parameters:*

The parameters *Table Category* and *Table Name* are used to limit the amount of tables to be processed in SMIGR\_CREATE\_DDL. These parameters are for test purposes only.

- *SAP HANA Options:*

- *Table Classification:*  
If you mark this checkbox, the table attributes GROUP NAME, GROUP TYPE, and SUBTYPE will be set for BW tables. You should always mark this checkbox if the target system is an SAP BW Scale Out system.
- *Estimated Table Size:*  
If you mark this checkbox, the files HDB\_ESTIMATES.TXT and/or ESTIMATED\_ROW\_COUNT.TXT will be generated. These files contain information about table sizes. They are necessary if the target system is an SAP BW Scale Out system.
- *SAP Business Suite on SAP HANA:*  
Do **not** use this option. Instead, refer to SAP Note [2408419](#) and the attached documentation for SAP Business Suite migration to an SAP HANA Scale Out system.
- *Extended Storage in Target Sys :*  
This checkbox is intended for SAP BW system where Dynamic Tiering - formerly known as "Extended Storage" - with Sybase IQ is enabled.  
Mark this checkbox if Dynamic Tiering with Sybase IQ is also configured in the target system.  
For more information about SAP HANA Scale Out, see the SAP HANA documentation at [https://help.sap.com/hana\\_platform](https://help.sap.com/hana_platform)

4. Execute the program.

The DDL statements are generated and are written to the specified directory.

#### **i Note**

Ensure that the user `<sapsid>adm` of the **source system** has **write** access and the user `<sapsid>adm` of the **target system** has **read** access to the directory with the generated SQL files.

From there, the software provisioning manager copies them to the `<Export_Dump_Directory>/ABAP/DB` export directory.

#### Caution

If **no** database-specific objects exist in the database, no SQL files will be generated. As long as the report terminates with status *Successfully*, this is **not** an error.

If database-specific objects exist without being assigned to a specific TABART in the ABAP dictionary (table DD09L), the object definition is written to SMIGR.SQL, otherwise to <TABART>.SQL. R3load handles all SQL files automatically during the import.

## 4.1.2 Using a Dedicated Kernel for the Export

As a customer running a productive system, you are sometimes confronted with kernel patches that are required for an ABAP system copy. Since you do not want to change the kernel for your productive landscape, you would like to be able to use a dedicated kernel just for software lifecycle activities for the system, whereas the system itself is to remain unchanged. During the system copy export, while processing the [Use Dedicated Kernel for System Copy](#) screen, you can specify that you want to use a dedicated kernel. Having chosen this option, on the next screen you are prompted for SAP kernel archives that you want to use for the export itself - SAPEXE.SAR and SAPEXEDB.SAR. The software provisioning manager then uses these archives instead of those installed in the source system for running the export.

### Related Information



[Preparing the Media Required for Performing the Export \[page 53\]](#)

[System Copy Procedure \[page 59\]](#)

## 4.1.3 Preparing the Table Split

The R3ta or - if the SAP kernel version of the source system is 7.40 or higher - SAPuptool processes large tables. Instead of exporting/importing one table with one R3load process, the table is processed in, for example, 10 entities.

### Prerequisites

- For prerequisites, see SAP Note [1783927](#)  (*Prerequisites for Table Splitting with target HANA database*).
- We recommend that you perform a test run to identify the tables with the longest runtime, as not always the largest tables require the longest runtime. To get statistical data about runtimes, use `MIGTIME` during the export and import. For more information, see SAP Note [784118](#) .
- Otherwise, create a list of the largest tables in the database before the export to identify candidates for table splitting (by using transaction `DBACOCKPIT` or `DB02`).

- For using the R3ta or - if the SAP kernel version of the source system is 7.40 or higher - the SAPuptool, consider the following:
  - The software provisioning manager offers a corresponding option in the export dialog – see below for more information.
  - Under certain conditions, we recommend that you create additional temporary indexes on the column used in the `WHERE` condition. Depending on the database, this may not be feasible during productive operation because of time and table locking.
  - In contrast to previous statements, you can also use database-specific splitters, not only the generic R3ta or - if the SAP kernel version of the source system is 7.40 or higher - the generic SAPuptool.
  - As for all R3\* tools, always use the latest version of the R3ta or - if the SAP kernel version of the source system is 7.40 or higher - the SAPuptool. Using an outdated version of the R3ta or the SAPuptool increases your risk of receiving incomplete `WHR` files, which can cause data corruption.
  - If parallel processing is not optimal or if the single packages are serially processed, the complete processing time for one table can increase when using `WHERE` conditions.
  - The export and import must be performed with migration monitor if the table splitting feature is used.
  - For R3ta some platforms allow the creation and usage of an `R3ta_hints.txt` file, with which you can instruct the R3ta to use specific columns of a table to create a `WHERE` condition. For more information, see section *Using Hints*.  
If you plan to use `R3ta_hints.txt`, check whether it contains a valid column for the table that you want to split. You can reduce the runtime of R3ta significantly by choosing a table column with a good selectivity. If no field is provided, a selectivity analysis has to be performed over several columns, which will increase the overall runtime of the splitting.

## Context

Each entity can be processed by different R3load processes. The advantages of splitting the tables are:

- Large tables are processed in smaller packages. If the export or import of a table aborts with an error, only the processing of the package where the error occurred has to be repeated and not for the complete table.
- The export and import of one table can be performed in parallel by starting several R3load processes to work on some packages in parallel.
- The export and import has to be performed with the migration monitor when the table splitting feature is used. For more information about the migration monitor, see [R3load Procedures Using the migration monitor \[page 134\]](#).

## Restrictions

- Only tables that are described in the SAP dictionary can be split.
- The following tables cannot be split:
  - DDNTF
  - DDNTF\_CONV\_UC
  - DDNTT
  - DDNTT\_CONV\_UC
  - DDLOG (is never copied, but created empty in the target system)
  - DDXTT

- DDXTF
- DDXTT\_CONV\_UC
- DDXTF\_CONV\_UC
- Parallel data export of a table is supported by all database platforms but not parallel data import. When the target database platform does not support the parallel data import, the migration monitor has to be configured in the way that the data import processes the packages are sequentially. For more information, see *Processing Split Tables*.

## Procedure

1. Create a file that contains lines of the form `<table>%<nr_of_splits>` for all tables to be split.

**Oracle PL/SQL splitter only:** Use the following form:

`<table>%<nr_of_splits>;<rowid_or_column>`. For more information about the Oracle PL/SQL splitter, see SAP Note [1043380](#).

**SAP HANA only:** You can set additional parameters using the following form:

`<table>%<nr_of_splits>[,<additional SAPuption parameters>]`. To split tables using partition restriction, use the additional parameter `sqloptions=check4tablepartitions`. For more information about partition-based table split, see SAP Note [2784715](#).

2. Start the software provisioning manager as described in [Running Software Provisioning Manager \[page 81\]](#).
3. On the *Welcome* screen, choose **> <Product> > <Database> > System Copy > Source System > Based on <Technical\_Stack> > Table Splitting Preparation**.
4. Follow the instructions on the software provisioning manager screens and enter the requested parameters, including the **<SAPSID>**, the file that contains the split information, the export directory, and the number of parallel `R3ta` or - if the SAP kernel version of the source system is 7.40 or higher - `SAPuption` jobs.

### ⚠ Caution

The specified path to the export directory must not contain blanks!

5. After you have entered all requested input parameters, the software provisioning manager displays the [Parameter Summary](#) screen. This screen shows both the parameters that you entered and those that the software provisioning manager set by default. If required, you can revise the parameters before starting the table split.
6. To start the table split, choose [Start](#).

Now the `*.WHR` files and the `whr.txt` file are created in the `ABAP/DATA` subdirectories of the export directory.

### ⚠ Caution

When doing a code page conversion (non-Unicode → Unicode; 4102 ↔ 4103), make sure not to use a `WHERE` condition with the [PAGENO](#) column included. If the [PAGENO](#) column is included in the `WHERE` condition, repeat the table splitting – either with different splitting parameters or by defining a suitable column for this table using the `R3ta_hints.txt`.

7. Check in the export directory `<Export_Dump_Directory>/ABAP/DATA` if `*.whr` files and a `whr.txt` file have been created for all tables that are to be split.
  - If no `*.whr` files and no `whr.txt` file could be produced for some of these tables, create fewer packages for these tables:
    1. Create a new, empty installation directory.
    2. Define a new, empty export dump directory `<Temporary_Dump_Directory>`.
    3. Run the *Prepare Table Splitting* service again and provide an input file that contains only the missing tables with a lower number of packages for each defined table.
  - If the `*.whr` files and an entry in the `whr.txt` file have been created for the missing tables, merge these results with the results from the first *Prepare Table Splitting* run:
    1. Copy the `*.whr` files from `<Temporary_Dump_Directory>/ABAP/DATA` to `<Export_Dump_Directory>/ABAP/DATA`.
    2. Add the lines from `<Temporary_Dump_Directory>/ABAP/DATA/whr.txt` to `<Export_Dump_Directory>/ABAP/DATA/whr.txt`.
  - When using the `SAPuption1`, you might have a `NUMBER+1` number of split packages in the end. Therefore, pay attention if special options are used in the `orderBy.txt` file for the affected packages. In that case, you have to insert the missing entries in `orderBy.txt`.
8. If required, create the temporary index on the tables of the source system to be split.

**Oracle only:** This is not required if you perform a database export using the Oracle-specific method with the Oracle PL/SQL splitter.

For more information, see paragraph *Creating a Temporary Index*.

## Related Information

[Using Hints \(R3ta Only\) \[page 72\]](#)

[Creating a Temporary Index \(R3ta Only\) \[page 73\]](#)

[Processing Split Tables \[page 153\]](#)

### 4.1.3.1 Using Hints (R3ta Only)

Some platforms allow the creation and usage of an `R3ta_hints.txt` file, with which you can instruct `R3ta` to use specific columns of a table to create a `WHERE` condition.

With the file `R3ta_hints.txt`, you can instruct `R3ta` to use specific columns of a table to create a `WHERE` condition. The file has to be located in the directory in which you start `R3ta`.

With one line in the file `R3ta_hints.txt`, you specify the table name followed by one or more column names, separated by a blank. The columns have to be part of the primary key of the table. These specifications are used by `R3ta` to create the `WHERE` condition.

A file `R3ta_hints.txt` with column hints for several tables is delivered with the installation media (folder `IM_<OS>`). If you want to modify this file, copy it from the directory `IM_<OS>/COMMON/INSTALL` to the installation directory and adapt it according your requirements as soon as the *Parameter Summary* dialog appears and before starting the processing phase.



## 4.1.3.2 Creating a Temporary Index (R3ta Only)

If required, create the temporary index on the tables of the source system to be split.

### Context

**IBM Db2 for z/OS only:** Create the corresponding temporary index on the database with database tools. Only create a temporary index if you want to perform an unsorted unload. This is the case when you use a DDLDB2.TPL file with no ORDER\_BY\_PKEY and the R3load does not overrule this setting. Which tables cannot be unloaded unsorted is described in SAP Note [954268](#).

#### ❖ Example

1. Use the DEFER YES parameter to create the index.
2. Afterwards, use the REBUILD INDEX job to speed up the index creation process.

For each table to be split, R3ta creates the following files to facilitate the creation of the temporary index:

File	Description
<table>_IDX.STR	Contains the description of the temporary index; the default index name is <table>~IMG.
<table>_IDX.TSK	Contains the task to create the temporary index.
<table>_IDX.cmd	R3load command file for creating the temporary index.
DRP_<table>_IDX.TSK	Contains the task to drop the temporary index.
DRP_<table>_IDX.cmd	R3load command file for dropping the temporary index.

You can use the R3load cmd, STR, and TSK files created by the R3ta to create the index.

### Procedure

1. **IBM DB2 for IBM i; IBM Db2 for Linux, UNIX, and Windows; IBM Db2 for z/OS; SAP MaxDB; MS SQL Server, Oracle only:** Make sure that you do not lock the table while creating the temporary index. Depending on your database platform it might be necessary to modify the create index statement in the DDL<DBTYPE>.TPL file.
2. Call R3load as user <sapsid>adm with the following parameters:

```
R3load -dbcodepage <dbcodepage_of_source_system> -i  
<table>_IDX.cmd -l <table>_IDX.log
```

If your source system is a non-Unicode system, the dbcodepage is 1100. If your source system is a Unicode system, the dbcodepage is 4102 (big-endian) or 4103 (little-endian).

## 4.1.4 Preparing the Package Split

You can use the `Package Splitter` for splitting the following:

- `STR` (initially created by `R3Idctl`) and `EXT` files (provide sizes of tables, created by `R3szchk`)
- 6.40: `TSK` files with `WHERE` clauses (including an adaptation of the corresponding `STR` and `EXT` files)
- 7.00: `WHR` files with `WHERE` clauses (including an adaptation of the corresponding `STR` and `EXT` files)

The `Package Splitter` (and `R3ta` or - if the SAP kernel version of the source system is 7.40 or higher - `SAPuption`) offers the following options that you can set in the corresponding export dialog of the software provisioning manager:

**SAP System Split STR Files**

Enter the parameters for the Java splitting tool.

**Splitting Tool Parameters**

- ☒ Largest Tables in Separate Packages
- \*Number of Tables to Be Extracted: 10
- ☒ Split Packages with Size More than Limit
- \*Package Size Limit [MB]: 1000
- ☐ Split Packages by Number of Tables
- \*Number of Tables Limit: 1000
- ☒ Extract Tables with Size More than Limit
- \*Table Size Limit [MB]: 300
- ☒ Split Predefined Tables
- \*Table Input File: /tmp/kliaus\_export/ABAP/DATA/whr.txt

**Additional Information**  
If you want to split by *Number of Largest Tables*, by *Package Size Limit*, or by *Table Size Limit* (first three splitting options), `EXT` files are mandatory and have to be created during the export. If `EXT` files do not exist for your database platform, the first three options are ignored if selected, and you have to specify an input file.

- *Number of tables to be extracted*  
Defines how many of the largest tables of each package will be extracted, default value is 10. As some packages might contain many tables (in the range of about 10.000 tables), you might want to increase this value (see values below).
- *Package Size Limit*  
This parameter defines the maximum size of an `STR` package, comprising all tables. In case the size should be above this limit, the package will be split. Default value is 1000MB.
- *Number of Tables Limit*  
This new split feature (available with the latest tool versions) runs after the other package splitting options finished. It takes care that every `STR` file contains the maximum amount of tables or less. This is helpful in case a package contains a lot of tables with less content (or empty tables – for example, in case of SAP Business Warehouse (SAP BW) migrations, where you might have a lot of empty tables in one `STR` file): while the other split options would not get active due to the small size, this split feature would help to reduce the corresponding runtimes.
- *Table Size Limit*  
This parameter defines the maximum table size – if a table should be larger, it gets extracted from the `STR` file. Default value is 300MB.

- [Split Predefined Tables](#)

Optionally, specify a file containing tables (in most cases: your largest tables) that you want to get split into several pieces. As soon as the export of one split part has finished, the target side can already start processing (instead of having to wait for the export of the whole table).

Table splitting is done by `R3ta` or - if the SAP kernel version of the source system is 7.40 or higher - `SAPupTool` (see above). For the other options, the Package Splitter is used by the software provisioning manager.

The best way to find the optimum of these parameters is to run migration tests and afterwards analyze them using the `Migtime` tool – for more information, see [SAP Note 784118](#). As a starting point, try the following parameters:

- Extract the 150 largest tables
- Extract tables larger as 200MB from the package
- Package size: 1000MB
- Corresponding command line (can also be triggered in corresponding dialog):  

```
./str_splitter.sh -strDirs -top 150 -tableLimit 500 -packageLimit 1000
```

## More Information

For more information, see:

- SAP Note [784118](#) (system copy tools for ABAP systems)
- [Using the Package Splitter Tool \[page 167\]](#)

## 4.1.5 Preparing Parallel Export and Import

If you want to perform export processes in parallel to import processes, you have to prepare the source system for the export.

### Context

The preparation includes creating the export directory structure.

#### ⚠ Caution

Parallel export and import without [Export Preparation](#) is not supported. If you do not prepare the export, you have to wait for the export results before you can start with the target system setup.

## Procedure

1. Run the software provisioning manager to perform the [Export Preparation](#) as described in [Exporting the Source System \[page 77\]](#).

This step creates the export directory structure.

2. Share or transfer the complete export directory with its structure to the target host.

If you transfer the export directory instead of sharing it, make sure that you transfer it while you are processing the [Database Instance Export](#) option, after you have stopped the source system and before you proceed with the export procedure.

For more information, see [Transferring the Export Files to the Target Host \[page 102\]](#).

## Related Information

[About the Migration Monitor \[page 134\]](#)

[Transferring the Export Files to the Target Host \[page 102\]](#)

### 4.1.6 Additional Considerations for the Migration to SAP HANA Database (Export)

- Declustering is performed by default during the export – that is, cluster tables are made transparent. This is also the case if you are using parallel export/import with the Net Exchange or the FTP option. Only if you are using parallel export/import with the Socket Mode option, declustering has to take place during import. Even in this case, no direct action is required from you, as the latest version of software provisioning manager/migration monitor adapts the procedure automatically.
- With parallel export/import, `SAPNTAB` gets imported first (sequentially), before parallel import is started.
- Perform the splitting as prepared above under [Preparing the Migration to SAP HANA Database \[page 49\]](#).
- Sorted versus unsorted export:  
The default setting for the data export is unsorted (the default got changed from sorted to unsorted with only some hard-coded exceptions). It is recommended that you keep the defaults. Only change the default on explicit advice by development support.

#### → Recommendation

It is recommended that you keep the defaults. Only change the default on explicit advice by development support.

- Performance-relevant considerations for the export:
  - Check if [SAP Note 1775293](#) (Migration/system copy to SAP HANA using latest SWPM 1.0) contains any performance-relevant aspects.
  - Optionally, you can use more than one SAP application server to increase the performance of the export:
    - In the software provisioning manager, start also here with the [Database Instance Export](#) option, but select the [Use Additional Export Hosts](#) on the corresponding [SAP System Database Export](#) screen.

### i Note

It is not necessary to combine this feature with the execution of a parallel export and import.

With this, a package filter file is created for each host involved in the export – you can specify details in feature-specific screens that come up in the course of the [Define Parameters](#) phase - such as how many package filter files or hosts you want to involve in the export, the name of the files, and the unload order. By default, the same amount of packages (measured by size or runtime) is assigned to each single package filter file or host.

- For each additional package filter file you have specified before, start the software provisioning manager with option [Database Instance Export on Additional Host](#), which exports the remaining packages, as defined in the package filter file. For this, you can start the software provisioning manager on the same host or any other host on which an SAP instance of this SAP system is running.
- Update database statistics, if the source database requires a manual refresh of the database statistics.

## Troubleshooting

If the output of the ABAP report SMIGR\_CREATE\_DDL is very large, read SAP Note [2022386](#) .

## 4.1.7 Exporting the Source System

Here you can find information about how to run the software provisioning manager to perform the export on the source system.

For more information about the overall sequence of steps required for exporting the source system, see [System Copy Procedure \[page 59\]](#).

## Related Information

[Prerequisites for Running Software Provisioning Manager \[page 78\]](#)

[Running Software Provisioning Manager \[page 81\]](#)

## 4.1.7.1 Prerequisites for Running Software Provisioning Manager

Make sure you fulfil the following prerequisites before running the software provisioning manager.

- For the SL-UI, make sure that the following web browser requirements are met:
  - You have one of the following supported browsers on the device where you want to run the SL-UI:
    - Google Chrome (recommended)
    - Mozilla Firefox
    - Microsoft Edge
    - Microsoft Internet Explorer 11 or higher.

Always use the latest version of these web browsers.

- If you copy the SL-UI URL manually in the browser window, make sure that you open a new Web browser window in private browsing mode (Internet Explorer), incognito mode (Chrome) or private browsing mode (Firefox). This is to prevent Web browser plugins and settings from interfering with the SL-UI.

### ⚠ Caution

The software provisioning manager uses a self-signed certificate, which is used temporarily only while the software provisioning manager is running. This certificate is not trusted by the browser unless it is imported manually by the user running the software provisioning manager. This behavior is intentionally designed in this way because - unlike ordinary public web servers - the software provisioning manager has different usage patterns. You must configure your browser to trust the self-issued certificate of the software provisioning manager after carefully performing the "thumbprint" verification described in [Running Software Provisioning Manager \[page 81\]](#). For more information about adding trusted certificates, see the documentation of your browser.

For more information about the SL-UI, see [Useful Information about Software Provisioning Manager \[page 86\]](#).

- The software provisioning manager uses shell scripts to obtain the environment for user `<sapsid>adm`.
  - If user `<sapsid>adm` does not yet exist, a working `/bin/csh` must be available on the host where you run the software provisioning manager. For more information about recommended login shells, see SAP Note [202227](#).
  - If `<sapsid>` already exists and uses `csh`, before you start the software provisioning manager, execute the following command as user `<sapsid>` to make sure that the `csh` scripts are up-to-date, depending on your UNIX OS platform:  

```
/bin/csh -c "source /home/<sapsid>adm/.cshrc;env" or /bin/csh -c "source /home/<sapsid>adm/.login;env"
```
- Make sure that your operating system does not delete the contents of the temporary directory `/tmp` or the contents of the directories to which the variables `TEMP`, `TMP`, or `TMPDIR` point, for example by using a `crontab` entry.  
Make sure that the temporary directory has the permissions `755`.
- Make sure that you have at least 700 MB of free space in the installation directory for each installation option. In addition, you need 700 MB free space for the software provisioning manager executables. If you cannot provide 700 MB free space in the temporary directory, you can set one of the environment variables `TEMP`, `TMP`, or `TMPDIR` to another directory with 700 MB free space for the software provisioning manager executables.

You can set values for the `TEMP`, `TMP`, or `TMPDIR` environment variable to an alternative installation directory as described in section [Useful Information about Software Provisioning Manager \[page 86\]](#).

### Note

Some tools such as `jspitter` may create files while the software provisioning manager is running. The required free space in the `/tmp` directory depends on the amount of databases which you intend to unload.

- Make sure that `umask` is set to **022** for the user with `root` permissions that you want to use for running the software provisioning manager.

As the user with `root` permissions that you want to use for running the software provisioning manager, enter the following command: **`umask 022`**

- Only valid for 'Platform': AIX  
**AIX:** Make sure that you have set the limits for operating system users as described in SAP Note [323816](#).

End of 'Platform': AIX

- Only valid for 'Platform': HP-UX, Linux, Oracle Solaris  
**Linux:** On Linux, starting with SLES 15, RHEL 8 and Oracle Linux 8, and respective recent SAP kernel patch levels, there is native integration into `systemd`. In this case, limits for operating system users `root`, `<sapsid>adm`, and your database-specific operating system users do not need to be set any longer. Make sure that `polkit` is installed. `systemd` requires `polkit` for authorization checks for the `<sapsid>adm` user. For older Linux versions and SAP kernel patch levels, however, you must still set these limits. For more information about how to proceed for older Linux versions, see the following instructions. For more information about Linux with `systemd` and the relevant SAP kernel patch levels, see SAP Note [3139184](#).  
**HP-UX, Oracle-Solaris, Linux (versions lower than SLES 15, RHEL 8 and Oracle Linux 8 or lower SAP kernel patch levels):** Make sure that you have set the limits for operating system users `root`, `<sapsid>adm`, and your database-specific operating system users (see also sections *Creating Operating System Users and Groups* and *Running the Software Provisioning Manager* in the installation guide).

### Caution

Caution: the `limit` mechanism supports hard- and soft-limits. The soft-limit cannot be bigger than the hard-limit. The hard-limit can be set/increased by the root user like: **`limit -h <limit> <new_value>`**, for example **`limit -h datasize unlimited`**.

- Using `csh` shell, the output of command `limit` needs to be at least as follows:

### Example

The following table lists example output taken from SUSE Linux Enterprise Server 15 (x86\_64).

Output	Properties
<code>cputime</code>	<code>unlimited</code>
<code>filesize</code>	<code>unlimited</code>
<code>datasize</code>	<code>unlimited</code>
<code>stacksize</code>	<code>8192 KB</code>

Output	Properties
coredumpsize	unlimited
descriptors	8192
memoryuse	unlimited

- Using `sh` or `ksh` shell, the output of command `ulimit -a` needs to be at least as follows:

#### ❖ Example

The following table lists example output taken from SUSE Linux Enterprise Server 15 (x86\_64).

