



Operations Guide | PUBLIC

Software Provisioning Manager 1.0 SP39

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System Copy for SAP Systems Based on the Application Server ABAP of SAP NetWeaver 7.3 EHP1 to 7.52 on UNIX

**Target Databases: SAP ASE; SAP MaxDB; Oracle; IBM Db2 for z/OS; IBM Db2
for Linux, UNIX, and Windows**

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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 2998013 , 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 3346502 .
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 2998013 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 2998013 .
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	<p>Updated version for software provisioning manager 1.0 SP27 (SL Toolset 1.0 SP27)</p> <ul style="list-style-type: none"> New Features: <ul style="list-style-type: none"> Oracle 18 c or higher: Support of Transparent Data Encryption (TDE), documented in: <i>New Features, SAP System Database Parameters, Support of Oracle Transparent Data Encryption (Oracle TDE)</i>
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)

Version	Date	Description
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"> • New Features: <ul style="list-style-type: none"> • 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> • Secure ABAP message server connection, documented in: <i>New Features, SAP System Parameters</i> • Database Migration Option Preparation: Support of Oracle Database, documented in: <i>New Features, Preparing Target Database Oracle</i> • Using <code>SAPUT001</code> for table splitting, documented in: <i>New Features, Table Splitting, Preparing the Table Split</i> • <code>LOADTOOLS</code> . <code>SAR</code> archive in Software Provisioning Manager enabled for NUC, documented in: <i>New Features, Downloading and Extracting the Software Provisioning Manager Archive</i> • Enabling IPv6, documented in: <i>New Features, Prerequisites for Running the Software Provisioning Manager</i> • <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. • 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"> • 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>). • 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> • 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>

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"> New Features: <ul style="list-style-type: none"> 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. 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> Simplified additional application server instance installation, documented in: <i>New Features, Preparing the Installation Media, Downloading SAP Kernel Archives (Archive-Based Installation)</i> Support of Oracle 12.2., documented in: <i>New Features</i> Support of Oracle Database Vault, documented in: <i>New Features</i>.
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"> New Features: <ul style="list-style-type: none"> 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> Cleanup of operating system users, documented in: <i>SAP System Parameters, Creating Operating System Users and Groups</i> DMO preparation is now also enabled for SAP MaxDB and Oracle database , documented in: <i>Database Migration Option Preparation</i> . Refresh database content using a database backup enabled for SAP MaxDB , documented in: <i>Copying the Database Only - Refresh Database Content</i> .
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"> 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> Section Preparing the Media Required for Performing the Export [page 46] refactored, created subsections Downloading and Extracting the Software Provisioning Manager 1.0 Archive [page 46], Downloading Dedicated Kernel Archives for the Export [page 48]

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"> New Features: Database migration preparation for IBM Db2 for Linux, UNIX, and Windows, SAP ASE , documented in: Database Migration Option Preparation [page 147] Using RMOSSWPM*.SAR instead of SWPM*.SAR for outdated OS versions not supported by SAP kernel 7.40 and higher, documented in: Introduction Constraints
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"> Archive-Based Installation (see New Features [page 14]) Export option description corrected in Running Software Provisioning Manager [page 68] Correction in Sorted Versus Unsorted Unload [page 35]: Default was changed from “sorted” to “unsorted”
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 Databases: SAP ASE; SAP MaxDB; Oracle; IBM Db2 for z/OS; IBM Db2 for Linux, UNIX, and Windows

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**, using software provisioning manager 1.0 SP39, 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.

The following **target** databases are supported:

- IBM Db2 for Linux, UNIX, and Windows
- IBM Db2 for z/OS
- SAP MaxDB
- Oracle
- MS SQL Server
- SAP Adaptive Server Enterprise ("SAP ASE" for short)

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 \[page 24\]](#).

Using software provisioning manager 1.0 you can use [either database-specific methods or database-independent methods \[page 28\]](#).


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 \[page 13\]](#).



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 \[page 14\]](#).

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 .

Related Information

[About Software Provisioning Manager 1.0 \[page 13\]](#)

[New Features \[page 14\]](#)

[Naming Conventions \[page 20\]](#)

[Constraints \[page 22\]](#)

[Accessing the SAP Library \[page 24\]](#)

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 \[page 46\]](#)

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 Business Suite 7i 2016: <ul style="list-style-type: none">• EHP4 for SAP CRM 7.0 ABAP• EHP8 for SAP ERP 6.0 ABAP• EHP8 for SAP ERP 6.0 ABAP including SAP S/4HANA Finance 1605 SP03• EHP4 for SAP SRM 7.0 ABAP• EHP4 for SAP SCM 7.0 ABAP	SAP NetWeaver 7.5 SAP NetWeaver 7.4 Support Release 2 SAP NetWeaver 7.3 EHP1
SAP Business Suite 7i 2013 Support Release 2: <ul style="list-style-type: none">• EHP3 for SAP CRM 7.0 ABAP Support Release 2• EHP7 for SAP ERP 6.0 ABAP Support Release 2• EHP7 for SAP ERP 6.0 ABAP including SAP Simple Finance 1.0 / 1503• EHP3 for SAP SRM 7.0 ABAP Support Release 2• EHP3 for SAP SCM 7.0 ABAP Support Release 2	SAP NetWeaver 7.5 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

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](https://help.sap.com) for your SAP product at <https://help.sap.com> > <Search your SAP Product> > <Select your SAP Product Version> > [What's New](#) >.

Feature	Description	Availability
IBM Db2 for Linux, UNIX, and Windows only: Enhanced support for range partitioning and inline LOB size	The software provisioning manager now creates partition-specific tablespaces that are listed in the file DB6_PART_TABLESPACES.LST. This file is created by the ABAP program SMIGR_CREATE_DDL along with other SQL files for range-partitioned tables. For more information, see SAP Note 3208238 .	
New SAPinst Framework Version 753	The SAPinst framework patch level has been upgraded from version 749 (SAP Note 2393060 <i>SAPinst Framework 749 Central Note</i>) to 753. For more information, see SAP Note 3207613 <i>SAPinst Framework 753 Central Note</i> .	software provisioning manager 1.0 SP36 (SL Toolset 1.0 SP36)
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 3104875 .	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)
Oracle 18 c or higher: Support of Transparent Data Encryption (TDE)	Software provisioning manager 1.0 supports Oracle Transparent Data Encryption (TDE) for SAP NetWeaver-based systems. For more information, see Support of Oracle Transparent Data Encryption (Oracle TDE) [page 213] .	software provisioning manager 1.0 SP27 (SL Toolset 1.0 SP27)
Support of Oracle 18	You can now perform all software provisioning manager 1.0 tasks (installation, system copy, system rename) for SAP systems with the Oracle 18 database. For more information, see https://support.sap.com/pam .	software provisioning manager 1.0 SP25 (SL Toolset 1.0 SP25)
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 https://blogs.sap.com/2018/11/10/new-look-for-software-provisioning-manager/ .	software provisioning manager 1.0 SP24, PL05 (SL Toolset 1.0 SP24)
IBM Db2 for Linux, UNIX, and Windows: Dropping the database schema automatically while running software provisioning manager to refresh the database instance or content	You can now drop the database schema automatically while running the Database Refresh or Move option or the Refresh Database Content option by choosing to drop the schema on screen <i>IBM Db2 for Linux, UNIX, and Windows - Drop Existing Schemas</i> . For more information, see Copying the Database Only – Refresh Database Instance [page 128] and Copying the Database Only - Refresh Database Content on IBM Db2 for Linux, UNIX, and Windows [page 135] .	software provisioning manager 1.0 SP23 (SL Toolset 1.0 SP23)
software provisioning manager Log Files Improvements	software provisioning manager log files are now available immediately after software provisioning manager has been started, that is before a product has been selected on the Welcome screen. For more information, see Useful Information about Software Provisioning Manager [page 74] and Troubleshooting with Software Provisioning Manager [page 84] .	software provisioning manager 1.0 SP22 (SL Toolset 1.0 SP22)

Feature	Description	Availability
Database Migration Option Preparation: Support of Oracle Database	<p>With the software provisioning manager, you can now perform preparation steps for Database Migration Option (DMO) for the Software Update Manager (SUM).</p> <p>In addition to the already supported databases, Oracle database is now supported.</p> <p>For more information, see Preparing Target Database Oracle [page 153].</p>	software provisioning manager 1.0 SP22 (SL Toolset 1.0 SP22)
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 Preparing the Table Split [page 60].</p> <div> <p>i Note</p> <p>This feature is related to features LOADTOOLS . SAR <i>archive in Software Provisioning Manager enabled for NUC</i> in this table below and LOADTOOLS . SAR <i>archive in software provisioning manager</i> 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<Support_Package_Number>_<Version_Number> . SAR are now also enabled for a system copy using non-Unicode (NUC) SAP kernel version 7.40 or higher.</p> <p>For more information, see Downloading and Extracting the Software Provisioning Manager 1.0 Archive [page 46]</p> <div> <p>i Note</p> <p>This feature enhances feature LOADTOOLS . SAR <i>archive in Software Provisioning Manager</i> of software provisioning manager 1.0 SP21 (SL Toolset 1.0 SP21) (see entry LOADTOOLS . SAR <i>archive in software provisioning manager</i> 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 automatically by the software provisioning manager during the Define Parameters phase while processing the Media Browser screens. The software provisioning manager only accepts media whose digital signature has been checked.</p> <p>For more information, see Preparing the Media Required for Performing the Export [page 46] and Running the software provisioning manager [page 68].</p>	software provisioning manager 1.0 SP21 (SL Toolset 1.0 SP21)

Feature	Description	Availability
LOADTOOLS .SAR archive in software provisioning manager	<p>An up-to-date version of the load tools - such as R3load, R3szchk, R3ldctl, SAPu001 - 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 2472835. For a system copy using Unicode kernel version 740 or higher, the load tools from the SWPM10SP<Support_Package_Number>_<Version_Number> .SAR are used automatically.</p> <p>For more information, see Downloading and Extracting the Software Provisioning Manager 1.0 Archive [page 46]</p>	software provisioning manager 1.0 SP21 (SL Toolset 1.0 SP21)
Support of Oracle Database Vault	<p>Oracle Database Vault 12c has been certified for SAP products that are based on SAP NetWeaver technology.</p> <p>You can now copy an SAP system with Oracle Database 12c and configure Oracle Database Vault in the database of the target system.</p> <p>Oracle Database Vault is supported for all system copy methods [page 28] described in this documentation.</p> <p>For more information, see SAP Note 2218115.</p>	software provisioning manager 1.0 SP21 (SL Toolset 1.0 SP21)
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 Useful Information about Software Provisioning Manager [page 74] , Running Software Provisioning Manager [page 68] .	software provisioning manager 1.0 SP20 (SL Toolset 1.0 SP20)
Database Migration Option Preparation: Support of SAP MaxDB	<p>With the software provisioning manager, you can now perform preparation steps for Database Migration Option (DMO) for the Software Update Manager (SUM).</p> <p>In addition to the already supported databases, SAP MaxDB is now supported.</p> <p>For more information, see Database Migration Option Preparation [page 147].</p>	software provisioning manager 1.0 SP20 (SL Toolset 1.0 SP20)
Cleanup of Operating System Users	You can now specify during the Define Parameters phase that the operating system users are to be removed from group sapinst after the execution of software provisioning manager has completed.	software provisioning manager 1.0 SP20 (SL Toolset 1.0 SP20)
Refresh Database Content for SAP MaxDB	<p>For SAP MaxDB you can now refresh the content of an existing database using a database backup.</p> <p>For more information, see Copying the Database Only - Refresh Database Content [page 129].</p>	software provisioning manager 1.0 SP20 (SL Toolset 1.0 SP20)