Output sh	Output ksh	Properties
cpu time (seconds)	cpu time (seconds)	unlimited
file size (blocks)	file size (blocks)	unlimited
data seg size (kbytes)	data size (Kibytes)	unlimited
stack size (kbytes)	stack size (Kibytes)	8192 KB
core file size (blocks)	core file size (blocks)	unlimited
open files	nofile	8192
max memory size (kbytes)	max memory size (Kibytes)	unlimited

End of 'Platform': HP-UX, Linux, Oracle Solaris

- Make sure that the database is **up and running** before starting the installation.
- Make sure that the following ports are not used by other processes:
  - Port 4237 is used by default as HTTPS port for communication between the software provisioning manager and the SL-UI.  
If this port cannot be used, you can assign a free port number by executing `sapinst` with the following command line parameter:  
**SAPINST\_HTTPS\_PORT=<Free Port Number>**
  - Port 4239 is used by default for displaying the feedback evaluation form at the end of the software provisioning manager processing.  
The filled-out evaluation form is then sent to SAP using HTTPS.  
If this port cannot be used, you can assign a free port number by executing `sapinst` with the following command line parameter:  
**SAPINST\_HTTP\_PORT=<Free Port Number>**
- If you want to perform the export in unattended mode, see [System Provisioning Using an Input Parameter File \[page 88\]](#) which describes an improved procedure using `infile.params`.
- Specify an **empty** directory with sufficient disk space for the export dump on the host where you want to perform the export. Make sure that this directory does not contain any files from any previous system copy



exports. If you cancelled a system copy export and want to perform the export again, make sure that you remove all files from the previously cancelled export before you start the export from scratch.

- **Caution:** Make sure that you shut down all SAP application servers before the export. The database must still be running. Otherwise, the target system might be inconsistent.

## 4.1.7.2 Running Software Provisioning Manager

This section describes how to run the software provisioning manager to perform the export for system copy.

### Prerequisites

For more information, see [Prerequisites for Running Software Provisioning Manager \[page 78\]](#).

### Context

The software provisioning manager has a web browser-based GUI named “SL-UI of the software provisioning manager” - “SL-UI” for short.

This procedure describes an installation where you run the software provisioning manager and use the SL-UI, that is you can control the processing of the software provisioning manager from a browser running on any device.

For more information about the SL-UI, see [Useful Information about Software Provisioning Manager \[page 86\]](#).

### Procedure

1. Log on to the host where you want to run the software provisioning manager.

Make sure that you log on as a user with `root` permissions.

#### Caution

Make sure that this user has not set any environment variables for a different SAP system or database.

#### Caution

Do not use an existing `<sapsid>adm` user or built-in administrator.

If your security policy requires that the person running the software provisioning manager is not allowed to know the credentials of a user with `root` permissions on the host where the software provisioning manager is to perform the export, you can specify another operating system user for authentication purposes.

You do this using the `SAPINST_REMOTE_ACCESS_USER` parameter when starting the `sapinst` executable

from the command line. You must confirm that the user is a trusted one. For more information, see SAP Note [1745524](#).

2. Make the required media available.

For more information, see [Preparing the Media Required for Performing the Export \[page 53\]](#).

#### → Recommendation

Make the installation media available **locally**. For example, if you use Network File System (NFS), reading from media mounted with NFS might fail.

Only valid for 'Platform': Oracle Solaris

#### i Note

If you mount installation media, make sure that you do this with option **nomaplace**.

End of 'Platform': Oracle Solaris

3. Start the software provisioning manager as follows:

Open a command prompt and enter the following command:

```
/<Path_To_Unpack_Directory>/sapinst
```

#### i Note

If you want to run a system copy with parallel export/import using the migration monitor with the R3load socket option, and the target database is declustered, start the software provisioning manager for the database instance export with command line option **SUPPORT\_DECLUSTERING=false**

The software provisioning manager GUI starts automatically by displaying the *Welcome* screen.

#### i Note

If you want to use a virtual host name, start the software provisioning manager with the software provisioning manager property **SAPINST\_USE\_HOSTNAME** as follows:

```
/<Path_To_Unpack_Directory>/sapinst SAPINST_USE_HOSTNAME=<Virtual_Host_Name>'
```

#### ⚠ Caution

Make sure that the installation directory is not mounted with NFS, or there might be problems when starting the Java Virtual Machine.

4. The software provisioning manager now starts and waits for the connection with the SL-UI.

You can find the URL you require to access the SL-UI at the bottom of the shell from which you are running the software provisioning manager.

```
...
*****
Open your browser and paste the following URL address to access the GUI
https://[<hostname>]:4237/sapinst/docs/index.html
Logon users: [<users>]
*****
...
```

## i Note

If the host specified by `<hostname>` cannot be reached due to a special network configuration, proceed as follows:

1. Terminate the software provisioning manager as described in [Useful Information about Software Provisioning Manager \[page 86\]](#).
2. Restart the software provisioning manager from the command line with the `SAPINST_GUI_HOSTNAME=<hostname>` property.  
You can use a fully-qualified host name.

If you have a supported web browser (see [Prerequisites for Running Software Provisioning Manager \[page 78\]](#)) installed on the host where you run the software provisioning manager, you can open this URL directly in the shell. Otherwise, open the URL in a supported web browser that runs on another device.

## ⚠ Caution

After opening the browser URL, make sure that the URL in the browser starts with “https://” to avoid security risks such as SSL stripping .

Before you reach the [Welcome](#) screen, your browser warns you that the certificate of the `sapinst` process on this computer could not be verified.

Proceed as follows to avoid security risks such as a man-in-the-middle attack:

1. Click on the certificate area on the left hand side in the address bar of your browser, and view the certificate.
2. Open the certificate fingerprint or thumbprint, and compare all hexadecimal numbers to the ones displayed in the console output of the software provisioning manager.  
Proceed as follows to get the certificate fingerprint or thumbprint from the server certificate printed in the software provisioning manager console:
  1. Go to the `sapinst_exe.xxxxxx.xxxx` directory in the temporary directory to which the software provisioning manager has extracted itself:  
`<User_Home>/ .sapinst/`
  2. In the `sapinst_exe.xxxxxx.xxxx` directory, execute the `sapgenpse` tool with the command line option `get_my_name -p`.  
As a result, you get the server fingerprint or thumbprint from the server certificate.
3. Accept the warning to inform your browser that it can trust this site, even if the certificate could not be verified.

The SL-UI opens in the browser by displaying the [Welcome](#) screen.

5. On the [Welcome](#) screen, choose **> <Product> > <Database> > System Copy > Source System > Based on AS ABAP >**.

## i Note

Products with the addition “SAP internal only” are only for SAP internal purposes and may not be used outside of this purpose.

### i Note

If you want to copy SAP Business Suite powered by SAP HANA 1.0, on the *Welcome* screen, choose [SAP Business Suite powered by SAP HANA](#) > <Product> > <Database> > [System Copy](#) > [Source System](#) > [Based on AS ABAP](#) .

Select the corresponding system copy option from the tree structure according to the sequence of the process flow for the [database-independent system copy procedure \[page 58\]](#).

### i Note

Do **not** perform these steps if you perform a system copy using a **database-specific** method because then you do not perform an export using Software Provisioning Manager 1.0 (the “software provisioning manager”) but only use Software Provisioning Manager 1.0 for installing the target system. For more information, see [Database-Specific System Copy \[page 111\]](#).

6. Choose [Next](#).

### i Note

If there are errors during the self-extraction process of the software provisioning manager, you can find the log file `dev_selfex.out` in the temporary directory.

7. Follow the instructions in the software provisioning manager input screens and enter the required parameters.

### i Note

To find more information on each parameter during the [Define Parameters](#) phase, position the cursor on the required parameter input field , and choose either `F1` or the [HELP](#) tab. Then the available help text is displayed in the [HELP](#) tab.

### ⚠ Caution

The digital signature of installation media and installation archives is checked **automatically** during the [Define Parameters](#) phase while processing the [Media Browser](#) and - if you perform an archive-based installation - the [Software Package Browser](#) screens.

Note that this automatic check is only committed once and **not** repeated if you modify artifacts such as SAR archives or files on the media **after** the initial check has been done. This means that - if you modify artefacts later on either during the remaining [Define Parameters](#) phase or later on during the [Execute Service](#) phase - the digital signature is not checked again.

For more information, see SAP Note [2393060](#) .

8. After you have entered all requested input parameters, the software provisioning manager displays the [Parameter Summary](#) screen. This screen shows both the parameters that you entered and those that the software provisioning manager set by default.

If required, you can revise the parameters before starting the export procedure.

9. To start the execution, choose [Next](#).

The software provisioning manager starts the export and displays its progress of the system copy export during the processing phase.

10. If required, delete directories with the name `sapinst_exe.xxxxxx.xxxx` after the software provisioning manager has finished. Sometimes these remain in the temporary directory.

#### → Recommendation

Keep all software provisioning manager directories until you are sure that the system, including all instances, is completely and correctly installed. Once the system is completely and correctly installed, make a copy of the software provisioning manager directories with all their contents. Save the copy to a physically separate medium, such as a medium or a USB drive that is separate from your installation hosts.

This might be useful for analyzing any issues that might occur later when using the system. For security reasons, do **not** keep the software provisioning manager directories on hosts where you processed it, but make sure that you delete them after saving them separately.

11. If you copied installation media to your hard disk, you can delete these files when the software provisioning manager has successfully completed.
12. For security reasons, we recommend that you delete the `.sapinst` directory within the home directory of the user with which you ran the software provisioning manager:

```
<User_Home>/ .sapinst/
```

13. For security reasons, we recommend that you remove the operating system users from the group `sapinst` **after** you have completed the installation.

#### i Note

This step is only required, if you did **not** specify during the [Define Parameters](#) phase that the operating system users are to be removed from the group `sapinst` **after** the execution of the software provisioning manager has completed.

14. The software provisioning manager log files contain IP addresses and User IDs such as the ID of your S-User. For security, data protection, and privacy-related reasons we strongly recommend that you delete these log files once you do not need them any longer.

You find the software provisioning manager log files in the `sapinst_instdir` directory. For more information, see [Useful Information about Software Provisioning Manager \[page 86\]](#).

## Related Information

[Useful Information about Software Provisioning Manager \[page 86\]](#)

[Restarting Interrupted Processing of Software Provisioning Manager \[page 93\]](#)

[Troubleshooting with Software Provisioning Manager \[page 97\]](#)

### 4.1.7.2.1 Additional Information about Software Provisioning Manager

The following sections provide additional information about the software provisioning manager.

#### [Useful Information about Software Provisioning Manager \[page 86\]](#)

This section contains some useful technical background information about the software provisioning manager and the software provisioning manager's SL-UI.

#### [System Provisioning Using an Input Parameter File \[page 88\]](#)

Provisioning with software provisioning manager, for example installation, of SAP systems in unattended mode with an input parameter file.

#### [Restarting Interrupted Processing of Software Provisioning Manager \[page 93\]](#)

Here you find information about how to restart the software provisioning manager if its processing has been interrupted.

#### [Troubleshooting with Software Provisioning Manager \[page 97\]](#)

This section tells you how to proceed when errors occur while the software provisioning manager is running.

#### [Troubleshooting during the Export Process \[page 98\]](#)

If the export process aborts during the *Execute Service* phase (for example, due to a hardware failure, such as power outage, operating system crash, file system full), you have to repeat the export of the complete package.

#### [Using the Step State Editor \(SAP Support Experts Only\) \[page 98\]](#)

This section describes how to use the `Step State Editor` available in the software provisioning manager.

### 4.1.7.2.1.1 Useful Information about Software Provisioning Manager

This section contains some useful technical background information about the software provisioning manager and the software provisioning manager's SL-UI.

- The software provisioning manager has a framework named “SAPinst”. For more information about the current SAPinst Framework version and its features, see SAP Note [3207613](#) (SAPinst Framework 753 Central Note).
- The software provisioning manager has the web browser-based “SL-UI of the software provisioning manager” - “SL-UI” for short.

The SL-UI uses the SAP UI Development Toolkit for HTML5 - also known as SAPUI5 - a client-side HTML5 rendering library based on JavaScript. The benefits of this new user interface technology for the user are:

- Zero foot print, since only a web browser is required on the client
- New controls and functionality, for example, view logs in web browser.

As of version 1.0 SP24 Patch Level (PL) 5, the software provisioning manager comes with a new look and feel of the SL-UI. For more information, see <https://blogs.sap.com/2018/11/10/new-look-for-software-provisioning-manager/>.

The SL-UI connects the web browser on a client with the `sapinst` executable - which is part of software provisioning manager - running on the installation host using the standard protocol HTTPS. For the SL-UI the software provisioning manager provides a pre-generated URL at the bottom of the shell from which you are running the software provisioning manager. If you have a supported web browser installed on the host where you run the software provisioning manager, you can start the SL-UI directly from this URL. Otherwise, open a web browser supported by the SL-UI on any device and run the URL from there.

For more information about supported web browsers see [Prerequisites for Running Software Provisioning Manager \[page 78\]](#).

If you need to run the **SL-UI in accessibility mode**, apply the standard accessibility functions of your web browser.

- As soon as you have started the `sapinst` executable, the software provisioning manager creates a `.sapinst` directory underneath the `/home/<User>` directory where it keeps its log files. `<User>` is the user with which you have started the software provisioning manager.  
After you have reached the [Welcome](#) screen and selected the relevant software provisioning manager option for the SAP system to be exported, the software provisioning manager creates a directory `sapinst_inst_dir` where it keeps its log files, and which is located directly below the temporary directory. The software provisioning manager finds the temporary directory by checking the value of the `TEMP`, `TMP`, or `TMPDIR` environment variable. If no value is set for these variables, the software provisioning manager uses `/tmp` by **default**.  
All log files which have been stored so far in the `.sapinst` folder are moved to the `sapinst_inst_dir` directory as soon as the latter has been created.  
If you want the `sapinst_inst_dir` directory to be created in another directory than `/tmp`, set the environment variable `TEMP`, `TMP`, or `TMPDIR` to this directory before you start the software provisioning manager.

Shell Used	Command
Bourne shell (sh)	<code>TEMP=&lt;Directory&gt;</code> <code>export TEMP</code>
C shell (csh)	<code>setenv TEMP &lt;Directory&gt;</code>
Korn shell (ksh)	<code>export TEMP=&lt;Directory&gt;</code>

### ⚠ Caution

Make sure that the installation directory is not mounted with NFS, or there might be problems when the Java Virtual Machine is started.

The software provisioning manager records its progress in the `keydb.xml` file located in the `sapinst_inst_dir` directory. Therefore, if required, you can continue with the software provisioning manager from any point of failure, without having to repeat the already completed steps and without having to reenter the already processed input parameters. For security reasons, a variable encryption key is generated as soon as the `sapinst_inst_dir` directory is created by the software provisioning manager. This key is used to encrypt the values written to the `keydb.xml` file.

### → Recommendation

We recommend that you keep all installation directories until the system is completely and correctly installed.

- The software provisioning manager extracts itself to the temporary directory. These executables are deleted again after the software provisioning manager has stopped running. Directories called `sapinst_exe.xxxxxx.xxxx` sometimes remain in the temporary directory after the software provisioning manager has finished. You can safely delete them.

The temporary directory also contains the log file `dev_selfex.out` from the self-extraction process of the software provisioning manager, which might be useful if an error occurs.

#### ⚠ Caution

If the software provisioning manager cannot find a temporary directory, the installation terminates with the error FCO-00058.

- To see a list of all available software provisioning manager properties (command line options) and related documentation, start the software provisioning manager as described above with command line parameter `-p`:  
`./sapinst -p`
- If you want to perform the export in unattended mode, see [System Provisioning Using an Input Parameter File \[page 88\]](#) which describes an improved procedure using `infile.params`.
- Before starting the export, make sure that you have at least the same amount of disk space available in `/sapmnt/<SAPSID>/<Instance_Name>/<SAPSID>/program` as is used in `/sapmnt/<SAPSID>/<Instance_Name>/<SAPSID>/root/origin`.  
During the export, some archives are written to the program subdirectories and the tool aborts if there is not enough space.
- If required, stop the software provisioning manager by choosing the [Cancel](#) button.

#### i Note

If you need to terminate the software provisioning manager, press `Ctrl` + `C`.

## 4.1.7.2.1.2 System Provisioning Using an Input Parameter File

Provisioning with software provisioning manager, for example installation, of SAP systems in unattended mode with an input parameter file.

### Prerequisites

Provisioning of SAP systems can also be done in unattended mode without the user interface of software provisioning manager. This means that, after inserting the required parameters into a parameter-file and running the `sapinst` executable by providing the path to this parameter-file, the installation will run in the background and no further user interaction is required.

### Context

This section describes the steps that you need to execute in addition to the procedure described in this guide, when running software provisioning manager in unattended mode using an input parameter file.



Since the new Web-based SL-UI (see [Useful Information about Software Provisioning Manager \[page 86\]](#)) was introduced in 2017 there are two ways to run the unattended mode: “observer mode” and “non-observer mode”.

## Observer Mode

If you are running an installation in unattended mode but you are sitting in front of the screen, you might want to check the progress from time to time. In this case the “observer mode” makes sense.

Start the installation as described below in the Solution section, using the following parameters:

```
SAPINST_INPUT_PARAMETERS_URL=<path_to_your_parameterfile>
SAPINST_EXECUTE_PRODUCT_ID=<product-id for the installation>
SAPINST_SKIP_DIALOGS=true
```

The software provisioning manager will start the installation in the background AND start a Web Dispatcher and provide an URL to access the SL-UI. The user who has started the installation can now connect to the URL and observe the progress of the installation, for example to look at the logfiles in the Web browser. However, all parameters will be taken from the input parameter file and can not be changed in the Web browser.

## Non-Observer Mode

Choose that mode if you want to run a “scripted” or by other means automated scenario, for example overnight. In that case it is crucial that the process is started without a Web Dispatcher and therefore without the software provisioning manager's SL-UI. Otherwise, the automation could be stuck if software provisioning manager encounters a situation that requires user interaction.

Start the installation as described below in the Solution section, using the following parameters (use the same parameters like for Observer Mode, but provide **SAPINST\_START\_GUISEVER=false** in addition):

```
SAPINST_INPUT_PARAMETERS_URL=<path_to_your_parameterfile>
SAPINST_EXECUTE_PRODUCT_ID=<product-id for the installation>
SAPINST_SKIP_DIALOGS=true
SAPINST_START_GUISEVER=false
```

This will start the installation but this time **NO** Web Dispatcher will be started and no URL to access the SL-UI will be provided either. So the user can not follow the processing of the installation in a Web browser and the installation will run completely in the background.

If the process runs into an error, the software provisioning manager will abort and you have to check for the reason in the log files.

## Restrictions

In exceptional cases, parameters prompted or displayed in the Software Provisioning Manager UI are not maintainable in the input parameter file. If one of those parameters, that are only available in the UI mode of the Software Provisioning Manager, is needed for your unattended installations, you should create a ticket in the best fitting component below BC-INS to get the issue analyzed.

## Must Know about the Input Parameter File

- The input parameter file only contains values that you entered in the software provisioning manager's SL-UI.
- With the SAPinst 749.0.69 or by other means patch we provide a better encryption of passwords in software provisioning manager files:  
If the input parameter file has parameters which are encrypted with Des25 encryption, the instkey.pkey file available in the installation directory contains the key for the encryption. The instkey.pkey file must

be always located in the same directory as the input parameter file and is used to decrypt the values of the encrypted parameters. If you need to copy an input parameter file to another directory, you must also copy the `instkey.pkey` file to this directory.

- Not explicitly set parameters are documented as comments in the generated input parameter file.
- Each parameter has got a documentation assigned as a comment on top.

#### ❖ Example

Example for a parameter that is not used and therefore commented out:

```
# Specify whether software provisioning manager is to drop the schema if
it exists. <= Documentation
# HDB_Schema_Check_Dialogs.dropSchema = false
```

#### ❖ Example

Example for a parameter that is used:

```
# The name of the database schema. <= Documentation
HDB_Schema_Check_Dialogs.schemaName = SAPABAP2
```

- You have to manually provide the media information, using the following convention:

```
SAPINST.CD.PACKAGE.<unique_media_name>=<location>
```

- For each media location you must **manually** insert a dedicated line in your input parameter file. The software provisioning manager does not automatically take over the media locations you entered while processing the *Media Browser* dialog.
- For `<media_name>` you can choose any value, but the `<location>` must be unique.
- To find out the required media entries, open the `summary.html` file which you can find in the installation directory and go to the *Dialog "Media"* section.
- Make sure that you enter the full paths to all required media, relative paths are not sufficient.

#### ❖ Example

Example on UNIX:

```
SAPINST.CD.PACKAGE.KERNEL = /mnt/KERNEL
SAPINST.CD.PACKAGE.LOAD = /mnt/LOAD
SAPINST.CD.PACKAGE.RDBMS = /mnt/RDBMS
```

#### ❖ Example

Example on Windows:

```
SAPINST.CD.PACKAGE.KERNEL = C:\sapdvds\KERNEL
SAPINST.CD.PACKAGE.LOAD = C:\sapdvds\LOAD
SAPINST.CD.PACKAGE.RDBMS = C:\sapdvds\RDBMS
```

- If one media contains several subfolders, you can specify it in one of the following ways:

### ❖ Example

The SAP Export DVDs/media:

```
Installation Master      /usr/local/TESE/SWPM/slinst_d_stream/
IM_OS400_PPC64
Installation Export NW73 (folder EXP1)      /sapmnt/mediaserver2/
arch04_6/51042309/DATA_UNITS/EXP1
Installation Export NW73 (folder EXP3)      /sapmnt/mediaserver2/
arch04_6/51042309/DATA_UNITS/EXP3
Installation Export NW73 (folder EXP2)      /sapmnt/mediaserver2/
arch04_6/51042309/DATA_UNITS/EXP2
```

- By specifying each subfolder:

```
SAPINST.CD.PACKAGE.ExportNW73EXP1=/sapmnt/mediaserver2/
arch04_6/51042309/DATA_UNITS/EXP1

SAPINST.CD.PACKAGE.ExportNW73EXP2=/sapmnt/mediaserver2/
arch04_6/51042309/DATA_UNITS/EXP3

SAPINST.CD.PACKAGE.ExportNW73EXP3=/sapmnt/mediaserver2/
arch04_6/51042309/DATA_UNITS/EXP3
```

- By specifying only the root-folder:

```
SAPINST.CD.PACKAGE.ExportNW73=/sapmnt/mediaserver2/arch04_6/51042309
```

- **Restriction:** Currently you can only specify complete media, not paths to single files like \*.SAR archives.
- When performing a system copy, you need to add one additional media path:

```
SAPINST.CD.PACKAGE.MIGRATION1 = <full path to ABAP Export media>
```

- **Caution:**

If you want to use archives for your installation, you must copy all files that are to be used to a single directory. In the input parameter file you must specify this directory as a download basket, using the `archives.downloadBasket` parameter.

Make sure that there is only one version of the same archive in the directory, for example

`SAPPEXE_<Version>.SAR`

## Procedure

1. You plan and prepare the run as described in [Planning \[page 24\]](#) and [Preparation \[page 45\]](#).
2. Create your input parameter file as follows:
  1. Start software provisioning manager as described in [Running Software Provisioning Manager \[page 81\]](#).
  2. Choose the option you want to run, and follow the instructions on the screens by entering all parameter values.
  3. Stop after the *Parameter Summary* screen has been displayed.
  4. Find the input parameter file named "infile.params" in the installation directory.

- In the same directory, you will also find the `instkey.pkey` file with the keys for the encrypted parameters. For more information, see *Must Know about the Input Parameter File* above.
  - In the same directory, you will also find the `summary.html` file with the required media locations. For more information, see *Must Know about the Input Parameter File* above.
5. If required, you can rename the “`infile.params`” file as you wish.
  3. Adjust the values of the input parameter file as follows:
    1. Edit your input parameter file and modify the parameters according to your needs.
    2. Add required media or archives information line by line.
  4. Identify the Product-ID:
    - To start in unattended mode, you need to know the component ID for the option that are required for your provisioning scenario.  
Proceed as follows:
      1. Open the `sapinst_dev.log` in the installation directory.
      2. Check for the “product-id”

#### ❖ Example

```
product-id=NW_ABAP_ASCS:NW750.ADA.ABAP
```

- Alternatively, you can check the header of the generated input parameter file.