Feature	Description	Availability
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 Downloading and Extracting the Software Provisioning Manager 1.0 Archive [page 46] .</p> <p>In addition, check SAP Note 1680045 whether additional information is available.</p>	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 <i>Prerequisites</i> in System Copy Procedure [page 52] .	software provisioning manager 1.0 SP19 (SL Toolset 1.0 SP19)
Use Dedicated Kernel for System Copy	During the <i>Define Parameters</i> want to use for the system copy. For more information, see phase of the source system export, you can now specify dedicated SAP kernel archives that you Downloading Dedicated Kernel Archives for the Export [page 48] .	software provisioning manager 1.0 SP19 (SL Toolset 1.0 SP19)
Refresh Database Content for all Databases Except SAP MaxDB	<p>For all databases except SAP MaxDB, you can now refresh the content of an existing database using a database backup.</p> <p>For more information, see Copying the Database Only - Refresh Database Content [page 129].</p>	software provisioning manager 1.0 SP19 (SL Toolset 1.0 SP19)
Database Migration Option Preparation	<p>With software provisioning manager you can now perform preparation steps for Database Migration Option (DMO) for Software Update Manager (SUM).</p> <p>Currently the following databases are supported:</p> <ul style="list-style-type: none"> • SAP ASE • IBM Db2 for Linux, UNIX, and Windows <p>For more information, see Database Migration Option Preparation [page 147].</p>	software provisioning manager 1.0 SP18 (SL Toolset 1.0 SP18)
Archive-Based Installation	You can now download the required installation archives instead of the complete SAP kernel installation media. For more information, see section <i>Downloading Specific Installation Archives (Archive-Based Installation)</i> in section <i>Preparing the Installation Media</i> in the target system installation guide [page 24] ..	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><SAPSID></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"> 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: http://help.sap.com/nw75 ►► <i>Installation and Upgrade</i> ► SAP NetWeaver 7.5 is Unicode only The primary application server instance directory has been renamed from <code>/usr/sap/<SAPSID>/DVEBMGS<Instance_Number></code> to <code>/usr/sap/<SAPSID>/D<Instance_Number></code>. Declustering and depooling of tables during the installation is enabled by default. For more information, see SAP Note 1892354 . 	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>Note</p> <p>This feature is only available for Unicode systems.</p> </div> <div> <p>Caution</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 Welcome 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	<p>Valid for all Databases except of SAP ASE:</p> <p>You can now execute R3szchk in parallel. Using this feature you can improve the runtime of the export.</p>	software provisioning manager 1.0 SP08 (SL Toolset 1.0 SP13)
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. For more information, see Prerequisites for Running Software Provisioning Manager [page 65].</p>	software provisioning manager 1.0 SP07 (SL Toolset 1.0 SP12)
Option Verify Signed Media	<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 1979965.</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 \[page 51\]](#) or [Database-Specific System Copy \[page 94\]](#) 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 \[page 51\]](#) method.
- **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
<SAPSID>	SAP system ID	—
<S_HOST>	System name of the source host	Command <code>hostname</code>
<T_HOST>	System name of the target host	Command <code>hostname</code>
<S_SAPSID>	SAP system ID of the source system	<SAPSID> of the original system
<T_SAPSID>	SAP system ID of the target system	<SAPSID> of the target system
<S_DBSID>	Database ID of the source system	<DBSID> of the original system
<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 recommends not migrating from the SAP HANA database to another database to remain future-proof.
- **Oracle Database:** [Refresh Database Instance \[page 129\]](#) and [Refresh Database Content \[page 140\]](#) are **not** supported for [Database Instance Installation on Oracle Automatic Storage Management \[page 215\]](#) and [Installing Oracle Real Application Clusters on your Target System \[page 216\]](#).
- If SAP HANA is the source database, you **cannot** use the [Database Independent System Copy \[page 51\]](#) 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.
- 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 \[page 51\]](#). 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 126], Refresh Database Instance [page 128], or Copying the Database Only - Refresh Database Content [page 129] 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/n4efFg>.
- 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<>.
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<>.

- 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* ►

2 Planning

This section describes how to plan your system copy.

[Before You Start \[page 26\]](#)

[Use Cases for System Copy \[page 27\]](#)

[System Copy Methods \[page 28\]](#)

[Creating a System Copy Plan \[page 29\]](#)

Create a plan to perform the system copy.

[Basic Planning Aspects and Parameters \[page 30\]](#)

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

[System Copy and Migration Optimization \[page 33\]](#)

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

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 \[page 89\]](#), but refers for all steps that are identical with a new system installation to the appropriate operating system and database-specific [installation guide \[page 24\]](#).
 - *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

- **Oracle only:** You cannot create standby systems with a system copy.
- You should perform 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 \[page 51\]](#).

i Note

If SAP HANA is the source database, you **cannot** use the [Database Independent System Copy \[page 51\]](#) 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`.

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

Some database vendors offer specific tools for copying a database. These tools allow you to:

- Restore a backup of one database (source database) in another one (target database) (backup method)
- Unload the source database and load the data into the target database

For more information, see [Database-Specific System Copy \[page 94\]](#).

- **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 \[page 126\]](#).
- You can **move a database instance** to a different host within your system. For more information, see [Copying the Database Only – Move Database Instance \[page 126\]](#).
- 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 \[page 128\]](#).
- You can **refresh the content of an existing database** without having to copy the primary application server instance and to reinstall additional applications servers.

→ 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 \[page 129\]](#)

⚠ 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 \[page 65\]](#).
2. For the import, choose the relevant system copy options as described in the process flows of the [system copy procedure \[page 52\]](#).

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 \[page 24\]](#) 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 \[page 24\]](#), 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 \[page 24\]](#) 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 \[page 24\]](#), 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.

Special Prerequisites for SAP Business Warehouse (SAP BW) and IBM Db2 for Linux, UNIX, and Windows (IBM Db2) 10.5 and higher

For special prerequisites and required procedures for SAP BW and IBM Db2, including the implementation of DB2 BLU acceleration, see the appendix of the database administration guide *SAP Business Warehouse on IBM DB2 for Linux, UNIX, and Windows: Administration Tasks*, available at https://help.sap.com/viewer/db6_admin.

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 \[page 33\]](#)

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

[Sorted Versus Unsorted Unload \[page 35\]](#)

[Package Splitting \[page 36\]](#)

[Table Splitting \[page 37\]](#)

[R3load Options \[page 39\]](#)

This section provides information about available R3load options.

[Migration Monitor \[page 40\]](#)

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 \[page 40\]](#)

[Database-Specific Central Notes \[page 41\]](#)

For some databases there are central SAP Notes where you can find information about how to optimize system copy and migration.

2.6.1 Database Tuning

This is just a list of database parameters which could help you to tune your database . 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 \[page 24\]](#) 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 \[page 24\]](#) , 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

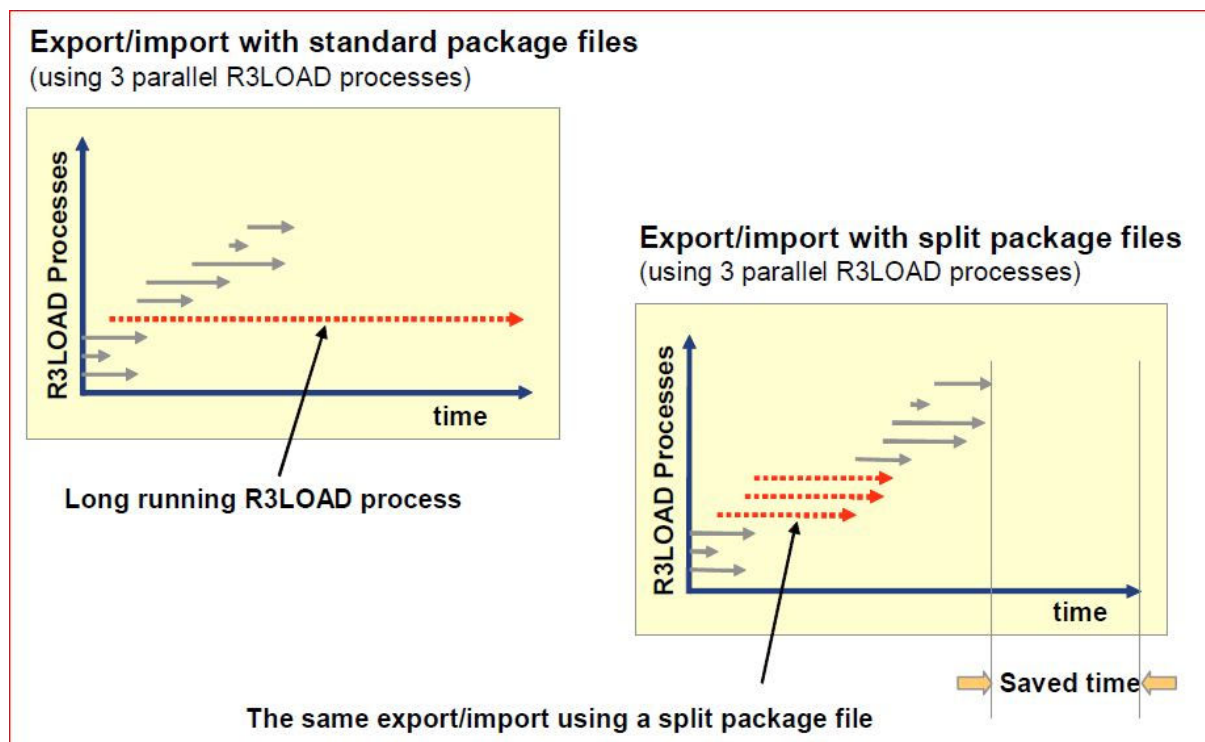
During a system copy, you can perform the data export either “sorted” or “unsorted”.

The default setting is [Use Unsorted Unload](#), unless your target database is SAP MaxDB. SAP recommends that you stick to this default value. Only if your target database is MaxDB, make sure that the [Use Unsorted Unload](#) option is deselected.

If the [Use Unsorted Unload](#) option is chosen, R3load makes use of the unsorted export feature as much as possible.

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:



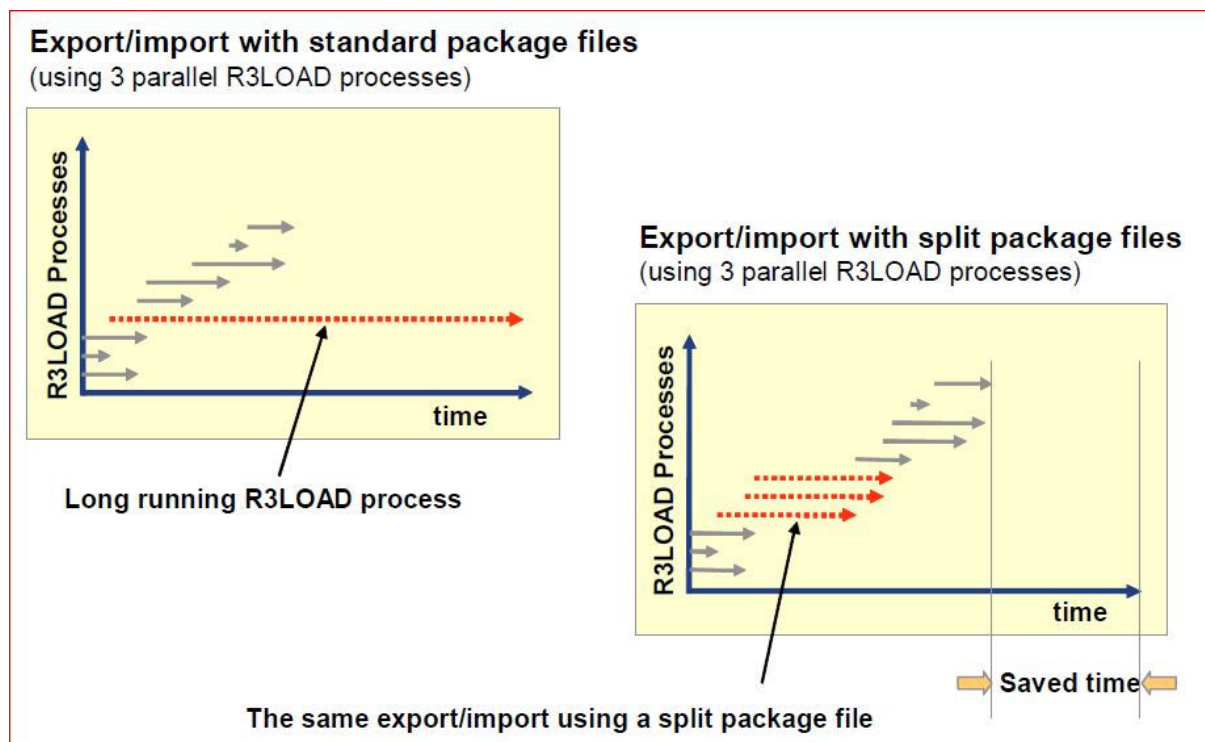
The software provisioning manager by default applies `Package/STR Splitting`. The software provisioning manager prepares and runs the Package Splitter.

Related Information

[Using the Package Splitter \[page 202\]](#)

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 \[page 170\]](#)
- 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.

2.6.8 Database-Specific Central Notes

For some databases there are central SAP Notes where you can find information about how to optimize system copy and migration.

- For more information about **MS SQL Server**-specific migration optimization options, see SAP Note [1054852](#)  (*Recommendations for migration to MS SQL Server*).
- For more information about **SAP ASE 16.0**-specific migration optimization options, see SAP Note [1680803](#)  (*Migration to SAP Sybase ASE - Best Practice*).

Related Information

[System Copy and Migration Optimization \[page 33\]](#)

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 \[page 24\]](#) 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 \[page 24\]](#), and then continue the navigation as described below.

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

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 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](#).
7. To avoid stopping the database due to a log directory being full, make sure that the log backup is enabled during the import.
8. **Oracle Database only:** If your source system has Oracle Database Vault (DV) enabled, and you want to enable DV on the target system as well, you need the password of user `secadmin / c##secadmin` during the [software provisioning manager import procedure \[page 90\]](#). For more information, see SAP Note [2218115](#).
9. **Oracle Database only:** Before performing System Copy from any database to Oracle, check the contents of the TAORA and IAORA database tables and ensure that the entries are consistent.

You can use the upgrade-specific SAP Note [541542](#) as a reference to check for the correct entries of the table. If there are any inconsistencies, they must be corrected on the source system before performing the export.

If there are inconsistent entries, system copy import fails with an error due to wrong tablespace names for TABARTs USER and USER1 in the Oracle specific tables TAORA and IAORA on the source system. These tables are not checked for consistency on the source system if the source database is not Oracle. This inconsistency in the source system is caused due to the usage of both old and new tablespace layout on the source system.
10. Prepare the [media required for the export \[page 46\]](#):
 - a. Prepare the software provisioning manager archive as described in [Downloading and Extracting the Software Provisioning Manager 1.0 Archive \[page 46\]](#).
 - 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 \[page 48\]](#).
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:

1. Defer the migration until the incremental conversion has finished.
2. 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** .
 - 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](#).

3.3 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 \[page 24\]](#) for the operating system platform and database of your target system.

[Downloading and Extracting the Software Provisioning Manager 1.0 Archive \[page 46\]](#)

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 \[page 48\]](#)

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

3.3.1 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.

i 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 sapcryptolib_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:

i 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>
```

i 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.

3.3.2 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 \[page 68\]](#) 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 SAPEXE<Version>.SAR is of version **7.45**, then SAPEXEDB<Version>.SAR must also be of version **7.45**.

- SAPEXE<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>*
 - SAPEXEDB<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, 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](#) .

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.

Existing Target System

If the target system already exists and **if you do not plan to perform an MCOD installation**, delete the database on the target system before the import. For more information, see chapter *Installation of Multiple Components in One Database* in the installation documentation for your SAP component.

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.

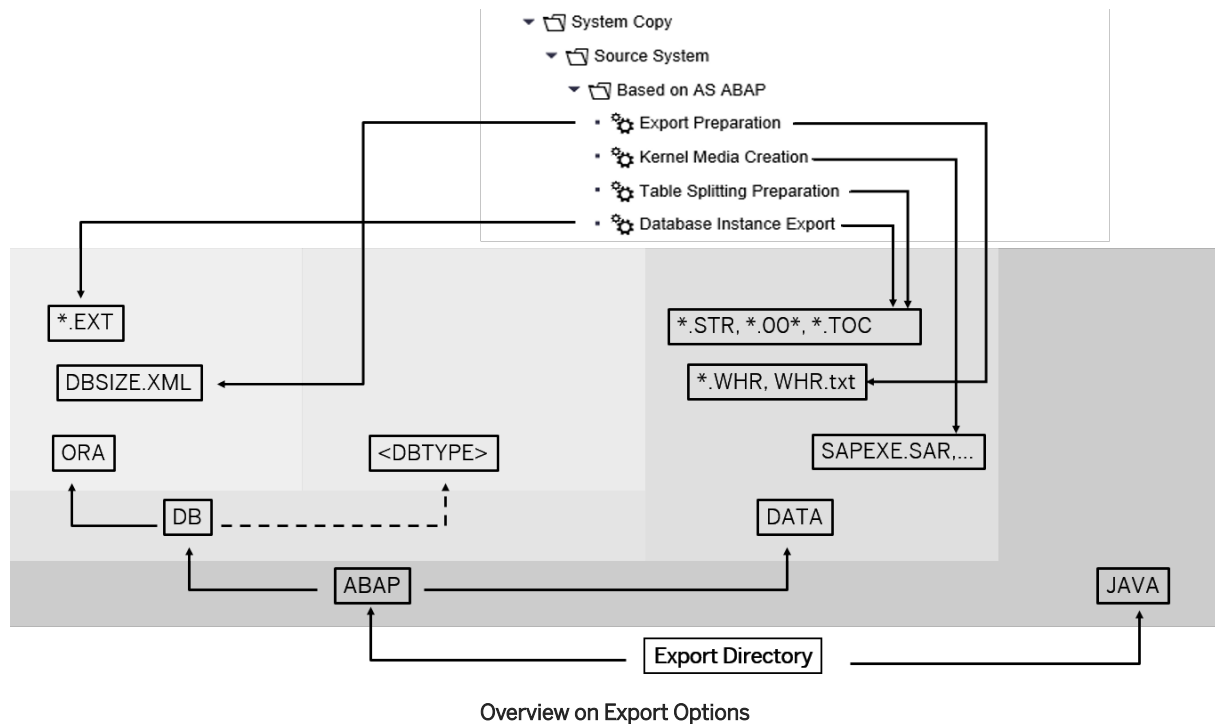
i Note

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 \[page 68\]](#) 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.



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 \[page 42\]](#).
 2. [Generate DDL statements \[page 58\]](#).

3. [Prepare the system for table splitting \[page 60\]](#) (optional).
4. You [run the software provisioning manager \[page 68\]](#) 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 \[page 64\]](#).
6. [Start the software provisioning manager \[page 68\]](#) 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.

i Note

If R3load processes fail due to an error, solve the problem, and perform the restart as described in [Restarting R3load Processes \[page 87\]](#).

⚠ Caution

If your database instance is running on HP PA-RISC, you must proceed as described in **SAP Note 884452**.

3. If you want to perform [table comparison with Software Update Manager \(SUM\) \[page 197\]](#), proceed as follows:
 1. Stop all instances of the source system once the export has completed.
 2. [Run table comparison \[page 199\]](#) 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 \[page 89\]](#), but refers for all steps that are identical with a new system installation to the appropriate operating system and database-specific [installation guide \[page 24\]](#).

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

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 \[page 64\]](#) 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 \[page 64\]](#) on the source system.
 2. You [transfer the export files to the standard system target host \[page 89\]](#).
 3. You [install the target system \[page 90\]](#).If you did **not** prepare the export on the source system, you install the target system.
For more information, see [Installing the Target System \[page 90\]](#)
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 \[page 42\]](#).
 2. [Generate DDL statements \[page 58\]](#).
 3. You [run the software provisioning manager \[page 68\]](#) 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 \[page 60\]](#) (optional).
5. If required, you [prepare parallel export and import \[page 64\]](#).
6. [Run the software provisioning manager \[page 68\]](#) 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.

i Note

If R3load processes fail due to an error, solve the problem, and perform the restart as described in [Restarting R3load Processes \[page 87\]](#).

⚠ Caution

If your database instance is running on HP PA-RISC, you need to proceed as described in **SAP Note 884452**.

3. If you want to perform [table comparison with the Software Update Manager \(SUM\) \[page 197\]](#), proceed as follows:
 1. Stop all instances of the source system once the export has completed.
 2. [Run table comparison \[page 199\]](#) 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.

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 \[page 89\]](#), but refers for all steps that are identical with a new system installation to the appropriate operating system and database-specific [installation guide \[page 24\]](#).

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 on the **database instance host**:
 - If you have already [prepared the export \[page 64\]](#) 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 \[page 64\]](#) 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 \[page 89\]](#).
 3. You install the database instance of the target system.
For more information, see [Installing the Target System \[page 90\]](#).
- 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 \[page 89\]](#).
 - You install the database instance of the target system.
For more information, see [Installing the Target System \[page 90\]](#).

⚠ 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

SAP Business Warehouse (SAP BW), database migration only: You must ensure that no further changes (such as, activations, data loads to cubes, or field changes) are executed in the SAP BW system after you have called the SMIGR_CREATE_DDL report and before you export the data.

Context

- You must perform this procedure **before** starting the software provisioning manager.
- 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 SΞ38 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

Only enter a database version that is available in the value help.

- **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.

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.

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 `SAPXEDB.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 \[page 46\]](#)
[System Copy Procedure \[page 52\]](#)

4.1.3 Preparing the Table Split

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

Prerequisites

- For the following databases, we recommend that you create an index on the column listed in the hints file for the table you want to split before starting `R3ta` :
 - IBM Db2 for z/OS (Only create a temporary index if you want to perform an unsorted unload.)
 - Oracle

For more information, see [Creating a Temporary Index \(R3ta Only\)](#) [page 62].

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 170].

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](#).

2. Start the software provisioning manager as described in [Running Software Provisioning Manager \[page 68\]](#).
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 - `SAPuptool` 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 `SAPupTool`, 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 \(R3ta Only\) \[page 62\]](#)

[Creating a Temporary Index \(R3ta Only\) \[page 62\]](#)

[Processing Split Tables \[page 187\]](#)

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 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 the following steps that are required to set up the target database:

- Creating the export directory structure
- Calculating the size of the target database
- Creating a database size file named `DBSIZE.XML`

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 \[page 65\]](#).

This step creates the export directory structure, calculates the size of the target system and generates the `DBSIZE.XML` that is required to set up the target system.

2. Share or transfer the complete export directory with its structure and the generated `DBSIZE.XML` file 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 \[page 89\]](#).

Related Information

[About the Migration Monitor \[page 170\]](#)

[Transferring the Export Files to the Target Host \[page 89\]](#)

4.1.5 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 \[page 52\]](#).

Related Information

[Prerequisites for Running Software Provisioning Manager \[page 65\]](#)

[Running Software Provisioning Manager \[page 68\]](#)

4.1.5.1 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 \[page 68\]](#). 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 \[page 74\]](#).

- 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 \[page 74\]](#).

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 `cs` 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
cputime	unlimited
filesize	unlimited
datasize	unlimited
stacksize	8192 KB
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 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 \[page 76\]](#) 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.

4.1.5.2 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 \[page 65\]](#).

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 \[page 74\]](#).

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 \[page 46\]](#).

→ 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.

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>]
*****
...
```

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 74].
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 65]) 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

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 \[page 51\]](#).

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 \[page 94\]](#).

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.


i Note

IBM Db2 for Linux, UNIX, and Windows only: When you are asked for the security administrator, enter a user that has DB2 `SECADM` authorities. By default, `db2<dbsid source>` has these authorities.

⚠ 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 \[page 74\]](#).

Related Information

[Useful Information about Software Provisioning Manager \[page 74\]](#)

[Restarting Interrupted Processing of Software Provisioning Manager \[page 81\]](#)

[Troubleshooting with Software Provisioning Manager \[page 84\]](#)

4.1.5.2.1 Additional Information about Software Provisioning Manager

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

[Useful Information about Software Provisioning Manager \[page 74\]](#)

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 \[page 76\]](#)

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 \[page 81\]](#)

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

[Troubleshooting with Software Provisioning Manager \[page 84\]](#)

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

[Troubleshooting during the Export Process \[page 85\]](#)

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 \(SAP Support Experts Only\) \[page 86\]](#)

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

4.1.5.2.1.1 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 \[page 65\]](#).

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_instdir` 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_instdir` directory as soon as the latter has been created.
If you want the `sapinst_instdir` 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=<Directory></code> <code>export TEMP</code>
C shell (csh)	<code>setenv TEMP <Directory></code>
Korn shell (ksh)	<code>export TEMP=<Directory></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 \[page 76\]](#) 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`.