#### ❖ Example

```
product id 'NW_ABAP_ASCS:NW750.ADA.ABAP'
```

5. [Run the software provisioning manager \[page 81\]](#) with the parameters required for unattended mode:
  - Make sure that the `instkey.pkey` file with the keys for the encrypted parameters is available in the same directory as the input parameter file. Otherwise the encrypted parameters cannot be decrypted. For more information, see *Must Know about the Input Parameter File* above.
  - **In observer mode:** Start the `sapinst` executable from an empty directory with the following parameters:
 

```
SAPINST_INPUT_PARAMETERS_URL=<path_to_your_parameterfile>
SAPINST_EXECUTE_PRODUCT_ID=<product-id for the installation>
SAPINST_SKIP_DIALOGS=true
```
  - **In non-observer mode:** Start the `sapinst` executable from an empty directory with the following parameters:
 

```
SAPINST_INPUT_PARAMETERS_URL=<path_to_your_parameterfile>
SAPINST_EXECUTE_PRODUCT_ID=<product-id for the installation>
SAPINST_SKIP_DIALOGS=true
SAPINST_START_GUI_SERVER=false
```
6. After software provisioning manager has completed, perform follow-up activities as described in [Follow-Up Activities \[page 119\]](#).

## Related Information

[SAP Note 2230669 Provisioning with software provisioning manager - for example installation - of SAP systems in unattended mode with an input parameter file.](#)

[SAP Note 2849054 Software Update Manager Automation with software provisioning manager](#)

[SAP Note 2742212 Unattended installation fails with "Empty directory name is not allowed." message](#)

[SAP Note 2626837 'isUnicode': Radio group contains an invalid value ". Valid values are: false|true|](#)

[SAP Note 2669183 ASCS installation failure with Software Provisioning Manager unattended mode \(Non-Observer mode\)](#)

### 4.1.7.2.1.3 Restarting Interrupted Processing of Software Provisioning Manager

Here you find information about how to restart the software provisioning manager if its processing has been interrupted.

## Context

The processing of the software provisioning manager might be interrupted for one of the following reasons:

- An error occurred during the [Define Parameters](#) or [Execute](#) phase:  
The software provisioning manager does not abort the installation in error situations. If an error occurs, the installation pauses and a dialog box appears. The dialog box contains a short description of the choices listed in the table below as well as a path to a log file that contains detailed information about the error.
- You interrupted the processing of the software provisioning manager by choosing [Cancel](#) in the SL-UI.

#### ⚠ Caution

If you stop an option in the [Execute](#) phase, any system or component **installed** by this option is incomplete and not ready to be used. Any system or component **uninstalled** by this option is not completely uninstalled.

The following table describes the options in the dialog box:

Option	Definition
<a href="#">Retry</a>	<p>The software provisioning manager retries the installation from the point of failure without repeating any of the previous steps.</p> <p>This is possible because the software provisioning manager records its progress in the <code>keydb.xml</code> file.</p> <p>We recommend that you view the entries in the log files, try to solve the problem, and then choose <a href="#">Retry</a>.</p> <p>If the same or a different error occurs, the software provisioning manager displays the same dialog box again.</p>
<a href="#">Stop</a>	<p>The software provisioning manager stops the installation, closing the dialog box and the software provisioning manager's SL-UI.</p> <p>The software provisioning manager records its progress in the <code>keydb.xml</code> file. Therefore, you can continue with the software provisioning manager from the point of failure without repeating any of the previous steps. See the procedure below.</p>
<a href="#">Continue</a>	The software provisioning manager continues the installation from the current point.
<a href="#">View Log</a>	Access installation log files.

The following procedure describes the steps to restart an installation, which you stopped by choosing [Stop](#), or to continue an interrupted installation after an error situation.

## Procedure

1. Log on to the installation host as a user with the required permissions as described in [Running Software Provisioning Manager \[page 81\]](#).
2. Make sure that the media media required for the export are still available.

For more information, see [Preparing the Media Required for Performing the Export \[page 53\]](#).

### → Recommendation

Make the installation media available **locally**. For example, if you use remote file shares on other Windows hosts, CIFS shares on third-party SMB-servers, or Network File System (NFS), reading from media mounted with NFS might fail.

Only valid for 'Platform': Oracle Solaris

### i Note

**Oracle Solaris:** If you mount installation media, make sure that you do this with option `nomap1case`.

End of 'Platform': Oracle Solaris

3. Restart the software provisioning manager from the directory to which you unpacked the Software Provisioning Manager archive by executing the following command:

**<Path\_To\_Unpack\_Directory>/sapinst**

4. The software provisioning manager is restarting.

You can find the URL you require to access the SL-UI at the bottom of the shell from which you are running the software provisioning manager.

```
...
*****
Open your browser and paste the following URL address to access the GUI
https://[<hostname>]:4237/sapinst/docs/index.html
Logon users: [<users>]
*****
...
```

### Note

If the host specified by **<hostname>** cannot be reached due to a special network configuration, proceed as follows:

1. Terminate the software provisioning manager as described in [Useful Information about Software Provisioning Manager \[page 86\]](#).
2. Restart the software provisioning manager from the command line with the **SAPINST\_GUI\_HOSTNAME=<hostname>** property.  
You can use a fully-qualified host name.

If you have a supported web browser (see [Prerequisites for Running Software Provisioning Manager \[page 78\]](#)) installed on the host where you run the software provisioning manager, you can open this URL directly in the shell. Otherwise, open the URL in a supported web browser that runs on another device.

### Caution

After opening the browser URL, make sure that the URL in the browser starts with “https://” to avoid security risks such as SSL stripping.

Before you reach the [Welcome](#) screen, your browser warns you that the certificate of the `sapinst` process on this computer could not be verified.

Proceed as follows to avoid security risks such as a man-in-the-middle attack:

1. Click on the certificate area on the left hand side in the address bar of your browser, and view the certificate.
2. Open the certificate fingerprint or thumbprint, and compare all hexadecimal numbers to the ones displayed in the console output of the software provisioning manager.

Proceed as follows to get the certificate fingerprint or thumbprint from the server certificate printed in the software provisioning manager console:

1. Go to the `sapinst_exe.xxxxxx.xxxx` directory in the temporary directory to which the software provisioning manager has extracted itself:  
**<User\_Home>/sapinst/**
2. In the `sapinst_exe.xxxxxx.xxxx` directory, execute the `sapgenpse` tool with the command line option **get\_my\_name -p**.

As a result, you get the server fingerprint or thumbprint from the server certificate.

3. Accept the warning to inform your browser that it can trust this site, even if the certificate could not be verified.

The SL-UI opens in the browser by displaying the [Welcome](#) screen.

5. From the tree structure on the [Welcome](#) screen, select the installation option that you want to continue and choose [Next](#).

The [What do you want to do?](#) screen appears.

6. On the [What do you want to do?](#) screen, decide between the following alternatives and continue with [Next](#):

Alternative	Behavior
<a href="#">Perform a new run</a>	<p>The software provisioning manager does not continue the interrupted export for system copy option. Instead, it moves the content of the old software provisioning manager directory and all software provisioning manager-specific files to a backup directory. Afterwards, you can no longer continue the old option.</p> <p>The following naming convention is used for the backup directory:</p> <pre>log_&lt;Day&gt;_&lt;Month&gt;_&lt;Year&gt;_&lt;Hours&gt;_&lt;Minutes&gt;_&lt;Seconds&gt;</pre> <div><p>❖ Example</p><pre>log_01_Oct_2016_13_47_56</pre></div> <div><p>i Note</p><p>All actions taken by the export for system copy before you stopped it (such as creating directories or users) are not revoked.</p></div> <div><p>⚠ Caution</p><p>The software provisioning manager moves all the files and folders to a new log directory, even if these files and folders are owned by other users. If there are any processes currently running on these files and folders, they might no longer function properly.</p></div>
<a href="#">Continue with the existing one</a>	<p>The software provisioning manager continues the interrupted export for system copy from the point of failure.</p>



## 4.1.7.2.1.4 Troubleshooting with Software Provisioning Manager

This section tells you how to proceed when errors occur while the software provisioning manager is running.

### Context

If an error occurs, the software provisioning manager:

- Stops processing
- Displays a dialog informing you about the error

### Procedure

1. Check SAP Note [SAP Note 3207613](#) (SAPinst Framework 753 Central Note) for known software provisioning manager issues.
2. If an error occurs during the *Define Parameters* or the *Execute Service* phase, do one of the following:
  - Try to solve the problem:
    - To check the software provisioning manager log files (`sapinst.log` and `sapinst_dev.log`) for errors, choose the *LOG FILES* tab.

#### i Note

The *LOG FILES* tab is only available if you have selected on the *Welcome* screen the relevant software provisioning manager option for the SAP system to be exported .

If you need to access the log files before you have done this selection, you can find them in the `.sapinst` directory underneath the `/home/<User>` directory, where `<User>` is the user that you used to start the software provisioning manager.

For more information, see [Useful Information about Software Provisioning Manager \[page 86\]](#).

- To check the log and trace files of the software provisioning manager's SL-UI for errors, go to the directory `<User_Home>/ .sapinst/`
  - Then continue by choosing *Retry*.
  - If required, abort the software provisioning manager by choosing *Cancel* in the tool menu and restart the software provisioning manager. For more information, see [Restarting Interrupted Processing of Software Provisioning Manager \[page 93\]](#).
3. If you cannot resolve the problem, report an incident using the appropriate subcomponent of BC-INS\*.

For more information about using subcomponents of BC-INS\*, see SAP Note [1669327](#).

## 4.1.7.2.15 Troubleshooting during the Export Process

If the export process aborts during the *Execute Service* phase (for example, due to a hardware failure, such as power outage, operating system crash, file system full), you have to repeat the export of the complete package.

### Procedure

- **System Copy – export (common issues)**
  - a. Remove the `<Package> . <nnn>` dump files, the `<Package> . TOC` file, and the `<Package> . log` file.
  - b. Make sure that all tables in the `<Package> . *TSK*` file have the status flag `xeq` or `err` set.
  - c. Repeat the export of the complete package.

- **System Copy – export on UNIX (especially for upgraded systems)**

#### Symptom:

Processes started under the OS users `<sapsid>adm` or `ora<dbsid>` cannot create or open files in the software provisioning manager directory.

#### Reason:

Only members of the `sapinst` UNIX group can access the software provisioning manager directory.

#### Solution:

- a. Manually associate `<sapsid>adm` and `ora<dbsid>` OS users with `sapinst` group if this association is missing.
- b. Verify the `/etc/group` file and check if the `sapinst` group exists and OS users are members of this group.
- c. If the `sapinst` group does not exist yet, start the software provisioning manager. The software provisioning manager creates this group during startup before the product catalog list is displayed.
- d. Edit `/etc/group` file and associate OS users with `sapinst` group.
- e. Continue with the export.

## 4.1.7.2.16 Using the Step State Editor (SAP Support Experts Only)

This section describes how to use the `Step State Editor` available in the software provisioning manager.

### i Note

Only use the `Step State Editor` if the SAP Support requests you to do so, for example to resolve a customer incident.

## Prerequisites

- SAP Support requests you to use the `Step State Editor`.
- Make sure that the host where you run the software provisioning manager meets the requirements listed in [Prerequisites for Running Software Provisioning Manager \[page 78\]](#).

## Procedure

1. Start the software provisioning manager from the command line as described in [Running Software Provisioning Manager \[page 81\]](#) with the additional command line parameter `SAPINST_SET_STEPSTATE=true`
2. Follow the instructions on the software provisioning manager screens and fill in the parameters prompted during the [Define Parameters](#) phase until you reach the [Parameter Summary](#) screen.
3. Choose [Next](#).

The `Step State Editor` opens as an additional dialog. Within this dialog you see a list of all steps to be executed by the software provisioning manager during the [Execute Service](#) phase. By default all steps are in an initial state. Underneath each step, you see the assigned software provisioning manager component. For each step you have a [Skip](#) and a [Break](#) option.

- Mark the checkbox in front of the [Break](#) option of the steps where you want the software provisioning manager to pause.
  - Mark the checkbox in front of the [Skip](#) option of the steps which you want the software provisioning manager to skip.
4. After you have marked all required steps with either the [Break](#) or the [Skip](#) option, choose [OK](#) on the [Step State Editor](#) dialog.

The software provisioning manager starts processing the [Execute Service](#) phase and pauses one after another when reaching each step whose [Break](#) option you have marked. You can now choose one of the following:

- Choose [OK](#) to continue with this step.
  - Choose [Step State Editor](#) to return to the `Step State Editor` and make changes, for example you can repeat the step by marking the checkbox in front of the [Repeat](#) option.
  - Choose [Cancel](#) to abort the software provisioning manager.
5. Continue until you have run through all the steps of the [Execute Service](#) phase of the software provisioning manager.

## 4.1.7.3 Restarting R3load Processes

You can restart failed or canceled R3load processes while the migration monitor is still running.

### Context

The state files `export_state.properties` and `import_state.properties` (see [Output Files \[page 162\]](#)) allow package states to be manually updated to restart failed R3load processes.

#### ❖ Example

If package processing failed and the package state has the value “-”, the state can be set to “0” and processing of the package is restarted.

If you want to restart failed or canceled R3load processes that are using the socket option, R3load processes that process the same package must not be running.

### Procedure

- **Restarting R3load Processes Without Using the Socket Option**
  - a. To restart package processing, set the package state from “-” to “0”.
  - b. To skip package processing, set the package state from “0” or “-” to “+”. (This is not recommended, because it can cause inconsistent data files or database content.)
  - c. If the package is currently being processed (the package state is “?”), then any manual modifications to the package state are ignored.
- **Restarting R3load Processes Using the Socket Option**
  - a. Make sure that no related R3load processes (export or import) are running. For example, if you want to restart an R3load export process and the corresponding import process that processes the same package is still running, cancel it or wait until it has finished.
  - b. There are four possible situations where an R3load restart may be required. Proceed as required:
    - If both the **import and the export** are **completed successfully**, there is nothing to do.
    - If the **export was completed successfully**, but the **import is canceled** with errors, proceed as follows:
      - If the export was successful but the import was canceled when creating the index or the primary key, set the status for `export_state.properties` from “+” to “0”.
      - If the export was completed successfully but the import was canceled when loading the table content, set the status for `export_state.properties` from “+” to “0” and for the export TSK file from “ok” to “err”.
    - If both the **export and the import are canceled** with errors, proceed as follows:
      - If the errors in export and import relate to the same table, there is nothing to do.

- If the errors relate to different tables, set the status of the first object with errors in both the export and the import TSK file to “err” and in the `export_state.properties` and `import_state.properties` files to “-”.

#### ❖ Example

Export TSK File		Import TSK File	
Table Name	Status	Table Name	Status
TAB_1	ok	TAB_1	ok
TAB_2	err	TAB_2	ok
TAB_3	xeq	TAB_3	err
TAB_4	xeq	TAB_4	xeq

The first object with errors here is TAB\_2 (export). This means that in the import TSK file the status for TAB\_2 must be set from “ok” to “err”. The entry in the `export_state.properties` and `import_state.properties` files also must be set from “+” to “0”.

- If the **import is completed successfully** but the **export was canceled** with errors, you can set the status in the `export_state.properties` from “-” to “+”.
- c. Restart the software provisioning manager or the migration monitor to proceed with the system copy.

## 4.1.8 Setting Up the Target System

### Related Information

[Transferring the Export Files to the Target Host \[page 102\]](#)

[Installing the Target System \[page 103\]](#)

## 4.1.8.1 Transferring the Export Files to the Target Host

This section describes how to transfer the complete export directory with its structure to the target host.

### Context

As an alternative, you can also share the complete export directory so that it can be accessed from the target host.

### Procedure

1. On the target host, create a directory `<EXPDIR>` with sufficient space for the database export files available.

#### ⚠ Caution

Do **not** create this directory under the installation directory or another directory that contains installation information (such as the installation media or export files).

Otherwise, the software provisioning manager does not ask you to specify the export directory and automatically chooses one that you may not want to use. In this case, the software provisioning manager does not display the export directory and you cannot change it.

2. Transfer all files and directories (recursively) that are located on the source host in the migration export directory `<EXPDIR>` from the source host to the target host.

You can choose one of the following methods:

- Use the migration monitor with the file transfer protocol (FTP) copy option.

#### i Note

Make sure that you use binary mode for transferring the files.

- Copy the export dump directory manually to the target host.
  - The export dump directory can be shared and thus made accessible on the target host (network share).
3. Check the permissions of the transferred files on the target host.

#### i Note

All files have to be accessible for user `<sapsid>adm` of the target system which is created during the target system installation.

## Related Information

[Additional Considerations for the Migration to SAP HANA Database \(Transfer of the Export File\) \[page 103\]](#)

### 4.1.8.1.1 Additional Considerations for the Migration to SAP HANA Database (Transfer of the Export File)

You can transfer files from the source host to the SAP HANA host using different protocols, for example `NFS` or `FTP`. In advance, consider the following aspects:

- Performance of the file transfer types
- Availability on different platforms (`NFS`, for example, is not available on Microsoft Windows hosts)
- Security requirements (for example, migration monitor currently only supports `FTP`, but not `SFTP`)
- Availability in a customer system landscape (`FTP`, for example, can be forbidden in customer landscapes)
- Which transfer mode and protocol is supported by the software provisioning manager and the `migration monitor` for the parallel export and import?
- Which tool and process is in control of the overall export, transfer, and import process?

### 4.1.8.2 Installing the Target System

This section describes how to set up the target system using the software provisioning manager.

#### Prerequisites

- There is enough free space on the target system for the database load.
- The software provisioning manager automatically performs a reload. If the database software has already been unpacked or installed, or if the database already exists, the software provisioning manager recognizes this automatically and skips the related steps.
- As a post-step during the refresh database instance scenario ([Copying the Database Only – Refresh Database Instance \[page 115\]](#)) and the refresh database content scenario (see [Copying the Database Only – Refresh Database Content \[page 117\]](#)), the software provisioning manager connects to the target SAP system via remote function call (RFC). Since the certificates are from the source system, make sure that secure network communications (SNC) is turned off for the RFC, or at least that the insecure RFC connection is allowed. This is only necessary during the short time of the post-processing steps, and after they are completed, you can turn SNC back on.

#### Context

This system copy guide describes only the export of the source system in detail. For the installation of the target system, you use the **installation guide** for the database and operating system platform of your

target system. This procedure describes only the additional system copy-specific steps for the target system installation and refers for the remaining steps to the target system [installation guide \[page 22\]](#).

In the following, we refer to this guide as the “installation guide”.

## Procedure

1. Prepare the target system host as described in the **installation guide** for the operating system and database platform intended for the target system.
2. Start the software provisioning manager as described in the **installation guide** for the operating system and database platform intended for the target system.

### ⚠ Caution

If you plan to use Advanced Configuration options during the SAP System Database Import, make sure you have installed the most current version of the software provisioning manager to avoid performance problems during the [Define Parameters](#) phase. You can find the latest version of the software provisioning manager at:

<http://support.sap.com/sltoolset> ➤ [System Provisioning](#) ➤ [Download Software Provisioning Manager](#) ➤

### i Note

If you are running a system copy with parallel export/import using the migration monitor with the R3load socket option and started the export with command line option **SUPPORT\_DECLUSTERING=false** (see [System Copy Procedure \[page 59\]](#)), you must now start the software provisioning manager for the installation of the target database instance with command line option **SUPPORT\_DECLUSTERING=true** for the import during the target system installation.

3. On the [Welcome](#) screen, navigate to the following folder according to the requirements of your target system: ➤ [<Product>](#) ➤ [<Database>](#) ➤ [System Copy](#) ➤ [Target System](#) ➤ [<System\\_Variant>](#) ➤ [Based on AS ABAP](#) ➤.
4. Run the installation options required for your target system in the sequence they are listed in the specific folder and according to process flow in [System Copy Procedure \[page 59\]](#)

### ⚠ Caution

Note that after completing the ➤ [<Product>](#) ➤ [<Database>](#) ➤ [System Copy](#) ➤ [Target System](#) ➤ [<System\\_Variant>](#) ➤ [Based on AS ABAP](#) ➤ [Database Instance](#) ➤ option, you must subsequently run the ➤ [<Product>](#) ➤ [<Database>](#) ➤ [System Copy](#) ➤ [Target System](#) ➤ [<System\\_Variant>](#) ➤ [Based on AS ABAP](#) ➤ [Primary Application Server Instance](#) ➤ option as well. Otherwise you run the risk that the installed system is in an inconsistent state, because if you do not run the ➤ [<Product>](#) ➤ [<Database>](#) ➤ [System Copy](#) ➤ [Target System](#) ➤ [<System\\_Variant>](#) ➤ [Based on AS ABAP](#) ➤ [Primary Application Server Instance](#) ➤ option, some mandatory ABAP reports that are integrated in this option have not been executed in the primary application server instance.



To install the target system, follow the instructions in the software provisioning manager input screens ([Define Parameters](#) phase) and enter the required parameters.

If you need to perform some [follow-up activities in the target system \[page 121\]](#) **before** it is started by the software provisioning manager, make sure that on the [Parameters Settings](#) screen you choose parameter mode [Custom](#). Then the software provisioning manager will display the [Actions Before SAP System Start](#) screen, where you can choose [Interrupt before starting the SAP system](#).

#### ⚠ Caution

**Heterogeneous system copy:** When installing the database instance, you either have to choose parameter mode [Custom](#) or have to check the [Database Import](#) screen on the summary screen and then revise this screen. Only then appears the screen where you can enter the migration key, which is required for a heterogeneous system copy. If you forget to revise this screen setting during the [Define Parameters](#) phase, the software provisioning manager will abort in the processing phase when checking the migration key and will ask you for a valid migration key.

#### ⚠ Caution

- If you perform a Unicode conversion, the data import into the target system might abort because of missing space in the database `tablespace` or `dbspace`. Enlarge the database or database container, in which the table will be created in the target database. The required size for the table will be 15 times larger than in the non-Unicode source system.
- Do **not** create the installation directory (for example: `sapinst_instdir`) in the following directories:
  - `/usr/sap/<SAPSID>`
  - `/sapmnt/<SAPSID>`

- If you want to perform export processes in parallel to import processes and you have prepared the export, you must do the following:
    - Choose [Custom](#) on the [Parameter Mode](#) screen.
    - Select [Parallel Export and Import](#) on the [SAP System Database Import](#) screen.
  - On the [SAP System Database](#) screen, choose [Standard System Copy/Migration \(Load-Based\)](#). The SAP data dump from the migration export media that was created during the database instance export is loaded in the newly installed SAP system database.
  - When the software provisioning manager displays the [Media Browser](#) screen and prompts for the [Export Location](#), enter the path to the export directory `<EXPDIR>`.
  - If you perform a heterogeneous system copy, enter the Migration Key on the [Database Import](#) screen.
5. Complete the installation as described in the installation documentation for your SAP component.
- If you have to restart the import after an error, just restart the software provisioning manager. The import continues with the table that has not yet been successfully imported.
  - If you have to restart failed `R3load` processes, see [Restarting R3load Processes \[page 100\]](#).
  - You can use the `Migration Checker` tools to ensure that the import has been performed successfully. The `package checker` and the `object checker` automatically check that the import has started and that all objects have been imported. In addition, you can use the `table checker` tool to verify that the number of rows that have been exported is equal to the number of rows in the database by using the table of content (`TOC`) files. For more information about the `table checker`, see SAP Note [2009651](#). For more information about all these checks see the [Migration Checker](#)

*User Guide*. It is contained in the MIGCHECK.SAR archive as MigrationChecker.pdf and is available in the following directory of the software provisioning manager:

<Path\_To\_Unpack\_Directory>/COMMON/INSTALL/MIGCHECK.SAR

- As an alternative to the table checker, you can perform [Table Comparison with Software Update Manager \(SUM\) \[page 163\]](#).

Proceed as follows:

1. Make sure that the primary application server instance is not started after the import has finished successfully.  
If your system is based on SAP NetWeaver 7.4 or higher, you can mark the check box *Interrupt installation before starting the SAP system* on the screen *Actions Before SAP System Start* to ensure this.
2. [Run table comparison \[page 165\]](#)
3. Start the instances of the target system.

### Note

If you have to restart failed R3load processes, see [Restarting R3load Processes \[page 100\]](#).

You can use the Migration Checker to ensure that the import has been performed successfully. The Migration Checker automatically checks that the import has started and that all objects have been imported. For more information about additional checks with the Migration Checker, see the *Migration Checker User Guide* contained in the MIGMON.SAR archive, which is available in the following directory:

You can use the Migration Checker tools to ensure that the import has been performed successfully. The package checker and the object checker automatically check that the import has started and that all objects have been imported. In addition, you can use the table checker tool to verify that the number of rows that have been exported is equal to the number of rows in the database by using the table of content (TOC) files. For more information about the table checker, see SAP Note [2009651](#). For more information about all these checks see the *Migration Checker User Guide*. It is contained in the MIGCHECK.SAR archive as MigrationChecker.pdf and is available in the following directory of the software provisioning manager:

<Path\_To\_Unpack\_Directory>/COMMON/INSTALL/MIGCHECK.SAR

## Related Information

[Additional Considerations for the Migration to SAP HANA Database \(Import\) \[page 107\]](#)

## 4.1.8.2.1 Additional Considerations for the Migration to SAP HANA Database (Import)

Before you start the import for the migration to SAP HANA, consider the following:

### Declustering

If you are using parallel export/import with the Socket Mode option, declustering has to take place during the import. For this, no direct action is required from you, as the latest versions of software provisioning manager and migration monitor adapt the procedure automatically.

### Log Mode

Before the import, make sure that the log mode is set to overwrite (which is the initial value of the log mode after the initial setup of the database until a first data backup has been performed) to avoid a “disk full” situation.

If data backups already exist for this instance, you can set the log mode back to overwrite by changing the parameter `log_mode` from `normal` to `overwrite` and restarting the database, so that the new parameter becomes active.

### Tuning of SAP HANA Data Load Performance

To improve the performance of SAP HANA INSERTs and data loads, consider the area about savepoints and corresponding parameter settings listed in section *How can the performance of INSERTs and data loads be tuned?* of SAP Note [2000002](#).

### Table Placement

For scale-out systems, download the relevant `TABLE_PLACEMENT` text file that is attached to an SAP Note. The relevant SAP Note for your application and SAP HANA revision is documented in **SAP Note** [1900822](#). You should then use the `TABLE_PLACEMENT` text file as parameter file for software provisioning manager during the import. For additional information about table placement and landscape redistribution see the blog *SAP HANA Landscape Redistribution with SP6* in the SAP Community Network at: <http://scn.sap.com/community/hana-in-memory/blog/2013/09/03/sap-hana-landscape-redistribution-with-sp6>

## Check Parameters for Dynamic Adjustment of Load Jobs

Especially for SAP HANA, the migration monitor comprises a `migmonctrl.jar` add-on that gets invoked automatically to adjust the amount of `R3load` jobs dynamically during the import. For this purpose, the add-on maintains the `ORDER_BY.TXT` file, which is read by migration monitor every 30 seconds to start new jobs. The adjustment is necessary because most of the tables need to be organized (merged) in memory before they can be flushed to the disk. Therefore, an additional amount of memory is necessary.

In general, all packages of an export are distributed over three groups inside the `ORDER_BY.TXT` file:

- `[Large]`  
Group Large contains the biggest packages sorted by size from biggest to smallest.
- `[Small]`  
Group Small contains the smaller packages sorted by size from smallest to biggest. As migration monitor starts the jobs according to the number of jobs defined for one group top-down, the first table of group Large (the biggest) is loaded together with the first of group Small (the smallest). Due to this, SAP HANA memory is used more efficiently.
- `[Rowstore]`  
This group contains packages that only contain one row-store table – that is, tables not listed here are column-store tables. Row-store tables always stay in the memory (also after import), whereas column-store tables are merged, compressed and synchronized to disk after import, which reduces memory consumption.  
The Rowstore group is loaded at the end of the import to avoid interferences with column-store tables.

The add-on has parameters that you can adjust in the `MIGMONCTRL_CMD.PROPERTIES` file. Check these parameters and if required, adjust them according to your situation. These are the most important parameters:

```
# Maximum number of R3load jobs defined in groups Large and Small.
maximumJobNum=100
# Factor of safety used to multiply the current size of all running
jobs. The number of jobs is increased as long as enough free space is available
within HANA.
memoryFactor=2
# Initial value for the number of R3load jobs for group Large. The value
is also the minimum to which the number of jobs will be decreased.
initialLargeJobNum=5
# Initial value for the number of R3load jobs for group Small. The value
is also the minimum to which the number of jobs will be decreased.
initialSmallJobNum=5
# If set to true migmonctrl stops to do changes to the order_by.txt.
pause=false
# Number of R3load jobs used for group Rowstore.
jobNumRowstore=33
# If set to true Rowstore tables are put in a separate group named
Rowstore. R3load jobs for this group are started after the last table specific
package has finished.
loadRowstoreSeparate=true
```

You can change the parameters also while migration monitor is running, because they are read every 5 seconds by default.

To check the add-on version, run the following command:

```
./sapjvm/sapjvm_6/bin/java -jar migmonctrl.jar -V
```

Log files of the add-on are `MIGMONCTRL.LOG` and `MIGMONJOBBER.CONSOLE.LOG`.

## Using an SAP HANA Standby Server for the Import of SAP Business Warehouse

If scale-out is released for your product, consider to use an SAP HANA standby server node for the import to improve performance.

To achieve this, perform a *Distributed System* installation as follows:

1. Perform a Distributed System installation.
2. Install the ASCS instance on the SAP system host.
3. Perform the Database Instance installation (including data import) on the SAP HANA standby node:
  1. As a prerequisite, copy the profiles directory `/sapmnt/<SAPSID>/profile` from the SAP server, create user `<sapsid>adm` and group `sapsys` with the same IDs as on the ASCS instance host and change the owner of the copied profile directory to `<sapsid>adm:sapsys`.
  2. You can use default settings (*Typical Mode*), but should consider to enable parallel export and import, if released for your product (see above). You do not need to start the `migration monitor` manually.
  3. Enter the path to the newest kernel from SAP Service Marketplace.
4. Install the primary application server Instance on the SAP system host.

## Analysis of Import

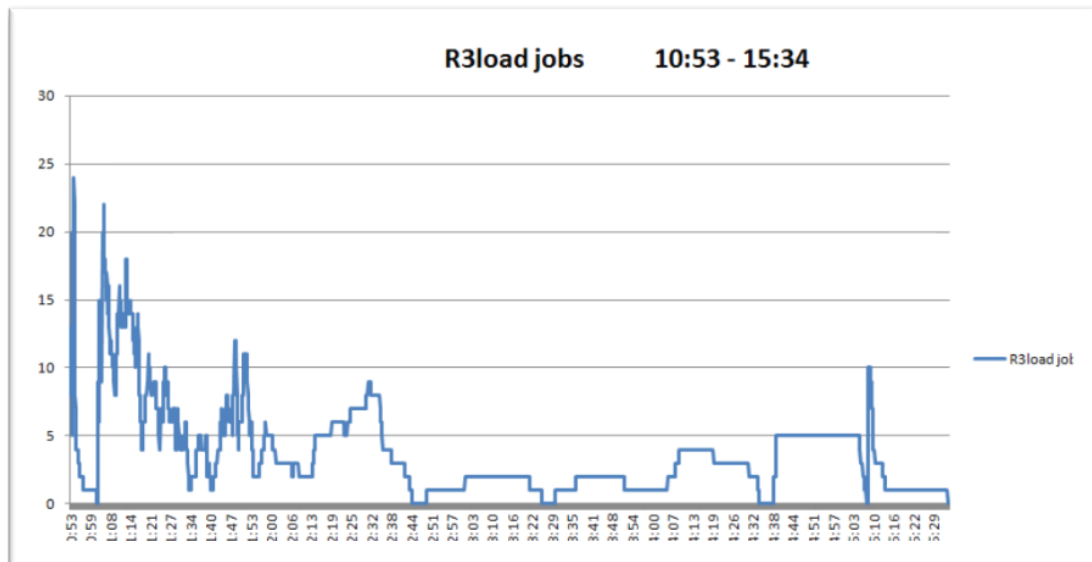
For further analysis after the import and optimization of further import runs, you can use the files `R3LOAD_JOBS.CSV`, `FREE_MEMORY.CSV`, `SAVEPOINT_STATISTIC.CSV` and `CPU_USAGE.CSV`.

### ❖ Example

The easiest way to use these files is to import them into Microsoft Excel, for example:

1. Open the csv file in Microsoft Excel and mark all relevant values until the import has stopped.  
If you are in doubt, check the import log file for the exact time.
2. Choose **Insert > Line > Line**.
3. In the inserted diagram, right-click on the values from the horizontal (category) axis and select *Format Axis ...*.
4. In the shown *Axis Options* dialog, select the *Text axis* value for the *Axis Type* parameter.

Result would be a diagram like the one taken from the example in the Appendix of this documentation:



## Troubleshooting

- If you want to use virtual host names, see SAP Note [2141442](#) (SAP HANA client software: hdbuserstore not found when using virtual host names).
- If you create a system copy of an SAP system based on SAP NetWeaver 7.40 SP5 or higher, in which the ABAP source search is active (switch: `SRIS_SWITCH_SOURCE_SEARCH`), see SAP Note [2031638](#) (R3load terminates during creation of an index for a field of the type LOB).
- For potential problems during the installation of scale-out systems, see SAP Note [2041412](#) (Error during initial landscape redistribution during migration)
- For migrations on the AIX platform, see SAP Note [1976256](#) (AIX: TCP/IP connections hang)

# 5 Database-Specific System Copy

The following sections describe the database-specific methods for the system copy.

## i Note

When performing a system copy using a database-specific method, it is **not** required to run the software provisioning manager in the source system to export it. You only have to run the software provisioning manager on the target host to install the target system.

## Process

Follow the sequence of steps described in the process flows below for a:

- Standard system
- Distributed system
- High-availability system

## Standard System

## i Note

When performing a system copy using a database-specific method, it is not required to run the software provisioning manager in the source system to export it. You only have to run the software provisioning manager on the target host to install the target system.

## Process Flow on the Target System

## i Note

For the target system installation, you use the [installation guide \[page 22\]](#) for your target operating system and database.

In the following we refer to this documentation as “installation guide”.

1. Start the software provisioning manager as described in the installation guide and follow the instructions on the software provisioning manager screens until you are requested to perform the database backup/restore.

## i Note

If required, you have to restart the software provisioning manager as described in the installation guide.

2. To complete the system copy, you [perform the follow-up activities \[page 119\]](#).

## Distributed System or High Availability System

### i Note

When performing a system copy using a database-specific method, it is no longer required to run the software provisioning manager in the source system to export it. You only have to run the software provisioning manager on the target host to install the target system.

## Process Flow on the Target System

### i Note

For the target system installation, you use the [installation guide \[page 22\]](#) for your target operating system and database.

In the following we refer to this documentation as “installation guide”.

To complete the system copy, you [perform the follow-up activities \[page 119\]](#).

## 5.1 SAP HANA Database-Specific Procedure

This section describes how to perform a homogeneous system copy of a SAP HANA database.

### Procedure

Perform the steps described in SAP Note [1844468](#) .



## 6 Copying Single Instances Only

If you want to copy single instances of your SAP system only, you can use one of the following procedures, depending on your use case.

### ⚠ Caution

You **cannot** copy single product instances, usage types, or components!

### i Note

This system copy guide describes only the export of the source system in detail. For the installation of the target system, you use the **installation guide** for the database and operating system platform of your target system. This procedure describes only the additional system copy-specific steps for the target system installation and refers for the remaining steps to the target system [installation guide \[page 22\]](#).

#### [Copying the Primary Application Server Instance Only \[page 113\]](#)

With this procedure, you can move a primary application server instance to a different host within your system.

#### [Copying the Database Only – Move Database Instance \[page 114\]](#)

This section is about how to **move** a database instance to a different host within your system. Depending on your database, you can perform the move using either database-specific methods or the SAP standard method based on `R3LOAD`.

#### [Copying the Database Only – Refresh Database Instance \[page 115\]](#)

Using option *Refresh or Move Database Instance* you can refresh an existing database **instance** - that is a new database instance is installed - without having to copy the primary application server instance and to reinstall additional applications servers. You can perform the refresh using either database-specific methods or the SAP standard method based on `R3LOAD`.

#### [Copying the Database Only – Refresh Database Content \[page 117\]](#)

Using the *Refresh Database Content* option in the software provisioning manager you can refresh the **content** of an existing database **using a database backup**. You do **not** have to copy the primary application server instance and to reinstall additional applications servers.

### 6.1 Copying the Primary Application Server Instance Only

With this procedure, you can move a primary application server instance to a different host within your system.

#### Prerequisites

The ABAP central services instance (ASCS instance) is installed.

## Procedure

1. Shut down all application servers.
2. Uninstall the old primary application server instance as described in the *Additional Information* section of the installation guide .
3. On your **target** host, start the software provisioning manager as described in [Running Software Provisioning Manager \[page 81\]](#) .
4. On the *Welcome* screen, navigate to the following folder according to the requirements of your target system:

► <Product> ► <Database> ► *System Copy* ► *Target System* ► *Distributed System or High-Availability System* ► *Based on <Technical Stack>* ► *Primary Application Server Instance* ►.

5. After the installation has finished, restart all additional application server including the instance services.

## 6.2 Copying the Database Only – Move Database Instance

This section is about how to **move** a database instance to a different host within your system. Depending on your database, you can perform the move using either database-specific methods or the SAP standard method based on `R3load` .

### ⚠ Caution

Use Software Provisioning Manager de-clustering only when you perform a system copy of the entire system. The source system must be de-clustered / de-pooled.

## Context

“Move” means moving the database instance to a different host to refresh the database content. The procedure below describes the database-independent method, which is not feasible for all databases. For using database-specific methods, see [Database-Specific System Copy \[page 111\]](#).

If you only want to “refresh” the database content with the database instance staying on the same host, use either the procedure described in [Copying the Database Only – Refresh Database Instance \[page 115\]](#) or the procedure described in [Copying the Database Only – Refresh Database Content \[page 117\]](#)

For more information, see <https://blogs.sap.com/2017/03/02/refresh-database-content-without-reinstalling-the-database-or-kernel-for-abap-systems/> 📄

### i Note

- Consider the following:
  - The <DBSID> must not be changed.
  - When copying the database only, you cannot change to another database but need to perform a database-homogeneous copy.

- The old database instance cannot be uninstalled using the software provisioning manager-based uninstall procedure. This always deletes the current database of the system.

## Procedure

1. On the **source** host, run the software provisioning manager to perform the export in one of the following ways:
  - If you perform the export using `R3load`, on the *Welcome* screen, choose **<Product>** **> <Database>** **> System Copy** **> Source System** **> Based on AS ABAP** **> Database Instance Export** **>** to export the database.
  - If you perform the export using database-specific tools, you must start them manually.
2. On the **target** host, stop all SAP application server instances, but leave the ASCS instance running.
3. On the target system, run the software provisioning manager and choose **<Product>** **> <Database>** **> System Copy** **> Target System** **> <System\_Variant>** **> Based on AS ABAP** **> Database Refresh or Move** **>** to install the database.

### Note

Since the target database instance is to replace the source database, do not change the **<DBSID>**.

4. When the software provisioning manager has completed the installation of the database, restart your system including all instance services.
5. Shut down the old database instance.

## Related Information

[Running Software Provisioning Manager \[page 81\]](#)

## 6.3 Copying the Database Only – Refresh Database Instance

Using option *Refresh or Move Database Instance* you can refresh an existing database **instance** - that is a new database instance is installed - without having to copy the primary application server instance and to reinstall additional applications servers. You can perform the refresh using either database-specific methods or the SAP standard method based on `R3load`.

## Prerequisites

- The source system and the target system already exist.
- You must prepare the kernel media and the RDBMS media as described in section *Preparing the Installation Media* in the [installation guide \[page 22\]](#).
- As a post-step during the refresh database instance, the software provisioning manager connects to the target SAP system via remote function call (RFC). Since the certificates are from the source system, make sure that secure network communications (SNC) is turned off for the RFC, or at least that the insecure RFC connection is allowed. This is only necessary during the short time of the post-processing steps, and after they are completed, you can turn SNC back on.

### ⚠ Caution

Use Software Provisioning Manager de-clustering only when you perform a system copy of the entire system. The source system must be de-clustered / de-pooled.

## Context

This procedure implies a “refresh of the database instance” using kernel and RDBMS media with the database instance staying on the same host.

If you want to “move” the database instance to a different host, use the procedure described in [Copying the Database Only – Move Database Instance \[page 114\]](#).

If you want to only refresh the database content using a database backup - that is without using kernel and RDBMS media, and without installing a new database instance - use the procedure described in [Copying the Database Only – Refresh Database Content \[page 117\]](#)

For more information, see <https://blogs.sap.com/2017/03/02/refresh-database-content-without-reinstalling-the-database-or-kernel-for-abap-systems/> 

## Procedure

- On the **source** system, perform the export in one of the following ways:
  - If you perform the export using R3load, start the software provisioning manager and on the *Welcome* screen choose **<Product>** **>** **<Database>** **>** *System Copy* **>** *Source System* **>** *Based on AS ABAP* **>** *Database Instance Export* **>** to export the database.
  - If you perform the export using database-specific tools, you must start them manually.
- On the **target** host, stop all SAP application server instances, but leave the ASCS instance running.
- Run the software provisioning manager and choose **<Product>** **>** **<Database>** **>** *System Copy* **>** *Target System* **>** **<System\_Variant>** **>** *Based on AS ABAP* **>** *Database Refresh or Move* **>** to install the database.

## Related Information

[Running Software Provisioning Manager \[page 81\]](#)

## 6.4 Copying the Database Only – Refresh Database Content

Using the [Refresh Database Content](#) option in the software provisioning manager you can refresh the **content** of an existing database **using a database backup**. You do **not** have to copy the primary application server instance and to reinstall additional applications servers.

### i Note

System copy option [Refresh Database Content](#) is currently **not** released for SAP SCM.

## Prerequisites

- The source system and the target system already exist.
- As a post-step during the refresh database content, the software provisioning manager connects to the target SAP system via remote function call (RFC). Since the certificates are from the source system, make sure that secure network communications (SNC) is turned off for the RFC, or at least that the insecure RFC connection is allowed. This is only necessary during the short time of the post-processing steps, and after they are completed, you can turn SNC back on.

### ⚠ Caution

Use Software Provisioning Manager de-clustering only when you perform a system copy of the entire system. The source system must be de-clustered / de-pooled.

## Context


You must choose the same schema name for the target system as the schema name of the export or database backup. However, you can choose a different instance number.

We recommend that you use option [Refresh Database Content](#) if you need to equalize the database content of two or more already existing and configured systems, for example in automatized system landscapes with “template” systems which have to correspond to precisely defined standards, such as predefined host names, network settings, users, security policies.



## i Note

If you want to “move” the database instance to a different host, use the procedure described in [Copying the Database Only – Move Database Instance \[page 114\]](#).

If you want to “refresh” the complete database instance - then you need kernel and RDBMS media to install a new database instance - use the procedure described in [Copying the Database Only – Refresh Database Instance \[page 115\]](#)

For more information, see <https://blogs.sap.com/2017/03/02/refresh-database-content-without-reinstalling-the-database-or-kernel-for-abap-systems/> 

## Procedure

1. Perform a database backup as described in the *SAP HANA Administration Guide* at [http://help.sap.com/hana\\_platform](http://help.sap.com/hana_platform) ►► [System Administration](#) .
- Make sure that the database backup is accessible from the database host.
2. On the SAP system host, stop all SAP application server instances, but leave the ASCS instance running.
3. On the application server instance host, run the software provisioning manager and choose ► [Generic Options](#) ► [SAP HANA Database](#) ► [Refresh Database Content](#) .
- Follow the instructions on the software provisioning manager screens. You are prompted for the following:
  - The `<DBSID>` of the target system.
  - The profile directory of your SAP system.
  - The location of the database backup.
  - The database administrator password for the backup.  
this is the SYSTEM user's password of the SAP HANA database where the database backup has been created.

# 7 Follow-Up Activities

To finish the system copy of your SAP system, you have to perform follow-up activities in the source and target system.

## i Note

**SAP systems based on SAP NetWeaver 7.4 and higher only:** You can perform some of the ABAP system configuration tasks listed in this section in an automated way by using predefined task lists. For more information, see the installation and configuration guides for ABAP post-copy automation at [https://help.sap.com/viewer/p/ABAP\\_POST-COPY\\_AUTOMATION](https://help.sap.com/viewer/p/ABAP_POST-COPY_AUTOMATION).

### [Performing Follow-Up Activities in the Source System \[page 119\]](#)

This section describes the follow-up steps that you have to perform in the source system after the target system installation has completed.

### [Performing Follow-Up Activities in the Target System \[page 120\]](#)

To complete the system copy process, you need to perform several follow-up activities on the target system.

## Related Information

[Performing Follow-Up Activities in the Source System \[page 119\]](#)

[Performing Follow-Up Activities in the Target System \[page 120\]](#)

## 7.1 Performing Follow-Up Activities in the Source System

This section describes the follow-up steps that you have to perform in the source system after the target system installation has completed.

### Procedure

1. Reschedule released jobs.

If you stopped scheduling of released jobs and of jobs that must run periodically before you started the system copy procedure, release them again by running report BTCTRNS2. For more information, see [General Technical Preparations \[page 45\]](#).

2. Using CCMS, adapt your operation mode timetable to the original status (transaction SM37).

## 7.2 Performing Follow-Up Activities in the Target System

To complete the system copy process, you need to perform several follow-up activities on the target system.

### **i** Note

Make sure that you also complete the post-installation steps contained in the [installation guide \[page 22\]](#). This system copy guide describes only the system copy-specific steps that are required in addition.

[Activities at Operating System Level \[page 120\]](#)


This section includes the adaptations that you have to make at operating system level in your target system.

[Performing Follow-Up Activities for ABAP \[page 121\]](#)

### 7.2.1 Activities at Operating System Level

This section includes the adaptations that you have to make at operating system level in your target system.

#### Procedure

1. Adapt the configuration files at operating system level to meet network and SAP requirements.
2. Adapt additional SAP software components (for example, RFC, CPIC, SAP ArchiveLink) if required.
3. Adapt additional non-SAP software components (for example, archiving systems, monitoring tools, job schedulers) if required.
4. Adapt backup programs (for example, BRBACKUP, BRARCHIVE, BACKINT) if required.
5. Adapt non-SAP directories, file systems, NFS mounts, and so on, if required.
6. Check the SAP parameters of the default and instance profiles.
7. Check your UNIX shell files for special entries.
8. Check `crontab` or AT jobs.
9. Check operating system files (for example, `.netrc`, `.rhosts`).
10. Check operating system printers.
11. If the spool requests are stored at file system level, you must copy the subdirectories with the spool files to the new global directory. For more information, see SAP Note [20176](#) .



## 7.2.2 Performing Follow-Up Activities for ABAP

### i Note

Make sure that you also complete the post-installation steps contained in the [installation guide \[page 22\]](#). This system copy guide describes only the system copy-specific steps that are required in addition.

[General Follow-Up Activities \[page 121\]](#)

[Activities at SAP System Level \[page 123\]](#)

This section includes the adaptations that you have to make at SAP system level in your target system.

[Product-Specific Follow-Up Activities \[page 128\]](#)

[Checking the Target System \[page 130\]](#)

The following actions are required for checking the consistency of the target system.

[Additional Activities After the Migration to SAP HANA \[page 130\]](#)

### 7.2.2.1 General Follow-Up Activities

### i Note

Make sure that you also complete the post-installation steps contained in the [installation guide \[page 22\]](#). This system copy guide describes only the system copy-specific steps that are required in addition.

#### 7.2.2.1.1 Activities at Database Level

This section includes the adaptations that you have to make at database level in your target system.

### Procedure

1. Before starting the SAP system, make sure that the logging mechanism of the database is active.
2. Check the parameters in the database profiles.
3. Delete all entries from the following tables: ALCONSEG, ALSYSTEMS, DBSNP, MONI, OSMON, PAHI, SDBAD, SDBAP, SDBAR.
4. Delete entries in the table DDLOG for buffer synchronization.
5. If your source database was **SAP MaxDB**, run report RSSDBTICMCLEANUP on the target system. This will delete data that is related to the source system.

## 7.2.2.1.2 Installing the SAP License Key

Once the installation of the target system is completed, you have to install a new SAP license key.

You must install a **permanent** SAP license. When you install your SAP system, a **temporary** license is automatically installed.

For more information about ordering and installing the SAP license, see the [SAP Library \[page 22\]](#) for your release at:

### i Note

Navigate to the SAP Help Portal page for the SAP NetWeaver release your SAP product is based on as described in section [Accessing the SAP Library \[page 22\]](#), and then continue the navigation as described below.

#### SAP Release and SAP Library Quick Link

- SAP NetWeaver 7.3 including Enhancement Package 1

<http://help.sap.com/nw731>

- SAP NetWeaver 7.4

<http://help.sap.com/nw74>

- SAP NetWeaver 7.5

<http://help.sap.com/nw75>

- SAP NetWeaver Application Server for ABAP 7.51 innovation package

<https://help.sap.com/nw751abap>

- SAP NetWeaver AS for ABAP 7.52

<https://help.sap.com/nw752abap>

#### SAP Library Path (Continued)

▶ [Application Help](#) ▶ [SAP NetWeaver Library: Function-Oriented View](#) ▶ [Solution Life Cycle Management](#) ▶ [SAP Licenses](#) ▶

## More Information

For more information about how to order permanent SAP license keys, see <https://support.sap.com/licensekey>.