4.1.5.2.1.2 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 \[page 74\]](#)) 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_GUISERVER=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_GUISERVER=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:\sapdvs\KERNEL
SAPINST.CD.PACKAGE.LOAD = C:\sapdvs\LOAD
SAPINST.CD.PACKAGE.RDBMS = C:\sapdvs\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
`SAPEXE_<Version>.SAR`

Procedure

1. You plan and prepare the run as described in [Planning \[page 26\]](#) and [Preparation \[page 42\]](#).
2. Create your input parameter file as follows:
 1. Start software provisioning manager as described in [Running Software Provisioning Manager \[page 68\]](#).
 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 "inifile.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 "inifile.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 \[page 68\]](#) 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 \[page 155\]](#).


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 \(Non-Observer mode\)](#) 

4.1.5.2.1.3 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
Retry	<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 Retry.</p> <p>If the same or a different error occurs, the software provisioning manager displays the same dialog box again.</p>
Stop	<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>
Continue	<p>The software provisioning manager continues the installation from the current point.</p>
View Log	<p>Access installation log files.</p>

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 \[page 68\]](#).
2. Make sure that the media required for the export are still available.

For more information, see [Preparing the Media Required for Performing the Export \[page 46\]](#).

→ 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 **nomaplace**.

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>]
*****
...
```

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 \[page 74\]](#).
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 \[page 65\]](#)) 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
<i>Perform a new run</i>	<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_<Day>_<Month>_<Year>_<Hours>_<Minutes>_<Seconds></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>
<i>Continue with the existing one</i>	<p>The software provisioning manager continues the interrupted export for system copy from the point of failure.</p>

4.1.5.2.1.4 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 \[page 74\]](#).

- 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 \[page 81\]](#).
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](#).

4.1.5.2.1.5 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.

4.1.5.2.1.6 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 \[page 65\]](#).

Procedure

1. Start the software provisioning manager from the command line as described in [Running Software Provisioning Manager \[page 68\]](#) 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.

4.1.5.3 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 \[page 195\]](#)) 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.

4.1.6 Setting Up the Target System

Related Information

[Transferring the Export Files to the Target Host \[page 89\]](#)

[Installing the Target System \[page 90\]](#)

4.1.6.1 Transferring the Export Files to the Target Host

This section describes how to transfer the complete export directory with its structure and the generated `DBSIZE.XML` file 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.

4.1.6.2 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.
To find out the size of the export and the sizes of the `tablespaces` or `dbspaces` that will be created, look at the file `DBSIZE.XML`, which is located in the following directory:
`<EXPDIR>/DB/<DATABASE>`
- **SAP MaxDB only:** If the database platform of your target system is **SAP MaxDB**, you must reserve at least twice as much space as specified in the `DBSIZE.XML` file. During the import, monitor the remaining free space in the database using the SAP MaxDB administration tools Database Manager or Database Studio, and increase it if required.
- 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 \[page 128\]](#)) and the refresh database content scenario (see [Copying the Database Only - Refresh Database Content \[page 129\]](#)), 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 \[page 24\]](#).

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 \[page 52\]](#)), 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 \[page 52\]](#)

⚠ 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 \[page 157\]](#) **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_inst_dir`) 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 \[page 87\]](#).
 - 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 \(SUM\) \[page 197\]](#).

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 \[page 199\]](#)
3. Start the instances of the target system.

i Note

If you have to restart failed `R3load` processes, see [Restarting R3load Processes \[page 87\]](#).

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`

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 Source System (Export)

1. **Oracle only:** You [generate the control file structure for the target database \[page 100\]](#).
2. **Oracle only:** If required, you [create an offline backup of the source database \[page 108\]](#).

Process Flow on the Target System

i Note

For the target system installation, you use the [installation guide \[page 24\]](#) for your target operating system and database.

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

1. **Oracle only:** You [prepare the target system \[page 104\]](#):
 1. Start the software provisioning manager as described in the installation guide and follow the instructions on the software provisioning manager screens until the software provisioning manager requests you to install the database software and to perform the database backup/restore.
 2. You create the database file system (if not yet existing).
 3. You install the database software.
2. 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.

3. To complete the system copy, you [perform the follow-up activities \[page 155\]](#).

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 Source System (Export)

1. **Oracle only:** On the **database instance host** of the source system, you [generate the control file structure for the target database \[page 100\]](#).
2. **Oracle only:** If required, on the **database instance host**, you [create an offline backup of the source database \[page 108\]](#).

Process Flow on the Target System

i Note

For the target system installation, you use the [installation guide \[page 24\]](#) for your target operating system and database.

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

1. **Oracle only:** You [prepare the target system \[page 104\]](#):
 1. On the **database instance host**, start the software provisioning manager as described in the installation guide and follow the instructions on the software provisioning manager screens until the software provisioning manager requests you to install the database software and to perform the database backup/restore.
 2. On the **database instance host**, you create the database file system (if not yet existing).
 3. On the **database instance host**, you install the database software.

2. On the **database instance host**, 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.

3. To complete the system copy, you [perform the follow-up activities \[page 155\]](#).

5.1 Oracle-Specific Procedure

Purpose

In an SAP system environment, you can create a homogeneous copy of an Oracle database by copying database files. This method is suitable for creating an exact copy of an existing database. The source of the copy can be an online or offline backup, or the file system of your source host.

You use the software provisioning manager for the installation on the target system host as described in the installation documentation for your SAP component. Only the software provisioning manager steps for setting up and loading the database steps are different.

Advantages

- You can use existing offline backups (provided that redo logs were cleaned up with forced log switches).
- This method is faster than the R3load method.

Disadvantages

- Offline backup/copy of database files in a heterogeneous environment is not possible because the hardware of the source and target systems must be binary-compatible.
- Source system host and target system host must be different.
- You must shut down the SAP system and the database during offline backup/copy of database files.
- You cannot change the database schema and the tablespace names.

Prerequisites

- You must use the same Oracle release and patch level for your database in the source and target system.

- The source and target systems must run on different hosts for security reasons.
- The source and target systems must be binary compatible.

i Note

You can also perform a system copy from 32-bit systems to 64-bit systems and the other way around (same operating system assumed) even if source and target system are not binary compatible.

- If your source system uses the `US7ASCII` character set, you must choose this character set when installing the target system. The software provisioning manager prompts for the character set during the installation (key: `Database Character Set`). The installation default is `WE8DEC` or `UTF8` for Unicode systems. To find out the character set used by the source system, connect to the source database as user `sap<schemaid>` or `sap<pr3>` with `sqlplus` and enter: `SELECT * FROM V$NLS_PARAMETERS;`
- If your source system has Oracle Database Vault (DV) enabled, and you want to enable DV on the target system as well, you need the password of user `secadmin / c##secadmin` during the [software provisioning manager import procedure \[page 90\]](#). For more information, see SAP Note [2218115](#).

Oracle Storage-Based System Copy Methods Available in the software provisioning manager

You can choose between the following methods:

- Database already recovered, continue with database-specific post activities
You have already performed backup/restore with Oracle-specific methods. In this case, the software provisioning manager does not need to perform the backup/restore. You just have to ensure that the restored Oracle database on your target system is up and running.
- [Performing Online or Offline Recovery with saphostctrl \[page 97\]](#)
- [Using a CONTROL.SQL File Created by the ORABRCOPY Tool \[page 100\]](#)

Related Information

[Database-Specific System Copy \[page 94\]](#)

5.1.1 Performing Online or Offline Recovery with “saphostctrl”

This section describes how to perform a recovery using `saphostctrl`.

For the **offline** recovery method, we recommend that you shut down the database. Alternatively, the software provisioning manager can also make an instance recovery of the database if it has not been shut down before the copy process.

For the **online** recovery method, you have to set the database to a backup mode and the backup control files and the Oracle archives will be copied to an existing shared directory.

A “shared directory” can be any directory path which the source system and the target system can access. The archives and also the `init<SID>.ora` files from the source system will be saved in this directory

Restrictions

You **cannot** change the database schemas `SAP<SchemaId>` and `SAP<SchemaId>DB`. There is no “move” schema.

The `<DBSID>` can be changed because the rename process is able to create new control files with a new `<DBSID>`.

The `<SAPSID>` can be also changed.

Related Information

[Performing Online Recovery \[page 98\]](#)

[Performing Offline Recovery \[page 99\]](#)

5.1.1.1 Performing Online Recovery

For the **online** recovery method, you have to proceed as follows.

Procedure

1. You can set the source database to a backup mode using the following command:

```
saphostctrl -user sapadmsaphostctrl -function PrepareDatabaseCopy -dbname  
<DBSID> -dbtype ora -dbconfdir <shared_directory> -copymethod Online -timeout -1
```

2. Back up the data files, for example using image copy or snapshot technology.
3. After the database backup has finished, you have to set the database back to a normal mode using the following command:

```
saphostctrl -function FinalizeDatabaseCopy -dbname <DBSID> -dbtype ora  
-dbconfdir <shared_directory> -copymethod Online -timeout -1
```

4. Start the target system installation and follow the instructions on the software provisioning manager screens.

Start the target system installation as described in the *Installation Guide - Installation of SAP Systems Based on the Application Server ABAP of SAP NetWeaver 7.3 EHP1 to 7.52 on UNIX : Oracle* (see [Accessing the Installation Guides \[page 24\]](#)).

5. On the *Performing Oracle Storage Based System Copy* screen, select option *Online or Offline Recovery Method with saphostctrl*

5.1.1.2 Performing Offline Recovery

For the **offline** recovery method, you have to proceed as follows.

Procedure

1. Shut down the source database.
2. Back up the data files, for example using image copy or snapshot technology.
3. Start the target system installation and follow the instructions on the software provisioning manager screens.

Start the target system installation as described in the *Installation Guide - Installation of SAP Systems Based on the Application Server ABAP of SAP NetWeaver 7.3 EHP1 to 7.52 on UNIX : Oracle* (see [Accessing the Installation Guides \[page 24\]](#)).

4. On the Performing Oracle Storage Based System Copy screen, select option *Online or Offline Recovery Method with saphostctrl*.
5. Leave the dialog field of the `<shared_directory>` empty while performing an offline recovery while no additional files from the source system are needed.
6. When the software provisioning manager stops for database restore, copy all saved files to the target System.

Make sure that you also copy either the source `spfile<DBSID>.ora` file - which must contain parameters and not only the entry `spfile=...` - or the source `spfile<DBSID>.ora` file.

5.1.2 Using a CONTROL.SQL File Created by the ORABRCOPY Tool

Related Information

[Generating the Control File Structure \[page 100\]](#)

[Preparing the Target System \(Oracle\) \[page 104\]](#)

[Restoring the Database Files on the Target System \[page 105\]](#)

[Restoring the Database Files on the Target System with BR*Tools \[page 107\]](#)

5.1.2.1 Generating the Control File Structure

Use

The `OraBRCopy` Java tool writes a file `CONTROL.SQL` to the current working directory, which can be used without further adaptations on the target system.

For more information about command line options and output files of the `OraBRCopy` tool, see [Additional Information about the OraBRCopy Tool \[page 219\]](#).

Prerequisites

→ Recommendation

We recommend that you shut down the SAP system before you perform the following steps. The database must still be running.

Procedure

1. Create an installation directory `<INSTDIR>` with permissions `777` on the source system.
2. Copy the `ORABRCOPY.SAR` archive from the directory to which you unpacked the `SWPM10SP<Support_Package_Number>_<Version_Number>.SAR` file and extract it using `SAPCAR`. You can find the archive in the following directory:
`<Path_To_Unpack_Directory>/COMMON/INSTALL/ORA/ORABRCOPY.SAR`
3. Make sure that all redo log groups are archived
4. Start the `OraBRCopy` tool as an OS user with Oracle DBA privileges:
 - `user ora<dbsid>`
 - `user <sapsid>adm`
5. Execute the `ora_br_copy.sh` script in one of the following ways:
 - If you perform an **offline** manual copy, enter the following commands:
`./ora_br_copy.sh -generateFiles -forceLogSwitches -targetSid <TARGET_DBSID> -password <system_password> -listenerPort <listener_port>`
The tool creates the files `CONTROL.SQL`, `CONTROL.TRC` and `init<targetSID>.ora` in your installation directory, shuts down and restarts the database and performs the required log switches.
 - If you perform an **offline or online** backup using BR*Tools, enter the following commands:
`./ora_br_copy.sh -generateFiles -targetSid <TARGET_DBSID> -password <system_password> -listenerPort <listener_port>`

i Note

During the online backup, the database must be up and running. To ensure this, this command must not contain the parameter `-forceLogSwitches`.

The tool creates the files `CONTROL.SQL`, `CONTROL.TRC` and `init<targetSID>.ora` in your installation directory, and performs the required log switches.

Note

If an error occurs, check the log file:

`<INSTDIR>/ora.brcopy.log`

6. Verify and, if necessary, update the `CONTROL.SQL` control file using the `CONTROL.TRC` trace file as follows.

Example

In the following example, entries of `CONTROL.SQL` written in bold should be compared and changed according to the trace file:

```
REM
=====
REM CONTROL.SQL
REM
REM SAP AG Walldorf
REM Systeme, Anwendungen und Produkte in der Datenverarbeitung
REM
REM (C) Copyright SAP AG 2004
REM
=====
REM Generated at:
REM Fri Sep 17 08:33:25 CEST 2005
REM for target system NEW
REM on
REM Windows 2000 5.0 x86
CONNECT / AS SYSDBA
STARTUP NOMOUNT
CREATE CONTROLFILE REUSE
SET DATABASE "NEW"
RESETLOGS
ARCHIVELOG
MAXLOGFILES 255
MAXLOGMEMBERS 3
MAXDATAFILES 1022
```

```

MAXINSTANCES 50

MAXLOGHISTORY 1134

LOGFILE

GROUP 1 (
  '/oracle/NEW/origlogA/log_g11m1.dbf',
  '/oracle/NEW/mirrlogA/log_g11m2.dbf'
) SIZE 50M,

GROUP 2 (
  '/oracle/NEW/origlogB/log_g12m1.dbf',
  '/oracle/NEW/mirrlogB/log_g12m2.dbf'
) SIZE 50M,

GROUP 3 (
  '/oracle/NEW/origlogA/log_g13m1.dbf',
  '/oracle/NEW/mirrlogA/log_g13m2.dbf'
) SIZE 50M,

GROUP 4 (
  '/oracle/NEW/origlogB/log_g14m1.dbf',
  '/oracle/NEW/mirrlogB/log_g14m2.dbf'
) SIZE 50M

DATAFILE

'/oracle/NEW/sapdata1/system_1/system.data1',
'/oracle/NEW/sapdata3/ims_1/ims.data1',
'/oracle/NEW/sapdata3/ims_2/ims.data2',
'/oracle/NEW/sapdata3/ims_3/ims.data3',
'/oracle/NEW/sapdata3/ims_4/ims.data4',
'/oracle/NEW/sapdata4/ims_5/ims.data5',
'/oracle/NEW/sapdata4/ims_6/ims.data6',
'/oracle/NEW/sapdata4/ims_7/ims.data7',
'/oracle/NEW/sapdata4/ims_8/ims.data8',
'/oracle/NEW/sapdata4/ims_9/ims.data9',
'/oracle/NEW/sapdata1/ims700_1/ims700.data1',
'/oracle/NEW/sapdata1/ims700_2/ims700.data2',
'/oracle/NEW/sapdata1/ims700_3/ims700.data3',

```

```

'/oracle/NEW/sapdata1/ims700_4/ims700.data4',
'/oracle/NEW/sapdata2/ims700_5/ims700.data5',
'/oracle/NEW/sapdata2/ims700_6/ims700.data6',
'/oracle/NEW/sapdata2/ims700_7/ims700.data7',
'/oracle/NEW/sapdata2/ims700_8/ims700.data8',
'/oracle/NEW/sapdata2/ims700_9/ims700.data9',
'/oracle/NEW/sapdata3/ims700_10/ims700.data10',
'/oracle/NEW/sapdata4/ims700_11/ims700.data11',
'/oracle/NEW/sapdata1/imsUSR_1/imsUSR.data1',
'/oracle/NEW/sapdata2/roll_1/roll.data1'
;

ALTER DATABASE OPEN RESETLOGS;

ALTER TABLESPACE PSAPTEMP ADD TEMPFILE
'/oracle/NEW/sapdata3/temp_1/temp.data1'
SIZE 350M REUSE AUTOEXTEND OFF;

```

Note

In the above example, entries and values of CONTROL .SQL written in bold should be compared to the trace file.

Changes to be made

1. If you want to migrate your database from 32-bit to 64-bit or vice versa, add the following lines at the bottom of the CONTROL .SQL file:

```

shutdown immediate
startup upgrade
spool utlirp.log
@?/rdbms/admin/utlirp.sql
spool off
shutdown immediate
startup
spool utlrp.log
@?/rdbms/admin/utlrp.sql
spool off
exit

```
2. **MAXLOGFILES** 255

...

The numbers must be greater than or equal to the corresponding numbers in the trace file.
3. GROUP 1 (

```

'/oracle/NEW/origlogA/LOG_G11M1.DBF' ,
'/oracle/NEW/MIRRL0GA/LOG_G11M2.DBF'
) SIZE 50M,
Group 2 (

```

...

The sizes of the respective groups must be equal to the sizes of the corresponding groups in the trace file.

4. `' /oracle/NEW/sapdata1/SYSTEM_1/SYSTEM.DATA1 ',`
`' /oracle/NEW/sapdata3/ims_1/ims.DATA1 ',`

...

`' /oracle/NEW/sapdata1/ims700_1/ims700.DATA1 '`

...

The count of the data files must be equal to the count of the corresponding data files in the trace file.

5. `ALTER TABLESPACE PSAPTEMP ADD TEMPFILE`
`' /oracle/NEW/sapdata3/temp_1/temp.DATA1 '`
`SIZE 350M REUSE AUTOEXTEND OFF;`

...

The size must be equal to the corresponding size in the trace file.

6. The number of rows with `ALTER TABLESPACE` must be equal to the number of corresponding rows in the trace file.

5.1.2.2 Preparing the Target System (Oracle)

This section describes how to prepare the target system for Oracle-specific system copy.

Prerequisites








Make sure that `sapdata<n>` file systems on the target system host are large enough.

Procedure

1. Install the target SAP system with the software provisioning manager as described in the installation documentation for your SAP solution.

Caution

When you perform a system copy with the Oracle backup/restore method, you **cannot** change the database schema and the tablespace names of the new target system. When installing the target primary application server instance, the target database instance, or the target additional application server instance make sure that you enter the correct database schema names (which are the database schema names of the **source** system). The schema names of the source and target system must be identical.

- a. On the *Welcome* screen, choose  `<Your Product>`  `<Your Database>`  *System Copy*  *Target System*  `<System Variant>`  `<Technical Stack>` .
- b. When the software provisioning manager prompts for the database copy method, choose *Homogeneous System Copy (Backup/Restore)*.

- c. Proceed until the software provisioning manager stops to restore the database files on the target system.

The following message is displayed:

SAPinst now stops the installation. Proceed as follows:...

2. If necessary, extract the Oracle stage archives manually and install the Oracle software as described in the installation documentation for your SAP solution.
3. Restore the database files on the target system.
4. If they do not exist, create the following directories on the target system:

- /oracle/<TARGET_DBSID>/mirrlog<x>
- /oracle/<TARGET_DBSID>/origlog<x>
- /oracle/<TARGET_DBSID>/sapdata<x>
- /oracle/<TARGET_DBSID>/sapreorg
- /oracle/<TARGET_DBSID>/saparch
- /oracle/<TARGET_DBSID>/oraarch
- /oracle/<TARGET_DBSID>/saptrace
- /oracle/<TARGET_DBSID>/saptrace/background
- /oracle/<TARGET_DBSID>/saptrace/usertrace
- /oracle/<TARGET_DBSID>/origlogA/cntrl
- /oracle/<TARGET_DBSID>/sapdata1/cntrl
- /oracle/<TARGET_DBSID>/saparch/cntrl
- /oracle/<TARGET_DBSID>/sapcheck
- If **Oracle TDE** is enabled, make sure that you also copy the Oracle wallet key file to the target system. The wallet file is located under /oracle/<DBSID>/orawallet/tde/*.

5. Make sure that the following directories are empty (except the subdirectory saparch/cntrl):

- /oracle/<TARGET_DBSID>/saparch
- /oracle/<TARGET_DBSID>/oraarch

6. All directories must be owned by the software owner oracle:oinstall (default for Oracle 12c) of the target database or ora<target_dbsid>:dba (default for Oracle 11g).

To do this, enter the following command:

Oracle 12c: `chown -R oracle:oinstall <directory>`

Oracle 11g: `chown -R ora<target_dbsid>:dba <directory>`

5.1.2.3 Restoring the Database Files on the Target System

Use

⚠ Caution

If you do not use an offline backup but copy the database files directly from the source to the target system host, make sure that you shut down the database on the source system before you copy the listed files from the source to the target directories.

Procedure

1. Copy the following files from the source to the target system host either by using an offline backup or by copying the listed files from the source directories to the target directories.

Directories on UNIX

Source and Target Directory	Files
/oracle/<DBSID>/sapdata<x>	All files
/oracle/<DBSID>/origlog<x>	All files
/oracle/<DBSID>/mirrlog<x>	All files
Source: <INSTDIR> Target: <SAPINST_INSTDIR>	CONTROL.SQL
Source: <INSTDIR> Target: /oracle/<DBSID>/<DB_VERSION>_<BIT>/dbs	init<TARGET_DBSID>.ora

Directories on Windows

Source and Target Directory	Files
<drive>:\oracle\<DBSID>\sapdata<x>	All files
<drive>:\oracle\<DBSID>\origlog<x>	All files
<drive>:\oracle\<DBSID>\mirrlog<x>	All files
Source: <INSTDIR> Target: <SAPINST_INSTDIR>	CONTROL.SQL
Source: <INSTDIR> Target: \oracle\<DBSID>\<DB_VERSION>_<BIT>\database	init<TARGET_DBSID>.ora

2. After you have copied the database files, make sure that the files on the source and target system are not located in different directories or drives. If required, make the corresponding changes in the files control.sql and the init<DBSID>.ora.
3. Verify that the created directories and copied files have the owner ora<target_dbsid>, belong to the group dba, and have the permissions 740.
4. Make sure that the control files are not restored. If necessary, remove them.
The file names are specified by the parameter control_files of the init<TARGET_DBSID>.ora file.

5.1.2.4 Restoring the Database Files on the Target System with BR*Tools

Procedure

1. Copy the following files from the source system host to the target system host by copying manually the listed files from the source directories to the target directories.

Source and Target Directory	Files
Source: <INSTDIR>	CONTROL.SQL
Target: <SAPINST_INSTDIR>	
Source: <INSTDIR>	init<TARGET_DBSID>.ora
Target: /oracle/<DBSID>/<DB_VERSION>_<BIT>/dbs	

2. Call the restore and recovery function of BR*Tools.

If you follow these instructions, the prerequisites are fulfilled. The main prerequisite is that the corresponding BR*Tools logs (BRBACKUP detailed and summary log, BRARCHIVE summary log) are copied from the source to the target system. In addition, the postprocessing steps mentioned in the SAP Note [1003028](#) are covered during the standard system copy procedure.

i Note

If [Oracle TDE \[page 213\]](#) is enabled when using BR recovery, you need to provide your wallet password.

You can specify the wallet password with the BRRECOVER option `-pw <wallet password>`.

Example:

```
brrecover -u / -t reset -b last -f <DB_SID> -pw <wallet password> -c force
```

For more information about the execution of restore and recovery under the control of BRRECOVER and the exact syntax of BRRECOVER, see the section *Homogeneous Database Copy* in SAP Note [1003028](#).

For more information about BR*Tools, see the [SAP Library \[page 24\]](#) 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 \[page 24\]](#), and then continue the navigation as described below.

► [SAP NetWeaver Library: Function-Oriented View](#) ► [Administration of Databases](#) ► [Database Administration for Oracle](#) ► [SAP Database Guide: Oracle BR*Tools for Oracle DBA](#)

3. Shut down the Oracle database instance as follows:

```
sqlplus /nolog  
  
shutdown immediate  
  
exit
```

5.1.3 Creating a Backup

Create a backup if required. Choose between the following possibilities: Performing an offline backup manually or an offline or online backup with BR*Tools.

Related Information

[Creating an Offline Backup \[page 108\]](#)

[Creating an Offline or Online Backup with BR*Tools \[page 108\]](#)

5.1.3.1 Creating an Offline Backup

Create an offline backup, if required. There are different possibilities for preparing the actual transfer of the database files:

- If you have an up-to-date offline backup, you can use it (provided that `redo logs` were cleaned up with forced log switches).
- If you want to transport the database file (for example, on tape) or if you have to perform the database shutdown at a certain time, stop the database (normal shutdown) and perform a complete offline backup. You can use the trace file `CONTROL.TRC` created by `OrabRcOPY` to determine the file system trees that have to be saved.
- Stop the database (normal shutdown) and copy the database files when the actual transfer to the target system takes place. You do not have to perform any preparations for the actual transfer now. Proceed with the next steps.

5.1.3.2 Creating an Offline or Online Backup with BR*Tools

You can use any backup strategy supported by BR*Tools as the basis for a system copy: offline or online, with or without `BACKINT`, with or without `RMAN`, complete or incremental, and so on. The backup strategy must simply be valid for restore and recovery. This means that a complete restore and recovery of the source database must be possible. In addition for `BACKINT` and `RMAN`, the external backup tools must be configured so that a restore is possible on the target host.

Procedure

Proceed as described in the [SAP Library \[page 24\]](#) 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 \[page 24\]](#) , and then continue the navigation as described below.

► [SAP NetWeaver Library: Function-Oriented View](#) ► [Administration of Databases](#) ► [Database Administration for Oracle](#) ► [SAP Database Guide: Oracle](#) ► [BR*Tools for Oracle DBA](#) ► [BR*Tools in Action](#) ► [Backup and Database Copy with BR*Tools](#) ►

5.2 SAP MaxDB-Specific Procedure

In an SAP system environment, you can create a homogeneous copy of an SAP MaxDB database by using the backup and restore method. This method is suitable for creating an exact copy of an existing database. The source of the copy is a complete data backup of your source database.

Prerequisites

- Byte order – little-endian or big-endian
You can use the backup and restore method to copy systems with the same byte order. That is, you can copy a system based on little-endian to another system based on little-endian. You can also copy a system based on big-endian to another system based on big-endian. Check SAP Note [552464](#) to find out which processor and operating system combination uses which byte order.
- Data backup
You perform the **complete** data backup of your source database.
- Recovery tool (manual restore)
Use the SAP MaxDB Database Studio. For more information, see the [SAP Library \[page 24\]](#) at: ►
► [Database Administration](#) ► [Database Administration for SAP MaxDB](#) ► [SAP MaxDB](#) ► [SAP MaxDB Tools](#) ► [SAP MaxDB Database Studio](#) ► [Restoring Databases: Overview](#) ► [Restoring Databases](#) ►
- Database Software
The database software on the target host must have the same version as the software on the source host. The build number of the software version on the target host must be greater than or equal to the version on the source host.
- Size of the data on the target system
The size of the target system must be greater than the used space on the source system. You can find the size of the used pages on the source system as follows:

```
dbmcli -d <database_name> -u <dbm_user>,<password> -n <database_server> -u SQL  
sap<sid>,<password> sql_execute 'SELECT USEDPERM FROM SERVERDBSTATISTICS'
```

The result of this query is the amount of used space, expressed as the number of 8 KB pages. To get the used space in MB, divide this value by 128. When the software provisioning manager prompts you, configure the database data volumes according to this value.

Context

The software provisioning manager is used for installation on the target system host as described in the installation documentation for your SAP solution at <http://support.sap.com/sltoolset> > > > [System Provisioning](#) > [Installation Option](#) >. In the software provisioning manager, you select the backup and restore method as the database installation method.

This description is **not** valid for the liveCache system copy.

⚠ Caution

Make sure that you know the password of the database system administrator (SUPERDBA) from the source system **before** you start the procedure below. Otherwise, you cannot access the database contents on the target system.

You must also know the name of the SQL database schema on the source system, SAP<SAPSID> – for example, SAPR3.

You can perform this procedure in the following ways:

- **Manual restore**
The software provisioning manager stops before the database instance initialization and asks you to perform the restore on the target database. After you have performed restore and post-restore activities, you can continue the installation in the software provisioning manager.
- **Automatic restore**
The software provisioning manager performs the restore to import the data into the target system. In this scenario, you have to use a single file as the backup medium for the whole backup. The restore can use any SAP MaxDB backup, as long as it is a **single** file.

i Note

The minimum size of the database is calculated from the size of the backup file.

Advantages

- You can use existing offline backups.
- This method is faster than the [database-independent method using R3load](#) [page 51].

Disadvantage

You can only copy between systems with the **same** byte order.

Perform the following steps on the target system:

Procedure

1. To import the target system, start the software provisioning manager as follows and then follow the prompts:

► <Product> ► <Database> ► *System Copy* ► *Target System* ► <System Variant> ► <Technical Stack> ►

2. When the software provisioning manager prompts for the database copy method, choose *Homogeneous System Copy*.
3. In the *MaxDB Backup Template* screen, choose one of the following, *Manual Restore*, or *Restore by Software Provisioning Manager*:

- *Manual restore*

In the execution phase, you are prompted to do the following:

Follow the restore procedure as described in the [SAP Library \[page 24\]](#) at: ► ► *Database*

Administration ► *Database Administration for SAP MaxDB* ► *SAP MaxDB* ► *SAP MaxDB Tools* ► *SAP MaxDB Database Studio* ► *Restoring Databases: Overview* ► *Restoring Databases* ►

- *Restore by the software provisioning manager*

Enter the following information:

- *Template name*
- *Device/file*

4. After installation is completed, maintain the database connection for CCMS.

For more information, see SAP Note [588515](#) 📄.

5.3 IBM Db2 for Linux, UNIX, and Windows-Specific Procedures

The database-specific procedure for the creation of a system copy is based on a restore of an existing online or offline backup. Therefore, this method is also referred to as *backup/restore procedure*. Since you can use a Db2 backup cross-platform within certain limitations (see below), this method is not limited to the homogenous system copy only.


i Note

This backup/restore procedure described here only works using the software provisioning manager. System copy using native Db2 backup/restore procedures **without** the software provisioning manager are **not** supported for SAP systems.

Prerequisites

- It must be possible to restore the backup of the source system on the platform of the target system.

i Note

For more information about cross-platform backups, also see *Backup and restore operations between different operating systems and hardware platforms* in the IBM Db2 Information Center at <https://publib.boulder.ibm.com/infocenter/db2luw/v9r7/index.jsp?topic=/com.ibm.db2.luw.admin.ha.doc/doc/c0005960.html> .

- If errors occur when restoring the backup on the target system, the complete restore must be repeated.
- If you restore from an encrypted Db2 database backup, you need to make sure that your Db2 instance is set up for encryption in order to access the data from the backup image. The software provisioning manager will configure the Db2 instance for encryption and create a keystore file in which you must provide the master key of the backup. For details, see the procedure below.

Context

i Note

You can also create an SAP system copy with a Db2 database if more advanced techniques like file system snapshots are available. The necessary procedure in this case is called *database relocation*. The database relocation procedure differs significantly from the backup/restore procedure and is **not** described in this guide.

For more information, see the *Database Administration Guide: SAP on IBM Db2 for Linux, UNIX, and Windows*, section *db2inidb Option: as snapshot*.

The software provisioning manager is used for the installation on the target system host as described in the installation documentation for your SAP component. Before you start the software provisioning manager on the target system make sure that all prerequisites for the SAP system installation are met. Especially, make sure that the relevant file systems are available. For more information, see the [installation guide \[page 24\]](#).

In the ABAP system, only the software provisioning manager steps for setting up and loading the database are replaced by a database restore.

Advantages of the Backup Method

- You can use existing online and offline backups.
- Using the backup method is faster than the [database-independent method \[page 51\]](#).


Disadvantages of the Backup Method

- You cannot change the name of the database schema. The name of the database schema is the same as that of the source system. However, you can change the name of the connect user during the *Define Parameters* phase of the target system installation.
- You cannot copy an individual MCOB component to another system. You can only copy the complete system.

Procedure

1. You perform an online or offline backup.

If you use an online backup to copy your system, a roll forward of your database is required after the database restore on the target system. As a prerequisite, the respective database logs must be accessible. We, therefore, recommend that you include the necessary log files in the backup image. Logs are included in the online backup image as long as the option `EXCLUDE LOGS` is not specified.

2. To create a target system, run the software provisioning manager on the target system host by choosing the following on the *Welcome* screen:  `<Product>` `>` `<Database>` `>` `System Copy` `>` `Target System` `>` `<System_Variant>` `>` `<Technical_Stack>` `>`

Perform the installation options in the given sequence and follow the instructions on the software provisioning manager dialogs. When the software provisioning manager prompts for the database copy method, choose *Homogeneous System Copy*.

Note


If you restore from an encrypted database or you want to encrypt your new database from an unencrypted backup, you must select *Use Db2 native encryption* in the *Define Parameters* phase. The Db2 instance will be configured to allow usage of Db2 native encryption, and a keystore file and a new master key will be created.

Caution

Be aware of the following constraints when using the backup method for a homogeneous system copy:

- You cannot change the name of the database schema, during the dialog phase make sure that you enter the database schema exactly as on your source system.
- The tablespace names remain the same during the database restore. However, you can change them after the installation.
- If you want to change the name or the location of the Db2 container on the target system, you have to adapt the Db2 container paths or names in the redirected restore script and then perform a redirected restore. For more information, see the documentation *Database Administration Guide: SAP on IBM Db2 for Linux, UNIX, and Windows*, section *Usage of Tool brdb6brt*.

3. Multi-Partition Database Environments only: Add database partitions

If you copy a system with multiple database partitions, the target system must have the same number of partitions as the source system. For more information, see *Setting up partitioned database environments* in the IBM Db2 Information Center at: <http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/index.jsp?topic=/com.ibm.db2.luw.qb.server.doc/doc/t0023605.html> 

4. If you restore from an encrypted backup image, you must provide the master key used with the backup image.
 - a. Log on as `db2<dbsid>` to your database host.
 - b. Run the following command:

```
setenv PATH ${PATH}:/db2/db2<dbsid>/sqllib/gskit/bin
```

- c. Depending on your platform, run the following:

```
AIX: setenv LIBPATH ${LIBPATH}:/db2/db2<dbsid>/sqllib/lib64/gskit
```

```
HP: setenv SHLIB_PATH ${SHLIB_PATH}:/db2/db2<dbsid>/sqllib/lib64/gskit
```

Linux and Solaris: `setenv LD_LIBRARY_PATH ${LD_LIBRARY_PATH}:/db2/db2<dbsid>/sqllib/lib64/gskit`

- d. Import the master key from your source system. Make sure the file permissions allow access to the source keystore file. You can choose to import all master keys from the source system or only the one used with the backup image by adding `-label <labelname>` to the following command:

```
gsk8capicmd_64 -cert -import -db <source_keystorefile>.p12 -target /db2/db2<dbsid>/keystore/sapdb2<dbsid>_db_encr.p12
```

- e. Make sure that you add encryption options to your restore command.

- If your target database is encrypted, insert the following:
`encrypt cipher <cipher type> key length <key_length> master key label sap_db2<dbsid>_<hostname>_dbencr_000`
where `<cipher type>` is either **AES** or **3DES**

→ Recommendation

We recommend that you use the master key label of your target system. This was generated by the software provisioning manager before the exit step.

- If your target database is unencrypted, insert the following:
`no encrypt`

For more information, see the IBM documentation for the database restore command.

5. Restore your database.

To restore your database, you can choose between one of the following options:

- Simple database restore
To perform a database restore, use the Db2 **RESTORE** command. For more information, see the IBM manual [Db2 Command Reference](#).

i Note

With a simple restore, you can neither change the name nor the location of Db2 containers.

- Redirected restore
This is the recommended method.
A redirected restore allows you to change the name or the location of the Db2 container. To perform a redirected restore, you use the Db2 **RESTORE DATABASE** command with the **REDIRECT GENERATE SCRIPT** option. For more information, see *RESTORE DATABASE command* in the IBM Db2 Information Center at:
<http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/index.jsp?topic=/com.ibm.db2.luw.admin.cmd.doc/doc/r0001976.html> .
Alternatively, you can use the tool `brdb6brt` that retrieves a database backup and creates a CLP script to restore this backup image. Since `brdb6brt` needs to connect to the source system, the source system must be available. For more information about how to use the tool `brdb6brt`, see *Redirected Restore Using brdb6brt* in the *Database Administration Guide: SAP on IBM Db2 for Linux, UNIX, and Windows*.

If you have used an online backup, you have to make sure that you have access to the log files that were created during the online backup. You also have to perform a rollforward operation to bring the database into a consistent state.

If you have chosen to use Db2 native encryption for your target database, verify that your restored database is encrypted by checking the database configuration with `db2 get db config for <DBSID>` and search for “Encrypted database = YES” in the output.

You can now continue with the installation.

Next Steps

After the installation on the target system, do the following:

- To adhere to the SAP standard naming conventions for tablespaces, we recommend that you consider renaming the tablespaces after the installation to reflect the new system name. Each tablespace must be renamed individually. To rename a tablespace, enter the following command:

```
db2 rename tablespace <old_name> to <new_name>
```

❖ Example

```
db2 rename tablespace <SAPSID_SOURCE>#DIMD to <SAPSID_TARGET>#DIMD
```

If you use the **deferred table creation** function and you renamed your tablespaces, you also have to execute the following command using the `db6util` tool:

```
db6util -rtvt <SAPSID_SOURCE>## <SAPSID_TARGET>##
```

For more information, see SAP Note [1227165](#).

⚠ Caution

Make sure that you use an up-to-date version of the `db6util` tool. You require at least a version that supports the option `-rtvt`. To check the command options of the `db6util` tool, enter the following command:

```
db6util -h
```

In addition, you have to update the `tablespace` names in tables `TSDB6`, `IADB6`, and `TADB6`. To rename all tablespaces in the respective tables according to the standard naming conventions, use the following commands:

- For table `TSDB6`, enter the following SQL command:

```
update <source_database_schema>.tsdb6 set tablespace = '<SAPSID_TARGET>#' ||  
substr(tablespace,5,length(tablespace)-4),indspace='<SAPSID_TARGET>#' ||  
substr(indspace,5,length(indspace)-4)
```
- For table `IADB6`, enter the following SQL command:

```
update <source_database_schema>.iadb6 set tablespace = '<SAPSID_TARGET>#' ||  
substr(tablespace,5,length(tablespace)-4)
```
- For table `TADB6`, enter the following SQL command:

```
update <source_database_schema>.tabdb6 set tablespace = '<SAPSID_TARGET>#' ||  
substr(tablespace,5,length(tablespace)-4)
```
- If you performed a redirected restore, check all settings of the database manager and database configuration parameters. Specifically, make sure that the following configuration parameters point to the correct path:
 - `DIAGPATH` (DBM)

- DFTDBPATH (DBM)
- Path to log files (DB)
- If set, NEWLOGPATH (DB), OVERFLOWLOGPATH (DB), FAILARCHPATH (DB) and MIRRORLOGPATH (DB)

More Information

- *Database Administration Guide: SAP on IBM Db2 for Linux, UNIX, and Windows* available at https://help.sap.com/viewer/db6_admin.
- IBM Knowledge Center at <https://www.ibm.com/support/knowledgecenter/SSEPGG> ➡
- IBM Db2 manuals at <http://www-01.ibm.com/support/docview.wss?uid=swg27023558> ➡

5.4 IBM Db2 for z/OS Specific Procedures

In an SAP system environment, you can create a homogeneous system copy of a DB2 database using the offline system copy method.

Prerequisites

The following prerequisites must be fulfilled to use this method:

- The permissions of the source and target systems must be completely separate. The source system must not be able to use the resources of the target system, and the target system must not be able to use the resources of the source system.
- RACF authorization for the target DB2 subsystem is complete.
- Source and target systems must work with DB2 managed objects.
- Procedures of the source and the target system are defined in the DB2 PROCLIB.
- Source and target systems have appropriate entries in the APF list.
- Volumes of the source and target systems are managed by SMS.
- At first source and target systems run with the same DB2 service level. After copying the source system to a target system, you can migrate or upgrade both systems to a higher service level.

Context

This document assumes that the database schema of your SAP system is `SAPR3`. If you employ a different schema, adapt the references to `SAPR3` in the following SQL statements and jobs to reflect the actual schema name.

The following section describes an **offline system copy method** for SAP systems on IBM Db2 for z/OS.

Advantage of the Offline System Copy Method

This method is faster than the [database-independent method](#) [page 51].

Restriction of the Offline System Copy Method

At the moment, you cannot copy an individual MCODE component to another system. You can only copy the complete system.

i Note

The offline system copy must be performed by an experienced database administrator.

You can find an adapted procedure for an **online system copy** in the IBM documentation *High Availability for SAP on zSeries Using Autonomic Computing Technologies*.

Process Flow of the Main Steps in this Procedure

The following sections contain the detailed steps involved in the homogeneous system copy procedure for Db2 for z/OS.

The offline system copy can be divided into the following steps:

Procedure

1. [Step 1: Check the Source System and Stop it after Successful Check \[page 117\]](#)
2. [Step 2: Consider DB2 Procedures of the Target System \[page 119\]](#)
3. [Step 3: Delete All Obsolete Objects of the Target System \[page 119\]](#)
4. [Step 4: Copy All Objects of the Source System into the Target System \[page 119\]](#)
5. [Step 5: Add All DB2 Subsystem Libraries to a PARMLIB Containing Definitions Required for APF \[page 120\]](#)
6. [Step 6: Alter the BSDS of the Target System \[page 120\]](#)
7. [Step 7: Change Entries of logcopy Data Sets in the BSDS of the Target System \[page 120\]](#)
8. [Step 8: Customize DB2 Modules Using DSNTIJUZ \[page 120\]](#)
9. [Step 9: Configure the Distributed Data Facility \(DDF\) \[page 121\]](#)
10. [Step 10: Start the Target System Using ACCESS\(MAINT\) \[page 121\]](#)
11. [Step 11: Update the DB2 Catalog Using CATMAINT UPDATE VCAT SWITCH \[page 121\]](#)
12. [Step 12: Stop and Restart the Target System \[page 121\]](#)
13. [Step 13: Create DSNTDP2 and DSNTDP4 Load Modules for the Target System \[page 122\]](#)
14. [Step 14: Alter All WLM Environments of Stored Procedures \[page 122\]](#)
15. [Step 15: Perform Post-Offline System Copy Actions \(Optional\) \[page 122\]](#)

5.4.1 Step 1: Check the Source System and Stop it after Successful Check

Procedure

1. Check the source system for active threads using the following DB2 command: **DIS THD(*)**

If there are active threads, stop all applications running against the source system.

2. Check the source system for authorized utilities using the following DB2 command: `DIS UTIL(*)`

The command shows the status of all utility jobs known to DB2. You should get the following message: NO AUTHORIZED UTILITY FOUND FOR UTILID = *

If there are utilities, wait for their successful completion or terminate them.

3. Ensure that all DB2 objects of the source system are started in RW mode.

You can check this using the following DB2 command: `DISPLAY DATABASE(*) SPACENAM(*) RES`

The command displays all databases, table spaces, or indexes in a restricted status.

You should get the following message: NO DATABASES FOUND

In all other cases do not proceed. We recommend that you repair all databases, table spaces, or indexes identified as restricted. For more information, see the command reference of Db2 for z/OS.

4. The source system must be stopped and restarted now in `ACCESS(MAINT)`.

`ACCESS(MAINT)` prohibits access to any authorization IDs other than `SYSADM`, `SYSOPR` and `SECADM`.

5. Later in this workflow all `WLM ENVIRONMENTS` of DB2 procedures must be altered in the target system. Identify all created procedures and `WLM ENVIRONMENTS` with the following SQL statement:

```
SELECT 'ALTER PROCEDURE ' CONCAT
      SCHEMA CONCAT '.' CONCAT NAME CONCAT ' '
      CONCAT ' WLM ENVIRONMENT '
      CONCAT STRIP(WLM_ENVIRONMENT) CONCAT ';'
  FROM SYSIBM.SYSROUTINES
 WHERE ROUTINETYPE='P';

SELECT 'ALTER SPECIFIC FUNCTION ' CONCAT
      SCHEMA CONCAT '.' CONCAT SPECIFICNAME CONCAT ' '
      CONCAT ' WLM ENVIRONMENT '
      CONCAT STRIP(WLM_ENVIRONMENT) CONCAT ';'
  FROM SYSIBM.SYSROUTINES
 WHERE ROUTINETYPE='F'
    AND FENCED = 'Y';
```

The result of this query should look like the following:

i Note

This is only an excerpt from the result.