### 7.2.2.1.3 SAP Solution Manager: Connection Between SLD and LMDB

For an SAP Solution Manager system, check the connection between System Landscape Directory (SLD) and Landscape Management Database (LMDB).

- Consider the following if you move parts of a system, for example the database, or the complete system to new hardware:
  - Each change in the host name generates new elements in the system landscape directory (SLD) which can result in system duplicates.
  - SAP recommends using stable (virtual) host names which remain constant over time, in the system profiles. SAP Note [1052122](#) lists the profile parameters evaluated by the SLD Data Suppliers for the host names.
- If you omitted to use virtual host names at installation time or if you cannot use virtual host names now, the SLD offers a possibility to prevent the creation of system duplicates. For more information, see SAP Note [1727294](#).
- If you cannot apply SAP Note [1727294](#) to the SLD, and if you already found a duplicate registration for the system in the SLD, refer to SAP Note 1694004 for guidance how to clean up such inconsistencies. SAP Note [1747926](#) describes the cleanup procedure for older SLD releases.
- If you want to copy an SAP Solution Manager system with a filled Landscape Management Database (LMDB), see SAP Note [1797014](#).
- If you want to create a new synchronization connection between the Landscape Management Database (LMDB) and the System Landscape Directory (SLD), see SAP Note [1699142](#).
- If you want to delete a synchronization connection between two SLD systems or between an SLD system and LMDB, see SAP Note [1770691](#).

## 7.2.2.2 Activities at SAP System Level

This section includes the adaptations that you have to make at SAP system level in your target system.

### i Note

You can use ABAP post-copy automation (PCA) to automatically perform follow-up activities at system level. ABAP post-copy automation (PCA) provides task lists with a predefined sequence of configuration tasks to configure extensive technical scenarios automatically. For more information, see SAP Note [1614266](#).

To be able to use PCA, you must install the license for SAP Landscape Virtualization Management Enterprise Edition. For more information, see SAP Note [1912110](#).

## Procedure

1. If you performed a Unicode conversion using as target system ID the same **<SAPSID>** as the source system ID and the (local or NIS-mounted) operating system users of the target system still have the

environment of the operating system users of the source system, you need to update the user environment for the operating system users of the target system as follows:






Update the `PATH` variable so that it points to the platform-specific directory for Unicode.



### ❖ Example

Update the `PATH` value `/usr/sap/<SAPSID>/SYS/exe/nuc/linuxx86_64` to `/usr/sap/<SAPSID>/SYS/exe/uc/linuxx86_64`

2. Run an installation check (transaction SM28).
3. Delete all entries from the tables TPFET and TPFHT (transaction SE14).

These tables contain information about changes made to the profile of your source system.
4. Import the system profiles into the database (transaction RZ10).
5. If you changed the SAP system ID during the system copy, delete all entries from table TLOCK, which holds the repair requests from your source system.
6. Maintain the operation modes.
  - a. Create new operation modes and instance definitions (transaction RZ04).
  - b. Maintain the time table using the new operation modes (transaction SM63).
  - c. Delete the old operation modes and old instance definitions.
7. Adapt other CCMS settings (for example, alert thresholds, reorganization parameters of CCMS table MONI) if required.
8. Check the logon groups and the assignment of the application servers to the logon groups (transaction SMLG).

If required, create new logon groups and assign the new application servers to these logon groups.
9. Define or remove the SAP system users and revise the authorizations of the system users:  **Tools**  
 **Administration**  **User maintenance**  **Users** (transaction SU01).
10. Synchronize the buffers as described in SAP Note [36283](#)  and adapt the client information for the logical system.
11. Configure the spool server.
  - a. Adapt the definition of the printers to meet the new system requirements (transaction SPAD):
    - Device types and character set definitions
    - Spool server
    - Output management systems (OMS)
  - b. Delete obsolete spool requests and spool inconsistencies while executing the ABAP program RSP00041 (transaction SE38).
  - c. Call transaction SP12 and run report RSP01043 for a spool data consistency check.

For more information, see SAP Notes [98065](#)  and [48400](#) .
12. Configure batch jobs.
  - a. Delete canceled and finished batch jobs while executing the RSBTCDEL ABAP program, selecting *Delete with forced mode* (transaction SE38).
  - b. Adapt all jobs needed in the target system.
13. If you have used the DBA Calendar in the source system, redefine database actions (backup, update statistics, and so on) (transaction DB13).
14. Maintain the security configuration.

- a. Call transaction `STRUST`.
- b. Replace all existing PSE files in the target system with new ones, which contain the new system's information.

For more information, see the [SAP Library \[page 22\]](#) for the SAP NetWeaver release your SAP system is based on at:

### **i Note**

Navigate to the SAP Help Portal page for the SAP NetWeaver release your SAP product is based on as described in section [Accessing the SAP Library \[page 22\]](#), and then continue the navigation as described below.

► [Security](#) ► [System Security](#) ► [System Security for SAP NetWeaver AS ABAP Only](#) ► [Trust Manager](#) ► [Creating PSEs and Maintaining the PSE Infrastructure](#) ► [Creating or Replacing a PSE](#) ►

### **i Note**

- Since replacing a PSE will remove all of the previously used certificates, also import all necessary trusted certificates into the new PSE's certificate list. (Check the old PSE's certificate list.) Distribute the new PSE's public-key certificate to the systems where it will be used.
- Make sure the new PSE contains the new system ID.
- Note the naming conventions to use for each PSE. The naming conventions are usually specified by the Certification Authority (CA) where you obtain the certificate, however, the type of PSE also has some restrictions, for example, for the SSL server PSE, the CN part of the Distinguished Name must be the host name used to access the server. For the system PSE, we recommend using the SID as the CN part.  
Therefore, make sure that the Distinguished Name used for the PSE conforms with the naming convention that applies.

#### 15. Adapt RFC server groups.

Call transaction `RZ12` and change the instance name of RFC server groups under [Group assignment](#).

#### 16. Adapt RFC destinations copied from the source system to the target system.

### **⚠ Caution**

Before you delete RFC destinations, make sure that they are not needed in the target system.

- a. To check and adapt qRFC destination, call transaction `SMQR`.
- b. To check and adapt tRFC destination, call transaction `SM58`.
- c. To delete obsolete RFC destinations, call transaction `SM59`.

#### 17. [Check the ABAP Secure Store \[page 127\]](#)

#### 18. Configure the Transport Management System (TMS).

- a. Reschedule the transport dispatcher (`RDDIMPDP`) in client 000:
  1. Log on as user `DDIC`.
  2. Call transaction [SE38](#).
  3. Run program `RDDNEWDP` and set the priority to high.
- b. Adapt the transport parameters and transport routes in the TMS as follows:

1. Call transaction **STMS**.
2. To adapt the transport parameters, choose ► [Overview](#) ► [Systems](#) ► [<your system>](#) ► [Transport Tool](#) ►.
3. To adapt the transport routes, choose ► [Overview](#) ► [Transport Routes](#) ►.
4. Configure the domain controller in the Transport Management System (TMS) by using transaction STMS.

### i Note

If you did not change the SAP system ID during the system copy, all open transport, repair, and customizing requests that have not been released in the source system will not be released automatically.

19. Make data archived in the source system (data that does not reside in the database but was moved to a different storage location using SAP Archive Management) accessible in the target system. Adapt the file residence information in the target system. For more information, see [Constraints \[page 20\]](#) and the [SAP Library \[page 22\]](#) for your release at:

► [Solution Life Cycle Management](#) ► [Data Archiving](#) ►

20. Check self-defined external commands (transaction SM69).
21. Check the logical system names. For more information, see [Preparations \[page 45\]](#). If you need to change logical system names in the system that results from the copy, change the logical system names at this time, as described in SAP Notes [103228](#) and [544509](#). Follow your corporate naming strategy for logical systems when making this change.
- BW only:** If you have copied an SAP BW system, see SAP Note [886102](#).
22. For every client in your SAP system check the detail settings (client role, changes and transports for client-dependent objects, changes for client-independent objects, protection level, restrictions) (transaction SCC4).
23. Check if you can delete clients that are no longer used in the target system (transaction SCC5).
24. Check the contexts and segments of remote application servers for the SAP Monitoring Infrastructure if required (transaction RZ21).
25. Post-processing for customer objects:

- If customer objects are not original in the new system, use transaction SE06 to modify the corresponding entries in table TADIR.
- If you encounter problems modifying a customer development class using transaction STMS or SM31, try using the option [Validate](#) (ENTER) instead of the option [Save](#) to save your changes.

26. **BW only:** Start program RS\_BW\_POST\_MIGRATION in the background. Program RS\_BW\_POST\_MIGRATION performs necessary modifications on database-specific objects (mainly BW objects).

If you changed the database management system (for example, IBM i to MaxDB) when copying the system, you have to start program RS\_BW\_POST\_MIGRATION in the background with variant SAP&POSTMGRDB

### i Note

If you changed the database management system to SAP HANA database, use variant SAP&POSTMGRHDB

27. Generate the ABAP load.

The ABAP loads are platform-dependent programs that are generated during runtime and stored in database tables. They are not exported when you use the R3load procedure to copy your SAP system. The ABAP loads are generated in the target system when they are first used.

#### **i Note**

Make sure that you have sufficient space available on your database. The generation of all existing objects requires about 2 to 9 GB of free space.

For a detailed description about how to generate the ABAP load, call transaction `SGEN` and choose [Information about the SAP Load Generator](#).

## **Related Information**

[Checking the ABAP Secure Store \[page 127\]](#)

### **7.2.2.2.1 Checking the ABAP Secure Store**

#### **Procedure**

1. Start transaction `SECSTORE`.
2. Choose [Check Entries](#) and [Execute](#).
3. Filter the result by error messages.


Depending on the SAP NetWeaver release your SAP system is based on, you have to proceed in one of the following ways:

- Your SAP system is based on an **SAP NetWeaver release lower than 7.40**:
  - If you see at least one error message of type [SECSTORE 030](#) (“*Incorrect global key for entry ...*”), proceed as follows:
    1. Restore a legacy key-file that was used in the source system.  
You can find information about this process in the [SAP Library \[page 22\]](#) for your release at:

#### **i Note**

Navigate to the SAP Help Portal page for the SAP NetWeaver release your SAP product is based on as described in section [Accessing the SAP Library \[page 22\]](#), and then continue the navigation as described below.

► [Function-Oriented View](#) ► [Security](#) ► [System Security](#) ► [System Security for SAP NetWeaver AS ABAP Only](#) ► [Secure Storage \(ABAP\)](#) ► [Importing Keys after a System Copy](#) ►

2. Repeat the check.
- If you see at least one error message of type [SECSTORE 031](#) (“*System-dependent data for entry ... changed: ...*”), you must perform a record migration.  
You can find information about this process in **SAP Note 816861** .

- Your SAP system is based on **SAP NetWeaver 7.40 or higher**:
  - If you see at least one error message of type *SECSTORE 089* (“*Key ... for entry ... is missing in the secure storage in the file system*”), proceed as follows:
    1. Reimport encryption keys that were used in the source system and stored in the secure storage in the file system  
You can find information about this process in the [SAP Library \[page 22\]](#) for your release at:

#### i Note

Navigate to the SAP Help Portal page for the SAP NetWeaver release your SAP product is based on as described in section [Accessing the SAP Library \[page 22\]](#), and then continue the navigation as described below.


► [Function-Oriented View](#) ► [Security](#) ► [System Security](#) ► [System Security for SAP NetWeaver AS ABAP Only](#) ► [Secure Storage \(ABAP\)](#) ► [Key Management](#) ► [Using Individual Encryption Keys](#) ► [Importing Missing Encryption Keys](#) ►

2. Repeat the check.
- If you see at least one error message of type *SECSTORE 030* (“*Incorrect global key for entry ...*”), you need to restore a legacy key-file that was used in the source system.  
You can find information about this process in the [SAP Library \[page 22\]](#) for your release at:

#### i Note

Navigate to the SAP Help Portal page for the SAP NetWeaver release your SAP product is based on as described in section [Accessing the SAP Library \[page 22\]](#), and then continue the navigation as described below.

► [Function-Oriented View](#) ► [Security](#) ► [System Security](#) ► [System Security for SAP NetWeaver AS ABAP Only](#) ► [Secure Storage \(ABAP\)](#) ► [Key Management](#) ► [Legacy Method for Using Individual Encryption Key](#) ► [Importing Keys after a System Copy](#) ►

- If you see at least one error message of type *SECSTORE 031* (“*System-dependent data for entry ... changed: ...*”), you must perform a record migration.  
You can find information about this process in **SAP Note 816861** .

## 7.2.2.3 Product-Specific Follow-Up Activities

### Related Information

[Business Warehouse \(BW\) Specific Follow-Up Activities \[page 129\]](#)  
[Embedded Search \[page 129\]](#)



### 7.2.2.3.1 Business Warehouse (BW) Specific Follow-Up Activities

This section provides references to documentation describing how to perform BW-specific follow-up activities.

Perform the BW-specific follow-up activities as described at:

- <https://blogs.sap.com/2016/10/11/software-application-lifecycle-management-sap-bw/>
- [https://rapid.sap.com/bp/#/RDS\\_RDBMS\\_4\\_BW](https://rapid.sap.com/bp/#/RDS_RDBMS_4_BW) ► *Solution Deployment: Configuration Guide of the SAP Rapid Deployment Solution "Rapid Database Migration of SAP NetWeaver BW to SAP HANA"* ►

If you have migrated to SAP HANA database, convert your BW InfoProvider to SAP HANA-optimized objects.

For more information, see the [SAP Library \[page 22\]](#) for your release at:

► *SAP NetWeaver Library: Function-Oriented View* ► *Business Warehouse* ► *Data Warehousing* ► *Modeling* ► *Architected Data Mart Layer* ► *Creating InfoCubes* ► *SAP HANA-Optimized InfoCube* ► *Converting Standard InfoCubes to SAP HANA-Optimized + DSO + SPO* ►

### 7.2.2.3.2 Embedded Search

This section includes the steps that you have to perform to connect TREX with the ABAP target system.

#### Prerequisites

You have applied SAP Note [1293026](#).

#### Procedure

##### i Note

After the migration to SAP HANA database, the connection to TREX/BWA does not work. To fix this, add the prefix **:RFC:** to the TREX/BWA RFC destination in table ESH\_ADM\_TREX. For example: **:RFC:TREX\_123**

1. To establish the connection between TREX and the ABAP target server, run the script `configureTrexRfcConnection.py` on the host where TREX is installed.
2. On the ABAP server, perform the following steps:
  - a. To delete copied search object connectors, call transaction SE38. Run the report ESH\_ADM\_INDEX\_ALL\_SC with option *Delete*.
  - b. Call transaction SE16 to find out the TREX destination from table ESH\_ADM\_TREX.
  - c. Call transaction SM59 to delete the program ID of the TREX destination. TREX retrieves the correct new program ID automatically.

### i Note

If you have applied SAP Note [1303185](#), program ESH\_ADM\_INDEX\_ALL\_SC automatically deletes the program ID of the TREX destination.

- d. Create new search object connectors.

For more information, see the [SAP Library \[page 22\]](#) for your release at:

### i Note

Navigate to the SAP Help Portal page for the SAP NetWeaver release your SAP product is based on as described in section [Accessing the SAP Library \[page 22\]](#), and then continue the navigation as described below.

► [Search](#) ► [Search Services in SAP NetWeaver AS ABAP](#) ► [Embedded Search](#) ► [Setting Up Embedded Search](#) ► [Creating Connectors](#) ►

## 7.2.2.4 Checking the Target System

The following actions are required for checking the consistency of the target system.

### Procedure

1. Perform an initial consistency check (transaction SM28).
2. Check the system log on **all** application servers (transaction SM21). In case of warnings, see [SAP Note 43434](#).
3. Check the consistency of the database (transaction DB02).
4. Perform a server check (transaction SM51).
5. FI customers: Run the job SAPPF190 (accounting reconciliation) and compare the results to those gained on the source system before the system copy (► [Accounting](#) ► [Financial Accounting](#) ► [General ledger](#) ► [Periodic Processing](#) ► [Closing](#) ► [Check/count](#) ► [Comparison](#) ►).
6. FI customers: Run the jobs RFUMSV00 (tax on sales/purchases), RAGITT01 (asset history sheet), RAZUGA01 (asset acquisitions), and RAABGA01 (fixed asset retirements) and compare the results to those gained on the source system before the system copy.
7. CO customers: Run the report group 1SIP and compare the results to those gained on the source system before the system copy.

## 7.2.2.5 Additional Activities After the Migration to SAP HANA

## Related Information

[Performing Consistency Checks \[page 131\]](#)

[Additional Post-Processing After Migrations to SAP Business Warehouse on SAP HANA \[page 131\]](#)

### 7.2.2.5.1 Performing Consistency Checks

This section describes how to perform consistency checks.

#### Context

To verify that the import has been performed successfully, the software provisioning manager performs `Package Checker` and `Object Checker` runs as part of the default procedure. In addition, you can manually perform the `Table Checker` – for more information, see **SAP Note 784118**.

- The `Package Checker` is used to verify that the import of all packages was at least started.
- The `Object Checker` is used to verify that all objects (tables, views, indexes, primary keys) are successfully created or loaded into the database.
- The `Table Checker` is used to verify if the number of rows been exported is the same as the number of rows in the database (not usable in Socket mode).

#### Procedure

Proceed as follows to run the `Table Checker` manually:

1. Download `MIGCHECK_<Version>.SAR` from SAP Service Marketplace at: <https://launchpad.support.sap.com/#/softwarecenter> > *Support Packages and Patches* > *By Category* > *Additional Components* > *SYSTEM COPY TOOLS GEN* > *SYSTEM COPY TOOLS GEN <Release>* > *OS independent*.
2. Proceed as described in the *Migration Checker Users' Guide* that is part of the archive downloaded above.

### 7.2.2.5.2 Additional Post-Processing After Migrations to SAP Business Warehouse on SAP HANA

The following additional post-processing steps are only required after migrations to SAP Business Warehouse (SAP BW) on SAP HANA.

- Before performing other post-processing activities, run the ABAP report `RS_BW_POST_MIGRATION` as documented in the system copy guide.

- Run the ABAP report `RSBU_TABLE_CONSISTENCY` to identify potential problems, such as with database indexes, table partitioning, table distribution, and table classification. For more information about using report `RSBU_TABLE_CONSISTENCY`, see **SAP Note** [1937062](#).  
Before you run the report, make sure that you applied all **SAP Notes** listed in the attachment `REQUIRED_CORRECTION_NOTES.TXT` of **SAP Note** [1908075](#).
- **SAP Note** [1695112](#) provides additional information about post-processing steps in SAP BW after the migration to the SAP HANA database.
- If you migrated an SAP BW 7.31 system to an SAP HANA database, apply the SAP Notes listed in the collective **SAP Note** [1846493](#) before you start using your SAP BW system productively.
- If you migrated an SAP BW 7.4 system to an SAP HANA database, apply the SAP Notes listed in the collective **SAP Note** [1949273](#) before you start using your SAP BW system productively.

# 8 Additional Information

## Related Information

[R3load Procedures Using the Migration Monitor \[page 133\]](#)

[Analysis of the Export and Import Times \[page 163\]](#)

[Table Comparison with Software Update Manager \[page 163\]](#)

[Using the Package Splitter \[page 167\]](#)

[Troubleshooting for Migration to SAP HANA \[page 173\]](#)

## 8.1 R3load Procedures Using the Migration Monitor

This section contains user documentation about the migration monitor system copy tool.

[About the Migration Monitor \[page 134\]](#)

This section lists the functions and features of the migration monitor.

[Configuration \[page 135\]](#)

[Assigning DDL Files to Packages \[page 151\]](#)

[Defining Groups of Packages \[page 152\]](#)

[Processing Split Tables \[page 153\]](#)

If tables have been split during the export, ensure before the import starts that the table exists (only once) and that the primary key and the indexes are created (only once) before or after (as defined in the DDL template) the table data has been imported. These tasks are automatically synchronized by the migration monitor.

[Starting the Migration Monitor \[page 154\]](#)

[Using the migmonCtrl Add-On for the Export \[page 159\]](#)

[Using the migmonCtrl Add-On of the Import Migration Monitor \[page 161\]](#)

[Output Files \[page 162\]](#)

## 8.1.1 About the Migration Monitor

This section lists the functions and features of the migration monitor.

### Purpose

The migration monitor does the following:

- Creates R3load command files
- Creates R3load task files if required
- Starts R3load processes to unload the data
- Transfers packages from source to target host if required
- Starts R3load processes to load data as soon as a package is available
- Informs the person performing the system copy in the event of errors

#### Note

An up-to-date version of the load tools - such as R3load, R3szchk, R3ldctl, SAPuptool - which were available so far only in the SAPEXEDB\_<...>.SAR archive of the kernel media, has now been made available in the software provisioning manager archive (software provisioning manager10SP<Support\_Package\_Number>\_<Version\_Number>.SAR), in a sub-archive named LOADTOOLS.SAR, located in the COMMON/LOADTOOLS folder. For a system copy using kernel version 7.40 or higher, the load tools from the software provisioning manager10SP<Support\_Package\_Number>\_<Version\_Number>.SAR are used **automatically** instead of the loadtools available in the SAPEXEDB\_<...>.SAR archive of the kernel media. **There is no action required from your side**, the software provisioning manager uses the relevant loadtools automatically once you run it from the extracted software provisioning manager10SP<Support\_Package\_Number>\_<Version\_Number>.SAR archive. For more information, see SAP Note [2472835](#).

The migration monitor is integrated in the software provisioning manager, but it is also possible to start the migration monitor manually with the corresponding option in the software provisioning manager. To do this, you require a properties file.

#### Caution

For all SAP systems based on SAP NetWeaver 7.0 and higher, you can use the socket option without restrictions.

For more information about how to start the migration monitor manually, see [Starting the Migration Monitor \[page 154\]](#).

When you start the migration monitor manually:

- You can adjust any parameters. For more information, see [Configuration \[page 135\]](#).
- You gain flexibility – for example, you can repeat, test and abort runs of the migration monitor.
- The process becomes more complex since it requires many additional manual activities.
- The properties file has to be created manually.

## → Recommendation

Reuse an existing properties file from previous runs of software provisioning manager as template.

## Tool

The tool is located in the `MIGMON.SAR` SAPCAR archive. The archive file contains the following:

- Scripts:
  - `export_monitor.sh / export_monitor.bat`
  - `import_monitor.sh / import_monitor.bat`
  - `res_check.sh / res_check.bat`
  - `import_dirs.sh / import_dirs.bat`
- jar archives:
  - `migmon.jar`
  - `rescheck.jar`
  - `activation.jar`
  - `mail.jar`
- Property files:
  - `export_monitor_cmd.properties`
  - `import_monitor_cmd.properties`
- `migmonCtrl` add-on:
  - Scripts
    - `dyn_control_export_monitor.sh / dyn_control_export_monitor.bat`
    - `dyn_control_import_monitor.sh / dyn_control_import_monitor.bat`
  - jar archives
    - `migmonctrl.jar`
  - Property files:
    - `migmonctrl_cmd.properties`

## Prerequisites

The correct directory structure for R3load dump files must exist on both the source and target hosts.

## 8.1.2 Configuration

The following options can be specified using the property file or using the command line. Command line parameters take precedence over parameters specified in the property file. Options are case-sensitive, that is, options that are not recognized are ignored.

## Help

With the following command line options, the tool displays all parameters available: **-help, -?**

## Version

With the following command line option, the tool displays version information: **-version**

## General Options

### General Options

Name	Description	Comment
<b>monitorTimeout</b>	Monitor timeout in seconds	During a timeout, the monitor thread sleeps and does not analyze any files or analyze its processing state. The default timeout value is 30 seconds.

### Additional Options

Name	Description	Name
<b>bg</b>	Enables background mode	<b>Takes effect only as command line option</b>  If the tool is running in background mode, the UNIX shell windows or Windows command prompt can be closed after startup.
<b>secure</b>	Enables secure mode	<b>Takes effect only as command line option</b>  If the tool is running in secure mode, command line parameters (for example, passwords) are hidden for Java processes. Secure mode implicitly enables background mode.  <b>i Note</b>  Use this mode if you have to specify passwords on the command line.
<b>trace</b>	Trace level	Possible values:  <b>all, off, 1</b> (error), <b>2</b> (warning), <b>3</b> (info), <b>4</b> (config, default), <b>5, 6, 7</b> (trace)



## Export Monitor – Options



### Export Options

Option	Description	Comment
<b>installDir</b>	Installation directory	Directory where the software provisioning manager 1.0 is started. If you run the Migration Monitor without using the software provisioning manager, the installation directory is the directory where the <b>R3load TSK</b> and log files are written.
<b>exportDirs</b>	List of export directories	<p>Separator on Windows: “;”</p> <p>Separator on UNIX, IBM i: “:”</p> <p>The <b>exportDirs</b> parameter points to the directory where the <b>R3load</b> dump files are written. In the <b>exportDirs</b> directory, the subdirectories <b>DATA</b>, <b>DB</b>, and <b>DB / &lt;TARGET_DBTYPE&gt;</b>. For example, <b>DB/ORA</b> must exist.</p>
<b>client</b>	Client operating mode	Running in client mode means that the migration monitor runs parallel to standard software provisioning manager export process and transfers the exported dump files to the import server.
<b>server</b>	Server operating mode	Running in server mode means that the migration monitor creates <b>R3load TSK</b> files (if necessary), <b>R3load cmd</b> files, and starts the <b>R3load</b> processes.
All options below are for <b>server mode</b> . The import monitor always runs in server mode. If you want to run the export monitor in server mode, specify the <b>server</b> parameter in the properties file of the export monitor.		
<b>orderBy</b>	Package order	Can be the name or path of the file that contains package names. If the option value is omitted, package order is not determined.
<b>ddlFile</b>	DDL control file	<p>Path or filename of DDL control file</p> <p>The default is <b>DDL&lt;DBTYPE&gt;.TPL</b>.</p> <p>If the filename is used without a path, the DDL control file from the export <b>DB</b> subdirectory is used.</p>
<b>ddlMap</b>	DDL mapping file	File with mapping between <b>DDL</b> files and package names
<b>r3loadExe</b>	Path of the <b>R3load</b> executable	Optional; default is <b>R3load</b> . If only the name of the <b>R3load</b> executable is available, the <b>JVM</b> looks for the <b>R3load</b> executable using operating system-specific process search rules.

Option	Description	Comment
<b>tskFiles</b>	<b>yes</b> to create task files; <b>no</b> to skip	Up to and including version 4.6, this must be set to <b>no</b> ; as of version 4.7 set to <b>yes</b> . If the <b>R3load</b> task files * .TSK already exist, the monitor does not overwrite them.
<b>dataCodepage</b>	Code page for data files	See SAP Note <a href="#">552464</a> . Possible values: <b>4102</b> , <b>4103</b> , <b>1100</b>
<b>taskArgs</b>	Additional <b>R3load</b> arguments for the <b>TASK</b> phase	Appended to the <b>R3load</b> command line  Options already set by the monitor: <b>-ctf</b> ; <b>-l</b>
<b>loadArgs</b>	Additional <b>R3load</b> arguments for the <b>LOAD</b> phase	Appended to the <b>R3load</b> command line. Options already set by the monitor: <b>-e</b> ; <b>-datacodepage</b> ; <b>-l</b> ; <b>-p</b> ; <b>-r</b> ; <b>-socket</b> (if the socket option is specified); <b>-o</b> (if the omit argument is specified and task files are not used, that is, the value of the <b>tskFiles</b> option is <b>no</b> ).
<b>jobNum</b>	Number of parallel export jobs, default: <b>1</b>	Any positive number  The value can be changed dynamically at runtime.
<b>decluster</b>  (use this option only for target <b>dbType = HDB</b> )	Default value is <b>false</b>	Possible values : <b>true</b> or <b>false</b>  If this option is <b>true</b> , the migration monitor calls <b>R3load</b> with option <b>-decluster</b> .
<b>firstExportSAPNTAB</b>	Default values is <b>false</b>	Possible values: <b>true</b> or <b>false</b>  If this option is true, the migration monitor first exports the <b>SAPNTAB</b> package in single thread mode.
<b>onlyProcessOrderBy</b>		If set to <b>true</b> only the jobs from file configured with <b>orderBy</b> are processed.


#### Network Exchange Options

Option	Description	Comment
<b>net</b>	Network operating mode	Exported dump files must be visible on the import host to use this mode.

Option	Description	Comment
<b>netExchangeDir</b>	Network exchange directory	<div>  <b>Caution</b>  Clean up the <b>netExchangeDir</b> before starting a new export. </div> <p>Used for communication between the export and import monitors. Must be writable for the export monitor and readable for the import monitor. The export monitor writes a <b>&lt;Package&gt;.SGN</b> file to the network exchange directory as a signal to the import monitor that the package has been exported successfully and that the import can be started.</p>
FTP Exchange Options		
Option	Description	Comment
<b>ftp</b>	FTP operating mode	Exported dump files are transferred automatically from the source host (directory <b>exportDirs</b> ) to the target host (directory <b>importDirs</b> ) using FTP.
<b>ftpHost</b>	Remote FTP host	Name or IP address of the import server
<b>ftpUser</b>	Name of the remote FTP user	The FTP user specified here should be <b>&lt;sapsid&gt;adm</b> to make sure that the package files can be read during the import (which is started as <b>&lt;sapsid&gt;adm</b> ).
<b>ftpPassword</b>	Password of the remote FTP user	<div>  <b>Caution</b>  Security risk. </div> <p>For more information, see the <b>secure</b> parameter in section <i>Additional Options</i>.</p>

Option	Description	Comment
<b>ftpExportDirs</b>	List of remote FTP directories for export dump	Both “;” and “:” separators are valid. This is the directory on the target host to which the dump is transferred. The value is the same as for <b>importDirs</b> in the properties file of the import monitor.
<b>ftpExchangeDir</b>	Remote FTP exchange directory	Used for communication between the export and import monitors.  Must be writable for the export monitor and readable for the import monitor.  <div>⚠ <b>Caution</b> Clean up the <b>ftpExchangeDir</b> before starting a new export.</div> The export monitor writes a <b>&lt;Package&gt;.SGN</b> file to the FTP exchange directory as a signal for the import monitor that the package is exported successfully and that the import can be started.
<b>ftpJobNum</b>	Number of parallel FTP jobs; the default is <b>1</b> .	Any positive number; <b>0</b> for an unlimited number of jobs  The value can be changed dynamically at runtime.
Export Socket Host		
Option	Description	Comment
<b>socket</b>	Socket operating mode	<b>R3load</b> does not write dump files to the file system but the export and import work through the socket connection.
<b>host</b>	Remote import host	Name or IP address of the import host.
<b>port</b>	Host port number	Must be the same as the port number on the import host. Any free port on the import host from <b>1024</b> to <b>65535</b> .

## FTP Copy Options

Option	Description	Comment
<b>ftpCopy</b>	FTP copy operating mode	Used as a separate program call for migration with sockets if no share directory is used. All files produced by <b>R3ldctl</b> and <b>R3szchk</b> are transferred from the source to the target host using FTP.
<b>exportDirs</b>	List of export directories	<p>Separator on Windows: ";"</p> <p>Separator on UNIX, IBM i: ":"</p> <p>In the <b>exportDirs</b> directory, the subdirectories <b>DATA</b>, <b>DB</b>, and <b>DB/&lt;TARGET_DBTYPE&gt;</b> (for example, <b>DB/ORA</b>) must exist. The <b>R3load STR</b> files have to exist in the subdirectory <b>DATA</b>, the <b>DDL*.TPL</b> files in the subdirectory <b>DB</b>, and the <b>R3load EXT</b> files (if required) in the subdirectory <b>DB/&lt;TARGET_DBTYPE&gt;</b>.</p>
<b>ftpHost</b>	Remote <b>FTP</b> host	Name or IP address of the import server
<b>ftpUser</b>	Name of the remote <b>FTP</b> user	The <b>FTP</b> user specified here must be <b>&lt;sapsid&gt;adm</b> to make sure that the package files can be read during the import (which is started as <b>&lt;sapsid&gt;adm</b> ).
<b>ftpPassword</b>	Password of the remote <b>FTP</b> user	<div>  <b>Caution</b> Security risk </div>
<b>ftpExportDirs</b>	List of remote <b>FTP</b> directories for export dump	Both ";" and ":" separators are valid. This is the directory on the target host to which the dump is transferred. The value is the same as for <b>importDirs</b> in the properties file of the import monitor.

Any other option is ignored by the export monitor.

## Export Options for the “migmonCtrl” Add-On

The **migmonctrl** add-on was developed to improve the performance of the export by offering new export strategies.

These are the following:

- “export by size”  
The **\*.EXT** files are used.
- “export by runtime”.  
The information is taken from the migration time analyzer output file **export\_time.txt**. If you also did an import already, you can add the **import\_time.txt** file as well. The additional options are added to the **export\_monitor\_cmd.properties** file.

Option	Description	Comment
<b>migmonCtrl</b>	Enabling the add-on	-
<b>orderBy</b>	File with package order	<p>If <b>migmonCtrl</b> is set, the file is created dynamically. It still has the same format as the <b>order_by</b> file, which you can create manually.</p> <p>If it is created by the add-on, the file has two groups called <b>LARGE</b> and <b>SMALL</b>.</p> <p>Depending on the sort order (size or runtime), the packages are listed from <b>biggest/longest</b> to <b>smallest/shortest</b> in group <b>LARGE</b> and from smallest to biggest in group <b>SMALL</b>. Therefore the biggest and smallest packages are exported together. This ensures that the biggest tables are exported right from the beginning but also that input is provided to the import side by exporting the smallest table.</p>
<b>jobNumLarge</b>	Amount of jobs set in group <b>LARGE</b>	The number can be changed during runtime.
<b>jobNumSmall</b>	Amount of jobs set in group <b>SMALL</b>	<p>The number can be changed during runtime.</p> <p>To keep up the number of <b>jobNumLarge</b> + <b>jobNumSmall</b>, packages from group <b>LARGE</b> are moved into group <b>SMALL</b> when the number of unprocessed packages in group <b>SMALL</b> becomes smaller than <b>jobNumSmall</b>.</p> <p>In addition to that, <b>jobNumSmall</b> is increased when the number of unprocessed packages in group <b>LARGE</b> becomes smaller than <b>jobNumLarge</b>.</p>
<b>customSortOrderFile</b>	-	<p>If certain jobs need to be exported right from the start, they can be configured in this file.</p> <pre>SAPAPPL0_24_1 REPOSRC T100 /BIC/ MYBWTABLE</pre>

#### Export by Size

Option	Description	Comment
<b>extFileDir</b>	Absolute path of <b>EXT</b> files generated by <b>R3szchk</b>	Mandatory if the export is to be sorted by size

## Export by Runtime

Option	Description	Comment
<b>exportTimeFile</b>	Absolute path of file <b>export_time.txt</b> created by <b>migtime.jar</b>	Mandatory if the export is to be sorted by runtime
<b>importTop</b>	Amount of analyzed packages used from file <b>import_time.txt</b>	Can only be used if parameter <b>importTimeFile</b> is set  For parallel export/import, long running jobs on the import side need to be exported first.  The <b>importTop</b> option adds the long running jobs on top of group <b>LARGE</b> .
<b>importTimeFile</b>	Absolute path of file <b>import_time.txt</b> created by <b>migtime.jar</b>	Optional

## Package Filter Files

With package filter files you can distribute the export over several servers. To use this feature you have to create the filter files first. This requires a separate run of the migration monitor. For this you can temporarily add the following options to the **export\_monitor\_cmd.properties** file or simply add them to the command line.

### Creating Package Filter Files

Option	Description	Comment
<b>createPackageFilter</b>		Needs to be set to create package filter files.
<b>excludePackage</b>	Comma separated string	Packages that must not be included in the filter file
<b>outputFile</b>	<b>package_list_%hostName%.txt</b>	Location and name of result files  <b>%hostName%</b> is replaced with the actual name of the host.
<b>hostNames</b>	Comma separated string	The names are only used for the file name:  <b>&lt;outputFile&gt;_&lt;hostName&gt;.txt</b>

## Using Package Filter Files

Option	Description	Comment
<code>onlyProcessOrderBy</code>	-	If this option is set to <b>true</b> , only the jobs from <b>orderBy</b> file are processed.
<code>packageFilter</code>	<code>package_list_%hostName%.txt</code>	File that contains packages used for the export. This can be used if the export is to be executed on multiple hosts.
<code>netStatisticsFile</code>	<code>package_filter_%hostName%.statistics</code>	If <b>parallel export/import</b> is chosen, this file is created when the migration monitor has finished all jobs from the package list.

## Mandatory Options for the Export Monitor

- Client mode:  
`installDir`, `exportDirs`,  
one of the options **ftp**, **net** (and their related parameters)
- Server mode:  
`installDir`, `exportDirs`, `tskFiles`,  
one of the options **ftp**, **net**, **socket** (and their related parameters)
- FTP copy:  
`exportDirs`, `ftpHost`, `ftpUser`, `ftpExportDirs`, `ftpExchangeDir`

### Note

The value of the **dbType** option is determined automatically in the shell script or batch files from the **dbms\_type** environment variable.


## Import Monitor – Options

### Import Options

Option	Description	Comment
<code>installDir</code>	Installation directory	<p>The installation directory is the directory in which the installation tools (<b>software provisioning manager 1.0.R3SETUP</b>) are started.</p> <p>When you run the migration monitor without using the installation tools, the installation directory is the directory where the <b>R3load TSK</b> and log files are created.</p>



Option	Description	Comment
<b>importDirs</b>	List of import directories	<p>Separator on Windows: “;”</p> <p>Separator on UNIX, IBM i: “:”</p> <p>The <b>importDirs</b> parameter points to the directory where the R3load dump files are written. In the <b>importDirs</b> directory, the subdirectories <b>DATA</b>, <b>DB</b>, and <b>DB/&lt;TARGET_DBTYPE&gt;</b> (for example, <b>DB/ORA</b>) must exist.</p>
<b>orderBy</b>	Package order	<p>This option is used only if the import monitor works without the export monitor in standalone mode, that is, all export dump files are available on the import host before the import monitor is started.</p> <p>Values can be:</p> <ul style="list-style-type: none"> <li>• <b>name:</b> Load packages in alphabetical order</li> <li>• <b>size:</b> Load packages starting with the largest one or a path of the file that contains the package names</li> </ul> <p>If the option is omitted then the package order is not defined.</p>
<b>ddlFile</b>	<b>DDL</b> control file	<p>Path or file name of <b>DDL</b> control file</p> <p>The default is <b>DDL&lt;DBTYPE&gt;.TPL</b>. If the file name is used without path, the <b>DDL</b> control file from the export DB subdirectory is used.</p>
<b>ddlMap</b>	<b>DDL</b> mapping file	File with mapping between <b>DDL</b> files and package names
<b>r3loadExe</b>	Path of the <b>R3load</b> executable	<p>Optional; default is <b>R3load</b>.</p> <p>If only the name of the <b>R3load</b> executable is available, the <b>JVM</b> looks for the <b>R3load</b> executable using operating system-specific search rules for the process.</p>
<b>tskFiles</b>	<p><b>yes</b> to create task files;</p> <p><b>no</b> to skip</p>	<p>Before version 4.6, this must be set to <b>no</b>.</p> <p>Starting from version 4.7, it must be set to <b>yes</b>.</p> <p>If the <b>R3load</b> task files <b>*.TSK</b> already exist, the monitor does not overwrite them.</p>

Option	Description	Comment
<b>extFiles</b>	<b>yes</b> to include <b>EXT</b> files; <b>no</b> to skip them	Add <b>EXT</b> file entries to <b>cmd</b> files.  If the <b>EXT</b> files cannot be found in the <b>DB/</b> <b>&lt;TARGET_DBTYPE&gt;</b> import dump subdirectory, the package processing is aborted.
<b>dbCodepage</b>	Database code page for the target database	See <b>SAP Note 552464</b>  .  Possible values are: <b>4102, 4103, 1100</b>
<b>migrationKey</b>	Migration key	-
<b>omit</b>	<b>R3load</b> omit value	<p>Can contain only <b>DTPIVAFLMU</b> letters.</p> <p><b>-omit D</b>: omit data; do not load data</p> <p><b>-omit T</b>: omit tables; do not create tables</p> <p><b>-omit P</b>: omit primary keys; do not create primary keys</p> <p><b>-omit I</b>: omit indexes; do not create indexes</p> <p><b>-omit V</b>: omit views; do not create views.</p> <p><b>-omit A</b>: omit AMDPs; do not create ABAP managed procedures</p> <p><b>-omit F</b>: omit flexible objects; do not create flexible ob- jects (database functions, database filter rules, session var- iables)</p> <p><b>-omit L</b>: omit flexible indexes; do not create flexible in- dexes, for example SAP HANA inverted hash indexes</p> <p><b>-omit M</b>: omit merge; do not merge table after data load</p> <p><b>-omit U</b>: omit unload; do not unload table after data load</p> <p>If you want to combine several <b>-omit</b> options, list these options without blank, for example <b>-omit TV</b>.</p> <p>Alternatively, option <b>-include</b> can be used to specify a positive list of task types, which have to be executed (any unspecified task types are omitted):</p> <p><b>-include &lt;task-type-list&gt;</b></p> <p>The <b>-include</b> option supports the same list of tasks as the <b>omit</b> option. For example, <b>-include TDPIMU</b> gen- erates tasks to create tables (T), load data (D), create a primary index (P), to create secondary index (I), to merge delta log (M), and to finalize load (+U).</p>

Option	Description	Comment
<b>taskArgs</b>	Additional <b>R3load</b> arguments for the TASK phase	<p>Appended to the <b>R3load</b> command line</p> <p>The following options are already set by the monitor:</p> <p><b>-ctf; -l; -o</b> (if the omit argument is specified).</p>
<b>loadArgs</b>	Additional <b>R3load</b> arguments for the <b>LOAD</b> phase	<p>Appended to the <b>R3load</b> command line</p> <p>The following options are already used by the monitor:</p> <p><b>-i; -dbcodepage; -l; -p; -k; -r; -socket</b> (if the socket option is specified);</p> <p><b>-o</b> (if the omit argument is specified and task files are not used, that is, the value of <b>tskFiles</b> option is <b>no</b>).</p>
<b>jobNum</b>	Number of parallel import jobs; the default is <b>1</b> .	<p>Any positive number; <b>0</b> for an unlimited number of jobs</p> <p>You can change the value dynamically at runtime.</p>
<b>decluster</b> (use this option only for target <b>dbType = HDB</b> )	false	<p>Possible values : <b>true</b> or <b>false</b></p> <p>If this option is true – migmon calls R3load with option –decluster.</p>
<b>ignorePackageSizeCalculation</b>	Default is false	<p>Possible values : <b>true</b> or <b>false</b></p> <p>Use this option if you see performance issue in the time before starting the first import jobs. The first task of the Migration Monitor is to collect all packages that are mentioned in the table line for the <b>importDirs</b> parameter.</p> <p>In this first step, called <b>CollectPackages</b>, the migration monitor also calculates the package size. If the packages are spread over many mounted locations this can take some time. To improve the performance of the <b>CollectPackages</b> step, set this option to <b>true</b>. Later the packages are imported without following “size ordering” of packages. Use this option only if there is a big delay during the start of the first import jobs.</p>

Option	Description	Comment
<code>collectLogicalPackages</code>	Default is false	<p>Possible values : <code>true</code> or <code>false</code> Import migration monitor is extended with this option for processing “logical” packages.</p> <p>To one standard package corresponds either one <code>STR</code> or one <code>WHR</code> file (for example, <code>SAPAPPL1.STR</code>, <code>REPOSRC-1.WHR</code>).</p> <p>To one “logical” package corresponds either one <code>STR.logical</code> or one <code>WHR.logical</code> file (for example <code>SAPCLU4.STR.logical</code>, <code>SAPCDCLS-1.WHR.logical</code>). The logical packages are located in the same directory where the standard packages are located, for example <code>importDirs/ABAP/DATA</code>. Set this option to <code>true</code> if an import is running on SAP HANA database (HDB) and an export was run with the <code>decluster=true</code> option.</p>

#### Import Exchange Options

Option	Description	Comment
<code>exchangeDir</code>	Exchange directory	<p>If this option is not set, the monitor runs in standalone mode, that is, without the export monitor. All the export dump files or the SAP export media from the installation kit must be available on the import host and be specified with the <code>importDirs</code> parameter (for example, in the properties file).</p> <p>If there is an old <code>export_statistics.properties</code> file (for example, from a previous export run), remove this file.</p>

#### Import Socket Options

Option	Description	Comment
<code>socket</code>	Socket operating mode	-
<code>port</code>	Server port number	Any free port from <code>1024</code> to <code>65535</code> .

Any other option is ignored by the import monitor.

## Mandatory Options for Import Monitor

- Server mode (default):  
`installDir`, `importDirs`, `tskFiles`, `extFiles`, one of the options `exchangeDir` or `socket` (and their related parameters)

- Standalone mode:  
`installDir, importDirs, tskFiles, extFiles`
- IBM i-specific:  
`loadArgs= -nojournal`

### i Note

The value of the `dbType` option is determined automatically in the shell script or batch files from the `dbms_type` environment variable.

## Dynamic Control of Import Monitor for the SAP HANA database

The `migmonCtrl` add-on (`migmonctrl.jar`) was created to dynamically adjust the load of the SAP HANA database during the import. It measures the load of the database in short intervals and makes adjustments to the `order_by.txt` file. The migration monitor uses the `orderBy` option in this scenario and starts new `R3load` jobs accordingly.

### Options for the MigmonCtrl Add-On

The following options are set in file `import_monitor_cmd.properties` or can be added on the command line.

Option	Description	Comment
<code>username</code>	User name of database user	-
<code>password</code>	Password of the database user	-
<code>host</code>	Database host	-
<code>instanceNumber</code>	Instance number in two-digit format	The instance number must be in two-digit format, for example <code>02</code> .
<code>createTablesOnly</code>	Special mode for <code>Landscape Reorg</code> scenario	This option is used for the first step in the <code>Landscape Reorg</code> scenario when the migration monitor creates all tables without importing any data.

### Options for File `migmonctrl_cmd.properties`

`MigmonCtrl` creates a file `migmonctrl_cmd.properties` during startup if it does not exist. It reads through the file during every 5 seconds. Parameters can be changed during the run to manually do adjustments to the configuration.

Option	Description	Comment
<b>loadRowstoreSeparate</b>	Load <b>Rowstore</b> tables after the <b>Columnstore</b> tables	Default is set to false.  This parameter is only read once during startup.
<b>memoryFactor</b>	Factor to multiply the size of running <b>R3load</b> jobs to have a memory cushion in the database for Merge operations	By default this value is set to 2.
<b>initialLargeJobNum</b>	Initial and minimum number of <b>R3load</b> jobs for group <b>Large</b>	By default this value is set to 5.
<b>initialSmallJobNum</b>	Initial and minimum number of <b>R3load</b> jobs for group <b>Small</b>	By default this value is set to 5.
<b>smallJobWeight</b>	Factor to calculate the ratio between number of jobs in group <b>Large</b> and <b>Small</b>	By default this value is set to 6.  This means when the number of jobs in group <b>Large</b> is increased by 1, 6 jobs must be added to group <b>Small</b> before the number of jobs in group <b>Large</b> is increased again.
<b>coreMultiplier</b>	Factor to calculate the maximum number of <b>R3load</b> jobs	By default this value is set to 4.  Deprecated
<b>maximumJobNum</b>	Maximum number of jobs in total	By default this value is set to 100. Only jobs from group <b>Large</b> , <b>Small</b> and <b>Rowstore</b> are taken into account.  The number of jobs the migration monitor starts in total might be slightly higher than this value as post jobs for split tables are not taken into account.
<b>jobNumRowstore</b>	Amount of <b>R3load</b> jobs set for the <b>Rowstore</b> group in case the <b>Columnstore</b> tables on the master host are loaded	By default this value is set to 100
<b>pause</b>	Sets <b>Migmonctrl</b> to <b>pause</b> mode where no changes are done to file <b>order_by.txt</b>	By default this value is set to <b>false</b> .

Option	Description	Comment
<code>customGroupLarge</code>	Separate groups for packages	Comma separated line
<code>customGroupMedium</code>	If you want to load a single package right from the start or with a defined number of jobs, you can add it to one of these groups.	<pre>customGroupLarge=REPOSRC ,SAPSDIC Order_by.txt [REPOSRC] jobNum=... REPOSRC-1 REPOSRC-... [SAPSDIC] jobNum... SAPSDIC</pre>
<code>customGroupSmall</code>		
<code>customGroupLargeJobNum</code>	Fixed number of <b>R3load</b> jobs for the groups	-
<code>customGroupMediumJobNum</code>		
<code>customGroupSmallJobNum</code>		
<code>jobDependencies</code>	Packages that need to be loaded after each other can be defined here. Packages defined here must be also defined as <b>customGroup</b>	<b>❖ Example</b> <pre>jobDependencies=REPOSRC ,SAPSDIC</pre> <b>SAPSDIC</b> is started after <b>REPOSRC</b> has finished.

### Mandatory Options for Dynamically Control of Import Monitor

Server mode (default): **username**, **password**, **host**, **instanceNumber**, **importDirs**, **order\_by**

#### i Note

The value of the **dbType** option is determined automatically in the shell script or batch files from the **dbms\_type** environment variable.

The migration monitor is started when the **dyn\_control\_import\_monitor.sh** script is executed with the **migmonctrl.jar** in the **classpath**. This means that **migmonctrl** runs as a single thread within the migration monitor. You do not have to start the migration monitor separately.

## 8.1.3 Assigning DDL Files to Packages

It is possible to use several different DDL\* .TPL templates during the export or import. The assignment of a specific DDL file to a single package is done within a simple text file, which then has to be specified using the **ddlMap** option within the properties file of the migration monitor. Packages not listed in the DDL mapping file use the default DDL control file.

## Example

### DDL Mapping File

```
# DDL mapping file ddl_mapping.txt
# !!! line with [GROUP_NAME] can be skipped
# used for documentation purposes only
[ SORTED UNLOAD ]
# DDL file for sorted unload
ddlFile = /export_dump/ABAP/DB/ORA/DDLORA.TPL
# package names
SAPAPPL0
SAPAPPL1
SAPSDIC
[ UNSORTED UNLOAD ]
  DDL file for unsorted unload
  ddlFile = ./DDLORA_LRG.TPL
# package names
SAPCLUST
SAPDDIM
SAPDFACT
```

## 8.1.4 Defining Groups of Packages

The “package group” feature is an enhancement to defining a package order. By defining groups, you can for example prevent certain packages being executed in parallel and you can define how many large tables are exported or imported at the same time. In addition, you can specify different values for the parameters `jobNum` and `taskArgs` or `loadArgs` for each package. Package groups can be defined in the same text file in which the package order can be defined (see parameter `orderBy`). The previous package order format is also fully supported.

A group starts with any arbitrary name in brackets and ends when the next group starts.

If package groups are defined, the maximum number of parallel `R3Load` jobs is the sum of `jobNum` of all packages. All packages without a package group will be assigned to a “default group” with the number of jobs that was defined in the properties file of the migration monitor.

### ⚠ Caution

Package groups defined with the `orderBy` parameter ignore the `SAPVIEW` and `SAP0000` packages.

## Example

### Package Order File with Group

```
# custom package order
# package names
SAPAPPL0
SAPAPPL1
SAPAPPL2
# package group
[ SEQUENTIAL GROUP ]
```



```
jobNum = 1
# table names
TABLE_A
TABLE_B
TABLE_C
```

## 8.1.5 Processing Split Tables

If tables have been split during the export, ensure before the import starts that the table exists (only once) and that the primary key and the indexes are created (only once) before or after (as defined in the DDL template) the table data has been imported. These tasks are automatically synchronized by the migration monitor.

### Context

WHR files are part of the package and have to be copied to the DATA export subdirectory to make sure that the same WHR file is used for the export and import of the corresponding package.

You can ensure this by using the [Defining Groups of Packages \[page 152\]](#) feature.

#### ❖ Example

**The target database does not support parallel data import. This example is valid for all database platforms:**

During the export you have split the table `MY_FIRST_TABLE` into 3 packages and `MY_SECOND_TABLE` into 5 packages. Now you want to run a maximum of 10 R3load processes for parallel data import.

Create the file `inputFile.txt` with the following content:

```
[ MY_FIRST_TABLE ]
jobNum = 1
MY_FIRST_TABLE-1
MY_FIRST_TABLE-2
MY_FIRST_TABLE-3
[ MY_SECOND_TABLE ]
jobNum = 1
MY_SECOND_TABLE-1
MY_SECOND_TABLE-2
MY_SECOND_TABLE-3
MY_SECOND_TABLE-4
MY_SECOND_TABLE-5
```

In this file, you can also define the processing order of packages or you can assign DDL files to packages.

The `inputFile.txt` file has to be specified as a value for the migration monitor parameter `orderBy`.

An R3load job is started for every group (`MY_FIRST_TABLE` and `MY_SECOND_TABLE`). The number of parallel R3load jobs is the total of the number of R3load jobs of each group plus the number of R3load jobs defined for the default group (which is made up of all packages without an explicit group name) defined by the parameter `jobNum`.

In this example, the parameter `jobNum` in the `import_monitor_cmd.properties` file has to be set to 8 to ensure that no more than 10 R3load processes run in parallel.

## Procedure

### Re-Starting the Import of a Split Table Package

If the import of a package fails, the rows that belong to this package have to be deleted using the `WHERE` condition assigned to this package before the data import is started again. The deletion with a `WHERE` clause can be very time-consuming. Therefore, it is faster to delete all rows of the corresponding table manually and re-import all packages instead.

Only if the number of failed packages is low and a lot of the packages for this table have completed successfully, it might be faster to perform the automatic restart which includes the execution of a `DELETE` with `WHERE` for each failed package.

**The following steps describe the procedure in detail:**

1. Identify the reason for the failure of the import of the packages.
2. Manually delete all rows of the table for which the import of one or more packages failed.
3. Remove the TSK files of all packages that import data into this table (`<table name>-<counter>__TPI.TSK`). Do not remove the TSK files that create either the table or the indexes for this table.
4. Adapt the file `import_state.properties` in the installation directory. Replace the status "+" of all packages for the corresponding table that had been imported successfully and has to be re-imported by "0".

For more information, see [Restarting R3load Processes \[page 100\]](#).

5. Restart the import.

## 8.1.6 Starting the Migration Monitor

The migration monitor has to be started on the **source database host** (export monitor) and on the **target database host** (import monitor).

You can start it using one of the following methods:

- The UNIX shell scripts `export_monitor.sh` / `import_monitor.sh`
- The Windows batch files `export_monitor.bat` / `import_monitor.bat`
- As part of the export / import procedure of the software provisioning manager 1.0

You can specify options in the command line or in the export or import property files, as described in [Configuration \[page 135\]](#). The names of the property files are `export_monitor_cmd.properties` and

`import_monitor_cmd.properties`. Templates for these files are included in the application archive and must be located in the current user's working directory.

Any options specified in the command line take precedence over the corresponding options in the application property file. Options are case-sensitive, that is, options that are not recognized are ignored.

## Prerequisites

- Make sure that the export dump directory and its subdirectory exist as described in the following table:

Directory	Description
<code>&lt;export_dump_dir&gt;/DATA</code>	Contains the STR files generated by R3ldctl
<code>&lt;export_dump_dir&gt;/DB</code>	Contains the DDL<DBTYPE> .TPL files generated by R3ldctl
<code>&lt;export_dump_dir&gt;/DB/ &lt;DBTYPE&gt;</code>	Contains the EXT files generated by R3szchk (optional)

- Make sure that the export dump directory can be accessed from the target host, either using a shared directory (local to the export host) or by using migration monitor's FTP feature.

## Procedure

1. Start the tool in one of the following ways:
  - Use the following commands depending on your operating system:
    - UNIX shell scripts  
`export_monitor.sh / import_monitor.sh`
    - Windows batch files  
`export_monitor.bat / import_monitor.bat`
    - IBM i-specific
      1. Set the environment variable **PASE\_THREAD\_ATTACH** to **"Y"** using:  
**ADDENVVAR PASE\_THREAD\_ATTACH 'Y'**
      2. Run the command:  
**CALL QP2TERM**
      3. `./export_monitor.sh / ./import_monitor.sh`
  - Automatically as part of the software provisioning manager export and import procedure
  - Manually within the software provisioning manager:
    1. On the *Parameter Mode Default Settings* screen of the software provisioning manager, choose *Custom*.
    2. On the *SAP System Export for Target System* screen, select *Start migration monitor Manually*.
    3. The software provisioning manager stops and asks you to start the migration monitor manually and to continue with the software provisioning manager as soon as the migration monitor has finished successfully.

## i Note

If you use FTP access and security is required, start the migration monitor in secure mode to prevent seeing the FTP password in the command line parameter string or in the property file (for example, on UNIX or IBM i: `./export_monitor_secure.sh -ftpPassword <password>`).

For more information about FTP, see *FTP Exchange Options* and *FTP Copy Options* in [Configuration \[page 135\]](#).

2. Close the shell window or command processor. The monitor process runs in the background.
3. Specify options as required in one of the following ways:
  - In the command line:  
Specify the option in the format: **-optionName optionValue**
  - In the application property file:  
Add an option as a new line in the format: **optionName=optionValue**

## ❖ Example

Command line for UNIX or IBM i:

```
./export_monitor.sh -ftp
./export_monitor.sh -ftpCopy
./export_monitor.sh -socket -host <import_server> -port 5000
```

## ❖ Example

Command line for Windows cmd.exe:

```
export_monitor.bat -net
export_monitor.bat -socket
```

4. Use `monitor*.log` and `*.console.log` files to check the monitor processing state.

## ❖ Example

**export\_monitor\_cmd.properties file with export options:**

```
# Export Monitor options

# Operating mode: ftp | net

#net

ftp

#

# Common options

#
```

```

# List of export directories, separator on Windows ; on UNIX, IBM i:

exportDirs=C:\TEMP\export_dump

# SAPinst start directory

installDir=C:\install\start

# Monitor timeout in seconds

monitorTimeout=30

#

# FTP options

#

# Remote FTP host

ftpHost=server

# Name of remote FTP user

ftpUser=sysadm

# Password of remote FTP user

ftpPassword=password

# List of remote FTP directories for export dump, separator : or ;

ftpExportDirs=/install_dir/export_dump

# Remote FTP exchange directory

ftpExchangeDir=/install_dir/exchange

# Number of parallel FTP jobs

ftpJobNum=3

#

```

## ❖ Example

**import\_monitor\_cmd.properties** file with import options:

```
# Import Monitor options

#

# Common options

#

# List of import directories, separator on Windows ; on UNIX, IBM i:

importDirs=/install_dir/export_dump

# SAPinst start directory

installDir=/install_dir/start

# Exchange directory

exchangeDir=/install_dir/exchange

# Generation of task files: yes | no

tskFiles=yes

# Inclusion of extent files: yes | no

extFiles=yes

# Monitor timeout in seconds

monitorTimeout=30

#

# R3load options

#

# DB code page for the target database
```

```

dbCodepage=1100

# Migration key

migrationKey=

# Additional R3load arguments for TASK phase

taskArgs=

# Additional R3load arguments for LOAD phase

loadArgs=

# Number of parallel import jobs

jobNum=3

#

# E-mail options

#

# SMTP server

mailServer=sap-ag.de

# "From" email address

mailFrom=mail@sap.com

# "To" email address

mailTo=mail@sap.com mail@yahoo.com

```

## 8.1.7 Using the “migmonCtrl” Add-On for the Export

The add-on can be activated by starting the migration monitor with the following scripts and programs:

- The UNIX shell scripts `dyn_control_export_monitor.sh`
- As part of the export procedure of the software provisioning manager

UNIX – example for the export\_monitor\_cmd.properties file using sort by size:

```
server dbType=ORA exportDirs=/hana/s2p_to_hana/exportDVD/ABAP installDir=.
orderBy=./order_by.txt ddlFile=DDLORA_LRG.TPL r3loadExe=/hana/s2p_to_hana/
sapKernel/oracle/linuxx86_64/R3load tskFiles=yes dataCodepage=4103 jobNum=5
monitorTimeout=10 loadArgs=-continue_on_error trace=all migmonCtrl
jobNumLarge=25 jobNumSmall=25 extFileDir=/hana/s2p_to_hana/exportDVD/ABAP/DATA
```

UNIX – example for the export\_monitor\_cmd.properties file using sort by time:

```
server dbType=ORAexportDirs=/sapdb/exportDvD_741/ABAP installDir=/home/
emroot/export_plx110 orderBy=/home/emroot/export_plx110/order_by.txt
ddlFile=DDLORA_LRG.TPL r3loadExe=/usr/sap/Q01/D01/exe/R3load tskFiles=yes
dataCodepage=4103 jobNum=5 monitorTimeout=10 loadArgs=-continue_on_error
trace=all migmonCtrl jobNumLarge=10 jobNumSmall=10 minRuntime=0 exportTimeFile=./
export_time.txt importTop=5 importTimeFile=./import_time.txt
```

## ❖ Example

Example for a command line call to create package filter files:

```
./dyn_control_export_monitor.sh -createPackageFilter -outputFile
package_list_%hostName%.txt -hostNames plx101,plx110
```

UNIX – example for a export\_monitor\_cmd.properties file when using a package filter:

```
server
dbType=ORA
exportDirs=/sapdb/exportDvD_741/ABAP
installDir=/home/emroot/export_plx110
orderBy=/home/emroot/export_plx110/order_by.txt
ddlFile=DDLORA_LRG.TPL
r3loadExe=/usr/sap/Q01/D01/exe/R3load
tskFiles=yes
dataCodepage=4103
jobNum=5
monitorTimeout=10
loadArgs=-continue_on_error
trace=all
decluster=true
migmonCtrl
jobNumLarge=10
jobNumSmall=10
extFileDir=/sapdb/exportDvD_741/ABAP/DATA
packageFilter=/sapdb/exportDvD_741/ABAP/DB/HDB/package_filter_plx110.txt
onlyProcessOrderBy=true
```

UNIX – example for an export\_monitor\_cmd.properties file when using a package filter and parallel export/import:

```
server
dbType=ORA
exportDirs=/sapdb/exportDvD_741/ABAP
installDir=/home/emroot/export_plx110
orderBy=/home/emroot/export_plx110/order_by.txt
ddlFile=DDLORA_LRG.TPL
r3loadExe=/usr/sap/Q01/D01/exe/R3load
tskFiles=yes
dataCodepage=4103
jobNum=0
monitorTimeout=10
loadArgs=-continue_on_error
net
```



```

netExchangeDir=/sapdb/exportDvD_741/SGN
trace=all
decluster=true
migmonCtrl
jobNumLarge=10
jobNumSmall=10
extFileDir=/sapdb/exportDvD_741/ABAP/DATA
packageFilter=/sapdb/exportDvD_741/ABAP/DB/HDB/package_filter_plx110.txt
onlyProcessOrderBy=true
netStatisticsFile=package_filter_plx110.statistics

```

## 8.1.8 Using the migmonCtrl Add-On of the Import Migration Monitor

### i Note

You can use the migmonCtrl add-on only when you have SAP HANA database as the target database. Make sure that the `import_monitor_cmd.properties` file has the following entry: `dbType=HDB`.

You can start the tool as follows:

- The UNIX shell scripts `dyn_control_import_monitor.sh`
- As part of the export / import procedure in the software provisioning manager

The application allows you to specify options in the command line. Options are case-sensitive; any options that are not recognized are ignored. To specify an option, enter the following in the command line: **-optionName optionValue**

### ❖ Example

Example of a command line for a UNIX terminal:

```

./dyn_control_import_monitor.sh -username myname -password mypass -host myhost
-instanceNumber 02 -

```

The application allows you to specify additional options in the application property file. The name of the property file is `migmonctrl_cmd.properties`. Templates for these files are included in the application archive and must be located in the working directory of the current user.

Example of a `migmonctrl_cmd.properties` file:

```

maximumJobNum=70
smallJobWeight=6
memoryFactor=2
minimumLargeJobNum=5
minimumSmallJobNum=5
initialLargeJobNum=15
initialSmallJobNum=15
coreMultiplier=4
pause=false
jobNumRowstore=100
loadRowstoreSeparate=true
skipIsRelevantPackageCheck=false
#####
# Default entries

```

```

# Comma separated string. Jobs from this definition are started one by
one. Jobs must be also defined as Custom Group.
#jobDependencies=
# Number of R3load jobs for custom group[s] of type Small.
#customGroupSmallJobNum=0
# Number of R3load jobs for custom group[s] of type Medium.
#customGroupMediumJobNum=0
# Number of R3load jobs for custom group[s] of type Large.
#customGroupLargeJobNum=0
# Comma separated list which defines a group for each listed package.
#customGroupSmall=
# Comma separated list which defines a group for each listed package.
#customGroupMedium=
# Comma separated list which defines a group for each listed package.
#customGroupLarge=

```

## 8.1.9 Output Files

### Export

- export\_monitor.log
- export\_state.properties
- ExportMonitor.console.log

### Import

- import\_monitor.log
- import\_state.properties
- ImportMonitor.console.log

### migmonCtrl add-on

- migmonctrl.log
- MigmonJobber.console.log

Both the export and import state files contain package state lines such as `SAPUSER=+`.

The format of state lines is `<PACKAGE>=<STATE>`. Possible values for state are listed in the following table:

Value	Description
0	Package export/import not yet started
?	Package export/import in progress
-	Package export/import finished with errors
+	Package export/import finished successfully

If any ftp or net exchange options are used, then the export state file might contain a second `<STATE>` column that refers to the state of the package transfer.

Then the export state file contains package state lines such as `SAPUSER=++`.

The format of state lines is `<PACKAGE>=<STATE>`. Possible values for state are listed in the following table:

Value	Description
0	Package export not yet started
?	Package export in progress
-	Package export finished with errors
+0	Package export finished successfully; package transfer not yet started
+?	Package transfer in progress
+-	Package transfer finished with errors
++	Package transfer finished successfully

## 8.2 Analysis of the Export and Import Times

You can reduce the runtimes by splitting the packages in question or extracting long-running tables from the packages.

You can use the `MIGTIME.SAR` archive to analyze the runtimes of the individual packages. It is contained in the `<OS>/COMMON/INSTALL` directory of the `SWPM10SP<Support_Package_Number>_<Version_Number>.SAR` archive. It is unpacked to the installation directory using `SAPCAR` and contains documentation in addition to the tools.

## 8.3 Table Comparison with Software Update Manager

This section describes how to compare table contents using the Software Update Manager 1.0 (SUM) tool during a system copy project.

We call this functionality “Table Comparison with SUM”. The tool only needs access to the database, so you can run it regardless of whether the ABAP system is running or not. The “Table Comparison with SUM” functionality is available as of Software Update Manager (SUM) 1.0 SP11.

### Related Information

[Modes of the Table Comparison Tool \[page 164\]](#)

[Restrictions \[page 164\]](#)

[Using the Table Comparison Tool \[page 165\]](#)

## 8.3.1 Restrictions

This section describes the cases when you cannot use Table Comparison with SUM.

You can only use Table Comparison with SUM:

- If both the source system and the target system use the same endian type. For details on the endian type of an SAP system, see SAP Note [552464](#).
- If there has been no Unicode Conversion, that is no change from Non-Unicode to Unicode.

## Related Information

[Table Comparison with Software Update Manager \[page 163\]](#)

## 8.3.2 Modes of the Table Comparison Tool

You can run the table comparison tool either in “single” or “twin” mode.

The tool has the following modes of operation:

- In “single” mode, the tool only accesses the SAP database of the current system it is running on. This is supported for all database types supported by SAP. In this mode, the tool generates checksums for the selected user or for all SAP tables. The tool reports the directory containing the checksums at the end. This directory must then be transferred to the target host. There the tool must be run again in “single” mode and must have `read/write` access to the previously generated checksum directory. It uses them as a reference and generates the corresponding checksums for the target database. Any discrepancy found is reported. checksums are only generated for ranges of rows, so the granularity of reported checksum differences is rather “coarse”.  
“Single” mode means that you run the Table Comparison Tool with SUM separately and twice:  
Single mode corresponds to the SUM options [Generate Export Checksums](#) (to be executed on the source system) and [Generate Import Checksums](#) (to be executed on the target system).
  1. You execute SUM option [Generate Export Checksums](#) on the **source system** to create the checksums.
  2. You execute SUM option [Generate Import Checksums](#) on the **target system** to verify the checksums by comparing them with the content of the tables in the target database.
- “Twin” mode is by default **unavailable** in a regular system copy because you cannot connect simultaneously from one application server to both the source and the target database system. Therefore we recommend using “single” mode.







## Related Information

[Table Comparison with Software Update Manager \[page 163\]](#)

## 8.3.3 Using the Table Comparison Tool

This section describes how to use the Table Comparison Tool.

### Prerequisites

- Make sure that you run Table Comparison **before** the primary application server instance on the target system is started for the first time. Otherwise the comparison might return wrong results because table content was already updated when the instance was started.
- The database of the system for which you want to use the tool is up and running.  
Make sure that **R3trans -x** works.
- You have downloaded the Table Comparison tool as described in SAP Note *Central Note - Software Update Manager <1.0 | 2.0> SP<Latest\_Number>* at <https://support.sap.com/sltoolset>   [System Maintenance](#)  [System Maintenance Scenarios](#)  [Software Update/Upgrade using SUM](#) .
- We strongly recommend that you do not perform productive operations while you apply table comparison with the Software Update Manager (SUM): Since the tool generates checksums, changing table contents might lead to incorrect results if you apply the tool while the system is running.
- Make sure that you have installed the latest version of the SAP Host Agent. For more information, see **SAP Note 1031096**  and the [SAP Library \[page 22\]](#) for your release at:

#### i Note

Navigate to the SAP Help Portal page for the SAP NetWeaver release your SAP product is based on as described in section [Accessing the SAP Library \[page 22\]](#), and then continue the navigation as described below.

 [Function-Oriented View](#)  [Solution Life Cycle Management by Key Capability](#)  [SAP Host Agent](#) .

- Make sure that you have configured SUM so that it works together with the SAP Host Agent:
  1. Log on as user `root` and call the `SUMSTART` script as follows:  
**<SUM\_Directory>/abap/SUMSTART confighostagent**  
If you are working with symbolic links for the `SUM` directory, you need to call the `SUMSTART` script with the logical path information.
  2. Restart the SAP Host Agent using the following command:  
**<HOSTAGENT\_Directory>/exe/saphostexec -restart**

### Procedure

1. Log on as user `<sapsid>adm`.
2. Unpack the SUM archive by executing the following commands:

```
mkdir <SUM_Directory>
```

```
cd <SUM_Directory>
```

```
SAPCAR -xvf SUM.SAR
```

### ❖ Example

```
mkdir /usr/sap/put  
cd /usr/sap/put  
SAPCAR -xvf SUM.SAR
```

3. Proceed as follows to start SUM using the SAP Host Agent:

- a. Open a browser window and enter the following URL in the address bar:

If you use SUM 2.0 SP06 or higher, enter: <https://<hostname>:1129/lms1/sumabap/<SAPSID>/doc/slui>

If you use SUM 1.0 or SUM 2.0 lower than SP06, enter: <https://<hostname>:1129/lms1/migtool/<SAPSID>/doc/sluigui>

### i Note

- 1129 is the https port of the SAP Host Agent.
- Use http instead of https if SSL is not configured. In this case, the URL you have to enter looks as follows:  
If you use SUM 2.0 SP06 or higher: <http://<hostname>:1128/lms1/sumabap/<SAPSID>/doc/slui>  
If you use SUM 1.0 or SUM 2.0 lower than SP06: <http://<hostname>:1128/lms1/migtool/<SAPSID>/doc/sluigui>

- b. A dialog box appears in which you enter as user name the `<sapsid>adm` and the password.

After logon, the SAP Host Agent starts SUM by calling the `SAPup` executable in the background.

From a technical point of view, the `SAPup` executable is started twice, as can be seen from the process list:

- One entry with `gt=httpchannel` represents `SAPup` handling the requests coming from SAP Host Agent.
- The second `SAPup` with parameter `guiconnect` is triggering tools such as `R3trans`, `tp`, or `R3load`.

SUM starts with the `SAPUI5`-based user interface.

The initial screen is displayed.

4. On the initial screen, you can choose between the following options, which both work in “single” mode:

- Generating export checksums  
This is the option for checking tables in the source system.
- Generating import checksums  
This is the option for checking tables in the target system.

You cannot use the option for direct table content check for system copy purposes

5. You can specify the tables for which you want to compare content on the source and target system:

- Compare all tables  
When you decide to perform a full comparison, it is strongly recommended to exclude some tables where the content is changed during a regular system copy. Otherwise the verification for these tables fails. Create a file in the directory `<SUM_DIR>/abap/bin` before you run the export.

Name this file EUCLONEDEFS\_ADD.LST and enter the following content :

**DDNTT nocontent igncrcdiffs**

**REPOLOAD nocontent igncrcdiffs**

The list of tables to be ignored in the comparison check can be modified according to individual requirements, for example, if it is clear that the table has been changed on the target system and the difference is expected.

It is also possible to run the check on the target system without the modification. If an error is raised on the two tables mentioned above, you can ignore the comparison check differences and continue SUM in the dialog.

- Provide a list of tables

If you only want to check a selected number of tables, provide an input file like this:

```
$ cat /tmp/CRCTableList.lst # Tables to be checked TAORA IAORA
```

Enter the full path to this file in the input field provided.

6. If no error occurs, you are informed that the tool has generated the checksum in the specified directory.
  - a. You can now move the directory to a host that has access to your target database.
  - b. Rerun the tool on the target system with option [Generate Target Checksums](#). Before you rerun the tool, make sure that the primary application server instance is stopped.

This time you have to provide the path to this directory in the [Table List](#) field.

7. Verify the result of the table comparison. If the differences in the table contents of the source and target system are inconsistent, and you cannot explain the differences - for example, due to changes in the target system during the table comparison check on the source system - open an incident on component BC-INS-MIG.

## Related Information

[Table Comparison with Software Update Manager \[page 163\]](#)

## 8.4 Using the Package Splitter

Here you find information what you can do with the Package Splitter tool.

You can use the Package Splitter tool for splitting the following:

- STR/EXT files
- STR files
- WHR files

The tool is located in the SPLIT.SAR archive in the /<OS>/COMMON/INSTALL folder in the directory structure of software provisioning manager 1.0.

Content of the archive file:

- split.jar

- `str_splitter.sh / str_splitter.bat`
- `where_splitter.sh / where_splitter.bat`

## Related Information

[Configuration \[page 168\]](#)

[Starting the Package Splitter \[page 171\]](#)

[Executing the STR Splitter and the WHERE Splitter \[page 173\]](#)

[Output Files \[page 172\]](#)

## 8.4.1 Configuration

Here you find information about command line options of the Package Splitter tool.

### Help

The tool displays the available parameters, if you call it with one of the following command line options:

- `-help`
- `-?`

### Version

The tool will display the version information (release branch and build date), if you call it with the following command line option:

`-version`

## STR Splitter Options

Option	Description	Comment
<code>strDirs</code>	List of STR file directories	Separator on Windows: <code>;</code> Separator on UNIX: <code>:</code>



Option	Description	Comment
extDirs	List of EXT file directories	Separator on Windows: ; Separator on UNIX: :
outputDir	Output directory	If missing, then the directories that contain the corresponding STR/EXT files are used.
top	Maximum number of tables	Largest N tables are extracted from the packages.
tableLimit	Table size limit in MB	All tables larger than tableLimit are extracted from packages.
packageLimit	Package size limit in MB	All packages larger than packageLimit are split into packages smaller than this limit.
tableFile	File with the table names that are to be extracted	All tables from the file are extracted from the packages. This file must contain the table names on separate lines (one name on each line).
maxNumberOfTables	<ul style="list-style-type: none"> <li>Integer value</li> <li>Maximum number of tables in the package</li> </ul>	Split the packages as keep the maximum number of tables in package.

❖ Example

```
maxNumberOfTables=500
```

This parameter is with higher priority

## WHERE Splitter Options

Option	Description	Comment
whereDir	WHERE file directory	Directory with WHR files.
strDirs	List of STR file directories	Separator on Windows: ; Separator on UNIX: :
outputDir	Output directory	If missing, then the directory that contains the corresponding WHR files is used.

Option	Description	Comment
<code>whereLimit</code>	Maximum number of WHERE clauses	All WHR files that have more than <code>whereLimit</code> WHERE clauses are split into WHR files with <code>whereLimit</code> WHERE clauses.
<code>whereFiles</code>	Whitespace separated list of WHR files	Names of WHR files to be split. WHR files should exist in WHERE file directory.

## Trace Option

Option	Description	Comment
<code>trace</code>	Trace level	Possible values:  <b>all</b> , <b>off</b> , <b>1</b> (error), <b>2</b> (warning), <b>3</b> (info), <b>4</b> (config, default), <b>5</b> , <b>6</b> , <b>7</b> (trace)

## Mandatory Options

- Splitting STR and EXT files:  
`strDirs`, `extDirs`, `top` and/or `tableLimit` and/or `packageLimit` and/or `tableFile`
- Splitting STR files:  
`strDirs`, `tableFile`
- Splitting WHR files:  
`whereDir`, `whereLimit`

## Related Information

[Using the Package Splitter \[page 167\]](#)

## 8.4.2 Starting the Package Splitter

Here you find information about how to start the Package Splitter tool.

You can start the Package Splitter tool using one of the following:

- UNIX shell script `str_splitter.sh` / `where_splitter.sh`
- As part of the export procedure (STR Splitter) in the software provisioning manager

The application allows you to specify options in the command line and/or in the application property file. The name of the property file is `package_splitter_cmd.properties`.

Any options specified in the command line take precedence over the corresponding options in the application property file. Options are case-sensitive; any options that are not recognized are ignored. To specify an option:

- in the command line, enter `-optionName optionValue`
- in the application property file, insert the new line `optionName=optionValue`

### STR Splitter

Example of a command line for a UNIX terminal:

#### ❖ Example

```
./str_splitter.sh -strDirs /export_dump/DATA -extDirs /export_dump/DB/ORA  
-outputDir /split_output -top 20 -tableLimit 50 -packageLimit 200 -trace all
```

### WHERE Splitter

You can start the tool using the UNIX shell script `where_splitter.sh`.

#### ❖ Example

Example of a command line for a UNIX terminal:

```
./where_splitter.sh -whereDir /r3a_dir -strDirs /export_dump/DATA -outputDir /  
split_output -whereLimit 5 -trace all
```

### Related Information

[Using the Package Splitter \[page 167\]](#)

## 8.4.3 Output Files

Here you find information about the output files of the Package Splitter tool.

### STR Splitter

- Newly split STR/EXT files
- Original backup of STR/EXT files (\*.STR.old/\*.EXT.old)
- SAPSTR.LST file
- str\_splitter.log
- PackageSplitter.console.log

### WHERE Splitter

- Newly split WHR files
- Original backup of WHR files (\*.WHR.old)
- SAPSTR.LST file
- where\_splitter.log
- PackageSplitter.console.log

### STR Splitter Notes

SAP0000 and SAPVIEW packages are never modified by the splitter. SAPNTAB package is always created and contains 5 predefined tables:

SVERS, DDNTF, DDNTF\_CONV\_UC, DDNTT, DDNTT\_CONV\_UC

### Integration

Before you start to split files, we strongly recommend that you back up your original STR/EXT or WHR files in separate backup directories. These backup files can be used later to try other splitting options. If the output directory is specified, then the newly split files are generated in this directory; otherwise they are generated in the directories where the corresponding original files are located.

The original backup files (backup name is `<file_name>.old`) are always located in the same directories where the corresponding original files are located.

## Related Information

[Using the Package Splitter \[page 167\]](#)

### 8.4.4 Executing the STR Splitter and the WHERE Splitter

Proceed as described in this section to execute the STR Splitter / WHERE Splitter.

#### Procedure


1. Prepare the properties file `package_splitter_cmd.properties` (optional).
2. Start the Package Splitter tool using the shell script or batch file.
3. Analyze the screen output and log file.

## Related Information

[Using the Package Splitter \[page 167\]](#)

## 8.5 Troubleshooting for Migration to SAP HANA

### General Information

See the blog *Migration to SAP HANA: Analyzing Problems within Software Provisioning Manager* to get hints how to identify the root cause of issues during the classical migration procedure: <http://scn.sap.com/community/it-management/alm/software-logistics/blog/2013/10/04/migration-to-sap-hana-analyzing-problems-within-software-provisioning-manager> 

#### Caution

Only increase the trace level if this is requested by support for troubleshooting purposes. Increasing the trace level has negative impact on the performance of the system and of the SAP HANA database.

## Increasing the Trace Level of R3\* Tool

If R3load or any other R3\* tool stops, it may be useful to increase trace level and repeat the failing step. For this, set the following environment variables and rerun the tool:

- R3load: `R3LOAD_TL = 3`
- R3ldctl: `R3LDCTL_TL = 3`
- R3szchck: `R3SZCHK_TL = 3`

## Increasing the Trace Level of SAP HANA




Consider to increase the trace level for the SAP HANA SQLDBC client by using the following commands:

Action	Command
Enable trace*	<code>./hdbclient/hdbsqldbc_cons trace sql on</code>
Refresh trace*	<code>./hdbclient/hdbsqldbc_cons trace refresh</code>
Disable trace	<code>./hdbclient/hdbsqldbc_cons trace sql off</code>
Locate trace	<code>./hdbclient/hdbsqldbc_cons show config</code>


\* ) While “enable trace” enables the tracing only for newly started processes, “refresh trace” enables the tracing also for already running processes.

## Checking Troubleshooting Information in SAP Notes

In addition to the SAP Notes for the migration procedure listed in the previous sections, here is a selection of further SAP Notes containing information for specific issues:

- **SAP Note 1722395**  (*SAP HANA: Known problems*) lists known issues that may occur during a migration to SAP HANA.
- **SAP Note 1860493**  (*Out of memory during import migration to HANA*) in case you are facing an out-of-memory error during the migration to SAP HANA.
- **SAP Note 1641210**  (*SAP HANA database: Checking for suspected problems*) provides a checklist how to investigate a potential problem in the SAP HANA database.

## Open an Incident

See **SAP Note 752505**  (*SAP System Provisioning / Installation Problems*). It describes the log files and which information is required in an SAP incident message so that it can be efficiently processed. With this

information, create an SAP incident with a direct connection to the customer system under the following component:

- In case of migration tool issues: BC-INS-MIG-TLA
- In case of general migration procedure issues: BC-INS-MIG
- In case of database-related issues: BC-DB-HDB-INS


## 8.6 Starting and Stopping SAP System Instances Using the SAP Management Console

You can start and stop all instances of your SAP system using the SAP Management Console (SAP MC) except the database instance.

### Prerequisites


- Make sure that the host names defined in the DNS server match the names of the SAP system instance hosts. In particular, keep in mind that host names are case-sensitive. For example, if the names of the SAP system instance hosts are in upper case, but the same host names are defined in the DNS server in lower case, starting and stopping the system does not work.
- If you want to start or restart remote systems or instances, make sure that you have registered them in the SAP Management Console (SAP MC). You do not need to register SAP systems or instances installed on the local host, because the SAP MC displays them automatically.
- The SAP Host Agent is installed on the host where the application server of the SAP system or instance runs.
- You have installed Java Runtime Environment (JRE) 5.0 or higher.
- Your Web browser supports Java.
- Your Web browser's Java plug-in is installed and enabled to run scripting of Java applets.

#### **i** Note

If your Web browser no longer supports Java applet technology, you can configure the SAP MC to run locally on your PC. For more information, see section *Configuring SAP MC locally* in SAP Note [1014480](#) .

### Context

#### → Recommendation

If you experience any issues when starting or using the SAP MC, refer to SAP Note [1153713](#) .

- For more information about handling the SAP MC, see the SAP Library at:

SAP Release and SAP Library Quick Link	SAP Library Path (Continued)
<ul style="list-style-type: none"> <li>• SAP NetWeaver 7.3 including Enhancement Package 1 <a href="http://help.sap.com/nw731">http://help.sap.com/nw731</a></li> <li>• SAP NetWeaver 7.4 <a href="http://help.sap.com/nw74">http://help.sap.com/nw74</a></li> <li>• SAP NetWeaver 7.5 <a href="http://help.sap.com/nw75">http://help.sap.com/nw75</a></li> <li>• SAP NetWeaver Application Server for ABAP 7.51 innovation package <a href="https://help.sap.com/nw751abap">https://help.sap.com/nw751abap</a></li> <li>• SAP NetWeaver AS for ABAP 7.52 <a href="https://help.sap.com/nw752abap">https://help.sap.com/nw752abap</a></li> </ul>	► <i>Application Help</i> ► <i>Function-Oriented View</i> ► <i>Solution</i> <i>Life Cycle Management</i> ► <i>SAP Management Console</i> ►

- If your newly installed SAP system is part of a heterogeneous SAP system landscape comprising systems or instances on Windows platforms, you can also start and stop it from a Windows system or instance using the **SAP Microsoft Management Console (SAP MMC)**.  
For more information about handling the SAP MMC, see the SAP Library at:

Release SAP Library Quick Link	SAP Library Path (Continued)
<ul style="list-style-type: none"> <li>• SAP NetWeaver 7.3 including Enhancement Package 1 <a href="http://help.sap.com/nw731">http://help.sap.com/nw731</a></li> <li>• SAP NetWeaver 7.4 <a href="http://help.sap.com/nw74">http://help.sap.com/nw74</a></li> <li>• SAP NetWeaver 7.5 <a href="http://help.sap.com/nw75">http://help.sap.com/nw75</a></li> <li>• SAP NetWeaver Application Server for ABAP 7.51 innovation package <a href="https://help.sap.com/nw751abap">https://help.sap.com/nw751abap</a></li> <li>• SAP NetWeaver AS for ABAP 7.52 <a href="https://help.sap.com/nw752abap">https://help.sap.com/nw752abap</a></li> </ul>	► <i>Application Help</i> ► <i>Function-Oriented View</i> ► <i>Solution</i> <i>Life Cycle Management</i> ► <i>SAP Microsoft Management</i> <i>Console: Windows</i> ►

Only valid for 'Platform': Linux

## i Note

**Linux only:** If your server runs on a Linux distribution using systemd version 234 or later, it's technically possible that you use systemd commands on operating system level to start and stop SAP systems. However, we recommend that you **do not** use these systemd commands. For example, using systemd to restart or stop the systemd unit will not only stop the start service, but the entire related SAP instance with time limits for the processes to shut down. This might end in unexpected results. To start and stop SAP instances, we recommend that you use the SAP Management Console, as outlined here, or the



sapcontrol commands (see also [Starting and Stopping SAP System Instances Using Commands \[page 179\]](#)). For more information about systemd, see SAP Note [3139184](#).

End of 'Platform': Linux

## Procedure

- **Starting the Web-Based SAP Management Console**

1. Start a Web browser and enter the following URL:

**`http://<Host_Name>:5<Instance_Number>13`**

### ❖ Example

If the instance number is 53 and the host name is `saphost06`, you enter the following URL:

**`http://saphost06:55313`**

This starts the SAP MC Java applet.

### i Note

If your browser displays a security warning message, choose the option that indicates that you trust the applet.

2. Choose [Start](#).

The SAP Management Console (SAP MC) appears.

By default, the instances installed on the host you have connected to are already added in the SAP MC.

### i Note

If the instances have not been added or if you want to change the configuration to display systems and instances on other hosts, you have to register your system manually. This is described in *Registering Systems and Instances in the SAP Management Console* below.

- **Starting SAP Systems or Instances**

Similarly, you can start or restart all SAP systems and individual instances registered in the SAP MC.

1. In the navigation pane, open the tree structure and navigate to the system node that you want to start.
2. Select the system or instance and choose [Start](#) from the context menu.
3. In the [Start SAP System\(s\)](#) dialog box, choose the required options.
4. Choose [OK](#).

The SAP MC starts the specified system or system instances.

### i Note

The system might prompt you for the SAP system administrator credentials. To complete the operation, you require administration permissions.

Log in as user `<sapsid>adm`.

## Starting SAP System Instances Successively

If you need to start the instances of an SAP system successively – for example when you want to start a distributed or a high-availability system – proceed as follows:

1. Start the database instance.
2. Start the ABAP central services instance ASCS<Instance\_Number>.
3. Start the primary application server instance D[VEBMGS] <Instance\_Number>.

#### **i Note**

In SAP systems based on SAP NetWeaver 7.5 or higher, the primary application server instance is named D<Instance\_Number>.

In SAP systems based on SAP NetWeaver 7.4 or lower, the primary application server instance is named DVEBMGS<Instance\_Number>.

4. Start additional application server instances D<Instance\_Number>, if there are any.

#### • **Stopping SAP Systems or Instances**

Similarly, you can stop all SAP systems and individual instances registered in the SAP MC.

1. Select the system or instance you want to stop and choose **Stop** from the context menu.
2. In the **Stop SAP System(s)** dialog box, choose the required options.
3. Choose **OK**.

The SAP MC stops the specified system or system instances.

#### **i Note**

The system might prompt you for the SAP system administrator credentials. To complete the operation, you require administration permissions.

Log in as user <sapsid>adm.

#### **Stopping SAP System Instances Successively**

If you need to stop the instances of an SAP system successively – for example when you want to start a distributed or a high-availability system – proceed as follows:

1. Stop additional application server instances D<Instance\_Number>, if there are any.
2. Stop the primary application server instance D[VEBMGS] <Instance\_Number> .

#### **i Note**

In SAP systems based on SAP NetWeaver 7.5 or higher, the primary application server instance is named D<Instance\_Number>.

In SAP systems based on SAP NetWeaver 7.4 or lower, the primary application server instance is named DVEBMGS<Instance\_Number>.

3. Stop the ABAP central services instance ASCS<Instance\_Number>.
4. Stop the database instance.

## 8.7 Starting and Stopping SAP System Instances Using Commands

### Prerequisites

You are logged on to the SAP system host as user `<sapsid>adm`.

### Context

#### Note

The `startsap` and `stopsap` commands are deprecated. SAP recommends that you do not use them any longer. For more information, see SAP Notes [1763593](#) and [809477](#).

Only valid for 'Platform': Linux

**Linux only:** If your server runs on a Linux distribution using systemd version 234 or later, it's technically possible that you use systemd commands on operating system level to start and stop SAP systems. However, we recommend that you **do not** use these systemd commands. For example, using systemd to restart or stop the systemd unit will not only stop the start service, but the entire related SAP instance with time limits for the processes to shut down. This might end in unexpected results. To start and stop SAP instances, we recommend that you use the `sapcontrol` commands or the SAP Management Console (see also [Starting and Stopping SAP System Instances Using the SAP Management Console \[page 175\]](#)). For more information about systemd, see SAP Note [3139184](#).

End of 'Platform': Linux

This section only lists the basic commands how to start or stop an SAP system. You can find a detailed list of all `SAPControl` options and features in the command line help, which you can call as follows:

```
/usr/sap/<SAPSID>/<INSTANCE><NUMBER>/exe/sapcontrol --help
```

#### ❁ Example

```
/usr/sap/GB1/D00/exe/sapcontrol --help
```

### Procedure

- Starting an SAP System or Instance

- Starting an SAP System:

You can start an SAP system by executing the following commands from the command line (`<Instance_Number>` can be the number of any instance of the SAP system):

```
/usr/sap/<SAPSID>/<INSTANCE><NUMBER>/exe/sapcontrol -nr <instance_number>  
-function StartSystem
```

#### ❖ Example

```
/usr/sap/GB1/D00/exe/sapcontrol -nr 01 -function StartSystem
```

- Starting an SAP System Instance

You can start an SAP system instance by executing the following commands from the command line:

```
/usr/sap/<SAPSID>/<INSTANCE><NUMBER>/exe/sapcontrol -nr <instance_number>  
-function Start
```

#### ❖ Example

Starting an instance with <instance\_number> 02: `/usr/sap/GB1/D00/exe/sapcontrol -nr 02 -function Start`

For remote instances, the syntax is slightly different, because you also have to apply the **-host** and **-user** parameters:

```
/usr/sap/<SAPSID>/<INSTANCE><NUMBER>/exe/sapcontrol -nr <instance_number>  
-host <remote host> -user <sapsid>adm <password> -function Start
```

#### ❖ Example

Starting a remote instance with <instance\_number> 02: `/usr/sap/GB1/D00/exe/sapcontrol -nr 02 -host myremotehost -user gbladm -function Start`

- Stopping an SAP System or Instance

- Stopping an SAP System

You can stop an SAP system by executing the following commands from the command line (**<Instance Number>** can be the number of any instance of the SAP system):

```
/usr/sap/<SAPSID>/<INSTANCE><NUMBER>/exe/sapcontrol -nr <instance_number>  
-function StopSystem
```

#### ❖ Example

```
/usr/sap/GB1/D00/exe/sapcontrol -nr 01 -function StopSystem
```

- Stopping an SAP System Instance

You can stop an SAP system instance by executing the following commands from the command line:

```
/usr/sap/<SAPSID>/<INSTANCE><NUMBER>/exe/sapcontrol -nr <instance_number>  
-function Stop
```

#### ❖ Example

Stopping an instance with <instance\_number> 02: `/usr/sap/GB1/D00/exe/sapcontrol -nr 02 -function Stop`

For remote instances, the syntax is slightly different, because you also have to apply the **-host** and **-user** parameters:

```
/usr/sap/<SAPSID>/<INSTANCE><NUMBER>/exe/sapcontrol -nr <instance_number>  
-host <remote host> -user <sapsid>adm <password> -function Stop
```

#### ❖ Example

Stopping a remote instance with `<instance_number> 02`: `/usr/sap/GB1/D00/exe/sapcontrol -nr 02 -host myremotehost -user gbladm -function Stop`

#### i Note

The database is not stopped by these commands. You have to stop the database using database-specific tools or commands.

- **Checking System Instance and Processes**

- With the following command you get a list of system instances, their status, and the ports used by them (`<Instance_Number>` can be the number of any instance of the SAP system):

```
/usr/sap/<SAPSID>/<INSTANCE><NUMBER>/exe/sapcontrol -nr <instance_number>  
-host <remote host> -user <sapsid>adm <password> -function  
GetSystemInstanceList
```

#### ❖ Example

```
/usr/sap/GB1/D00/exe/sapcontrol -nr 02 -host myremotehost -user gbladm  
-function GetSystemInstanceList
```

- With the following command you get a list of instance processes and their status:  
`/usr/sap/<SAPSID>/<INSTANCE><NUMBER>/exe/sapcontrol -nr <instance_number>`  
`-host <remote host> -user <sapsid>adm <password> -function GetProcessList`

#### ❖ Example

```
/usr/sap/GB1/D00/exe/sapcontrol -nr 02 -host myremotehost -user gbladm  
-function GetProcessList
```

- **Troubleshooting**



If you get an error like "FAIL: NIECONN\_REFUSED", execute `sapcontrol -nr <Instance_Number> -function StartService <SAPSID>` to ensure that `sapstartsrv` is running. Then execute again the start or stop command.

# Important Disclaimers and Legal Information

## Hyperlinks

Some links are classified by an icon and/or a mouseover text. These links provide additional information.

About the icons:

- Links with the icon  : You are entering a Web site that is not hosted by SAP. By using such links, you agree (unless expressly stated otherwise in your agreements with SAP) to this:
  - The content of the linked-to site is not SAP documentation. You may not infer any product claims against SAP based on this information.
  - SAP does not agree or disagree with the content on the linked-to site, nor does SAP warrant the availability and correctness. SAP shall not be liable for any damages caused by the use of such content unless damages have been caused by SAP's gross negligence or willful misconduct.
- Links with the icon  : You are leaving the documentation for that particular SAP product or service and are entering an SAP-hosted Web site. By using such links, you agree that (unless expressly stated otherwise in your agreements with SAP) you may not infer any product claims against SAP based on this information.

## Videos Hosted on External Platforms

Some videos may point to third-party video hosting platforms. SAP cannot guarantee the future availability of videos stored on these platforms. Furthermore, any advertisements or other content hosted on these platforms (for example, suggested videos or by navigating to other videos hosted on the same site), are not within the control or responsibility of SAP.

## Beta and Other Experimental Features

Experimental features are not part of the officially delivered scope that SAP guarantees for future releases. This means that experimental features may be changed by SAP at any time for any reason without notice. Experimental features are not for productive use. You may not demonstrate, test, examine, evaluate or otherwise use the experimental features in a live operating environment or with data that has not been sufficiently backed up.

The purpose of experimental features is to get feedback early on, allowing customers and partners to influence the future product accordingly. By providing your feedback (e.g. in the SAP Community), you accept that intellectual property rights of the contributions or derivative works shall remain the exclusive property of SAP.

## Example Code

Any software coding and/or code snippets are examples. They are not for productive use. The example code is only intended to better explain and visualize the syntax and phrasing rules. SAP does not warrant the correctness and completeness of the example code. SAP shall not be liable for errors or damages caused by the use of example code unless damages have been caused by SAP's gross negligence or willful misconduct.

## Bias-Free Language

SAP supports a culture of diversity and inclusion. Whenever possible, we use unbiased language in our documentation to refer to people of all cultures, ethnicities, genders, and abilities.



© 2023 SAP SE or an SAP affiliate company. All rights reserved.

No part of this publication may be reproduced or transmitted in any form or for any purpose without the express permission of SAP SE or an SAP affiliate company. The information contained herein may be changed without prior notice.

Some software products marketed by SAP SE and its distributors contain proprietary software components of other software vendors. National product specifications may vary.

These materials are provided by SAP SE or an SAP affiliate company for informational purposes only, without representation or warranty of any kind, and SAP or its affiliated companies shall not be liable for errors or omissions with respect to the materials. The only warranties for SAP or SAP affiliate company products and services are those that are set forth in the express warranty statements accompanying such products and services, if any. Nothing herein should be construed as constituting an additional warranty.

SAP and other SAP products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of SAP SE (or an SAP affiliate company) in Germany and other countries. All other product and service names mentioned are the trademarks of their respective companies.

Please see <https://www.sap.com/about/legal/trademark.html> for additional trademark information and notices.