```
ALTER PROCEDURE DSNADM."ADMIN_TASK_LIST" WLM ENVIRONMENT D990_GENERAL;
ALTER PROCEDURE DSNADM."ADMIN_TASK_OUTPUT" WLM ENVIRONMENT D990_GENERAL;
ALTER PROCEDURE DSNADM."ADMIN_TASK_STATUS" WLM ENVIRONMENT D990_GENERAL;
ALTER PROCEDURE DSNADM."ADMIN_TASK_STATUS" WLM ENVIRONMENT D990_GENERAL;
ALTER PROCEDURE SYSPROC."DSNACICS" WLM ENVIRONMENT D128_GENERAL;
```

Keep the results of this query in a safe place.

6. Stop the source system again.
7. After the source system has completely terminated, print the contents of all source system boot strap datasets using utility `DSNJU004`.

Carefully save the output. The values of `START RBA` and `END RBA` of all logcopy datasets are needed later in this workflow.

⚠ Caution

Do not start the source system until all objects (`boot strap datasets`, `LOGCOPY`, `VSAM` clusters and so on) are copied into the target system. Otherwise the target system might be highly inconsistent. Therefore it is strongly recommended to prevent the source system from being started until [step 4 \[page 119\]](#) of this process flow has been completed successfully.

5.4.2 Step 2: Consider DB2 Procedures of the Target System

Consider the following cases:

- Homogeneous system copy of the source system is provided in an existing target system. In this case you can skip step 2.
- Homogeneous system copy of the source system is provided in a nonexistent target system. In this case customize and run a private copy of `DSNTIIMV` to update the `DB2 PROCLIB`.

5.4.3 Step 3: Delete All Obsolete Objects of the Target System

Consider the following cases:

- Homogeneous system copy of the source system is provided in a target system that already exists. In this case delete all obsolete bootstrap datasets, logcopy datasets, archives, `VSAM` clusters. Ensure that all obsolete objects of the target system are deleted.
- Homogeneous system copy of the source system is provided in a non-existing target system. In this case you can skip step 3. All necessary datasets are copied from the source system in [step 4 \[page 119\]](#) of this process flow.

5.4.4 Step 4: Copy All Objects of the Source System into the Target System

1. Ensure that the source system is still stopped. Otherwise `boot strap datasets`, `logcopy datasets`, `VSAM` clusters are allocated by the source system and cannot be copied.
2. Customize and run a job using, for example, program `ADRDSSU`. Use **`ADRSSU` parameter `RENUNC`** to rename all objects to reflect the high-level qualifiers of the target system.
3. Now you can restart the source system without any risk of inconsistency in the target system.

5.4.5 Step 5: Add All DB2 Subsystem Libraries to a PARMLIB Containing Definitions Required for APF

Consider the following cases:

- The target system was already up and running in the past, so that all definitions required for authorized program facility (APF) already exist.
In this case you can skip step 5.
- The target system was never up and running.
In this case add all definitions required for APF to an appropriate PARMLIB and set APF. Otherwise the target system cannot be started.

5.4.6 Step 6: Alter the BSDS of the Target System

Change VSAMCAT in the bootstrap data sets (BSDS) of the target system. Use the DSNJU003 utility in DB2 with parameter NEWCAT VSAMCAT to reflect the new VSAMCAT high-level qualifier.

Repeat this step for each data sharing member BSDS of data sharing systems, .

5.4.7 Step 7: Change Entries of logcopy Data Sets in the BSDS of the Target System

Use DB2 utility DSNJU003 to delete obsolete and invalid DSNNAME entries using the DELETE DSNNAME parameter. In the same job you can define the name of the new logcopy data sets with the NEWLOG DSNNAME parameter. Carefully customize the STARTRBA and ENDRBA parameters using the values of the source system.

Repeat this step for each data sharing member BSDS of data sharing systems.

5.4.8 Step 8: Customize DB2 Modules Using DSNTIJUZ

For the target system you have to customize the DB2 data-only load module DSNHMCID, the application defaults load module (DSNHDECP), and the subsystem parameter module using DSNTIJUZ.

At least change the following parameters:

- The name of the libraries identified in STEPLIB, SYSLIB
- SYSLMOD DD statements
- The ADMTPROC parameter, if the administrative task scheduler is used
- The CATALOG parameter
- The FCCOPYDDN parameter
- The IRLMPRC parameter
- The IRLMSID parameter

- The ARCPFX1 and ARCPFX2 parameters, if the target system is to run with archiving.
If the target system is to run without archiving, identified by parameter OFFLOAD=NO, the ARCPFX2 / ARCPFX2 parameters must not be changed. However, for security reasons it is recommended to run the target system with archiving.

Other parameters of the target system can be modified as requested by the owner of the subsystem.

Repeat this step for each data sharing member BSDS of data sharing systems.

5.4.9 Step 9: Configure the Distributed Data Facility (DDF)

Use the DSNJU003 stand-alone utility to change the bootstrap data sets (BSDS). Adjust LOCATION, LUNAME, PORT, and RESPORT considering the new Distributed Data Facility (DDF) environment.

Repeat this step for each data sharing member BSDS of data sharing systems.

5.4.10 Step 10: Start the Target System Using ACCESS(MAINT)

You must be able to start the target system with ACCESS(MAINT), otherwise the CATMAINT utility fails in the [next step \[page 121\]](#) of this process flow.

If the target system does not start successfully, do **not** proceed with [Step 11: Update the DB2 Catalog Using CATMAINT UPDATE VCAT SWITCH \[page 121\]](#).

For data sharing systems, start the first member and continue with [Step 11: Update the DB2 Catalog Using CATMAINT UPDATE VCAT SWITCH \[page 121\]](#).

5.4.11 Step 11: Update the DB2 Catalog Using CATMAINT UPDATE VCAT SWITCH

Use the CATMAINT utility with option VCAT SWITCH to provide the new high-level qualifier of the target system in the DB2 catalog.

For data sharing systems, run this step with the first started member.

5.4.12 Step 12: Stop and Restart the Target System

Stop and restart the target system.

When the target system is restarted, you have to check the SYSLOG carefully for normal completion.

⚠ Caution

Do not proceed with the [next step \[page 122\]](#) if problems occur while the target system is being stopped or restarted.

5.4.13 Step 13: Create DSNTEP2 and DSNTEP4 Load Modules for the Target System

Create, test, and run the DSNTEP2 and DSNTEP4 load modules. To be able to do this, you have to customize and run DSNTEJ1L.

5.4.14 Step 14: Alter All WLM Environments of Stored Procedures

Use

In [step 1 \[page 117\]](#) of this process flow, you ran a query to prepare all ALTER PROCEDURE statements for the target system.

Now you have to customize the result of the query by changing the WLM ENVIRONMENT value for the WLM ENVIRONMENT names of the target system.

Procedure

1. Ensure that the APPLICATION ENVIRONMENT NAMES and the appropriate PROCEDURE NAMES exist in the DB2 PROCLIB and that the APPLICATION ENVIRONMENTS are activated.
2. Run all ALTER PROCEDURE commands in the target system using the DSNTEP2 program.

5.4.15 Step 15: Perform Post-Offline System Copy Actions (Optional)

1. As all GRANTS of the source system are still valid, check them using SPUFI by executing the following command: **SELECT * FROM SYSIBM.SYSUSERAUTH;**
Maintain this table according to your needs.
2. Grant new users or revoke obsolete users.
3. If required, change the user authorizations of the target system.
The IBM Db2 catalog still contains the authorizations of the source system.

5.5 SAP ASE 16.0 Server-Specific Procedure

This section describes how to perform a homogeneous system copy of a SAP ASE 16.0 database by using the `load database dump` method, or the `attach database device` method in an SAP environment. The software provisioning manager supports both methods.

Prerequisites

Before you start the system copy procedure, implement SAP Note [1612437](#) .

Context

The `load database dump` method and the `attach database device` method have the following advantages compared to the R3load method:

- You can use an existing full database dump and optionally also transaction dumps.
- You can copy the complete database software and database devices (all files below `/sybase/<DBSID>`) to the target system and use this copy to create the target system.
- These methods are faster than the [database-independent method \[page 51\]](#).

For more information about system copy with SAP ASE 16.0 as target database, see SAP Note [1697542](#) .

Procedure

1. Provide the database files required for the target system setup using one of the following ways:
 - Suspend write operations to the database devices of the source system database together with the creation of a database manifest file (using SAP ASE 16.0 command `quiesce database <DBSID>_tag hold <DBSID> for external dump to <manifest_file>`), copy all necessary files to the target system, and enable the write operation again (using SAP ASE 16.0 command `quiesce database <DBSID>_tag release`).
 - Create a backup (SAP ASE 16.0 command `dump database`).
2. Copy the files to the target system.
3. Run the software provisioning manager to install the target system by choosing the following on the *Welcome* screen:

► *<Product>* ► *SAP ASE* ► *System Copy* ► *Target System* ► *<System Variant>* ► *Based on <Technical Stack>* ►

i Note

- Choose the installation services in exactly the order they appear. For more information, see the [installation guide \[page 24\]](#) for your SAP NetWeaver-based system on SAP ASE.

- On the software provisioning manager screen *SAP SystemDatabase*, make sure that you select *Homogeneous System Copy (SAP ASE-specific: Attach database device or Load database dump)*.
- The software provisioning manager asks you if you want to use either an already existing SAP ASE installation on the target system or the database software from the installation media.
- Depending on the method chosen, you have to enter either the path to the database dump files or the location of the database manifest file. The software provisioning manager tries to find the database devices mentioned in the manifest file automatically, otherwise it asks for the files during the software provisioning manager execution phase.

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 \[page 24\]](#).

[Copying the Primary Application Server Instance Only \[page 126\]](#)

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 \[page 126\]](#)

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 \[page 128\]](#)

With this procedure 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 \[page 129\]](#)

Using the [Refresh Database Content](#) option in the software provisioning manager you can refresh the **content** of an existing database using a database backup without having to copy the primary application server instance, and to reinstall additional applications servers. No new database instance is installed. The sections below describe how to use the [Refresh Database Content](#) option for your database.


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 \[page 68\]](#) .
4. On the *Welcome* screen, navigate to the following folder according to the requirements of your target system:

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` .

Note

For **Oracle Database** you **cannot** use the database-independent method described in the *Procedure* below. Instead, you must use the database specific method (see [Oracle-Specific Procedure \[page 96\]](#)) to copy or restore your database in the target system.

Caution

Use Software Provisioning Manager de-clustering only when you perform a system copy of the entire system. The de-clustering option to remove clusters must **not** be enabled in the system copy export.

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 \[page 94\]](#).

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 \[page 128\]](#) or the procedure described in [Copying the Database Only - Refresh Database Content \[page 129\]](#)

For more information, see <https://blogs.sap.com/2017/03/02/refresh-database-content-without-reinstalling-the-database-or-kernel-for-abap-systems/>

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

- 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.
- On the **target** host, stop all SAP application server instances, but leave the ASCS instance running.
- 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>`.

- When the software provisioning manager has completed the installation of the database, restart your system including all instance services.
- Shut down the old database instance.
- SAP MaxDB only:** Set up the xuser entries from the home directory of the user `<sapsid>adm` on each application server as follows:

```
xuser -U <key> -u <dbuser>,<password> -d <dbsid> -n <dbhost> -S SAPR3 -t 0 -I 0  
set
```

The required keys and dbusers are as follows:

- Key `DEFAULT` with dbuser `SAP<SAPSID>`
- Key `c` with dbuser `control`
- Key `w` with dbuser `superdba`

Related Information

[Running Software Provisioning Manager \[page 68\]](#)

6.3 Copying the Database Only – Refresh Database Instance

With this procedure 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 \[page 24\]](#).
- 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 de-clustering option to remove clusters must **not** be enabled in the system copy export.

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 \[page 126\]](#).

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 \[page 129\]](#)

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.
IBM Db2 for Linux, UNIX, and Windows only: If you receive a message that the schema already exists, you must delete the existing database schema. You can do this in one of the following ways:
 - Automatically while running the *Database Refresh or Move* option by choosing to drop the schema on screen
 - Manually before you run the *Database Refresh or Move* option, as described in [Deleting a Database Schema Manually \[page 209\]](#).

Related Information

[Running Software Provisioning Manager \[page 68\]](#)

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 without having to copy the primary application server instance, and to reinstall additional applications servers. No new database instance is installed. The sections below describe how to use the *Refresh Database Content* option for your database.

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 de-clustering option to remove clusters must **not** be enabled in the system copy export.

→ 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.

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 \[page 126\]](#).

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 \[page 128\]](#)

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

System copy option [Refresh Database Content](#) is currently **not** released for SAP SCM.

[Copying the Database Only - Refresh Database Content on SAP ASE \[page 131\]](#)

Using the [Refresh Database Content](#) option in the software provisioning manager, you can refresh the **content** of an existing database **using a database backup** without having to copy the primary application server instance and to reinstall additional applications servers. No new database instance is installed. The refresh can be done using either **database-specific methods** (only applicable for SAP ASE 16.0) or the **SAP standard method** based on R3load .

[Copying the Database Only - Refresh Database Content on IBM Db2 for Linux, UNIX, and Windows \[page 135\]](#)

Using the [Refresh Database Content](#) option in the software provisioning manager, you can refresh the **content** of an existing database **using a database backup** without having to copy the primary application server instance and to reinstall additional applications servers. No new database instance is installed. You can do the refresh using either database-specific methods or the SAP standard method based on R3load .

[Copying the Database Only - Refresh Database Content on Oracle Database \[page 140\]](#)

Using the [Refresh Database Content](#) option in the software provisioning manager, you can refresh the **content** of an existing database **using a database backup** without having to copy the primary application server instance and to reinstall additional applications servers. No new database instance is installed. You can do the refresh using either database-specific methods (backup/restore) or the SAP standard method based on R3load .

[Copying the Database Only - Refresh Database Content on IBM Db2 for z/OS \[page 142\]](#)

Using the [Refresh Database Content](#) option in the software provisioning manager, you can refresh the **content** of an existing database **using a database backup** without having to copy the primary application server instance and to reinstall additional applications servers. No new database instance is installed. You can do the refresh using either database-specific methods or the SAP standard method based on R3load.


Copying the Database Only - Refresh Database Content on SAP MaxDB [page 144]

Using the [Refresh Database Content](#) option in the software provisioning manager, you can refresh the **content** of an existing database **using a database backup** without having to copy the primary application server instance and to reinstall additional applications servers. No new database instance is installed. You can do the refresh using either database-specific methods or the SAP standard method based on R3load.

6.4.1 Copying the Database Only - Refresh Database Content on SAP ASE

Using the [Refresh Database Content](#) option in the software provisioning manager, you can refresh the **content** of an existing database **using a database backup** without having to copy the primary application server instance and to reinstall additional applications servers. No new database instance is installed. The refresh can be done using either **database-specific methods** (only applicable for SAP ASE 16.0) or the **SAP standard method** based on R3load.

Prerequisites

- Your SAP system must be based on SAP NetWeaver 7.3 or higher.
- The source system and the target system already exist.
- Prerequisite for using a database-specific method is that source and target database version match. It is not possible to use a target database version that is lower than the source database version. To refresh the content of an existing database you can use database and transaction dumps or a copy of the database device files of the SAP database. For more information about creating database and transaction dumps, and handling of database device files, see the *SAP ASE Administration Guide* at https://help.sap.com/viewer/product/SAP_ASE ►► *Operate* ► *System Administration Guide: Volume 2* ►.
- If the source database is using the full database encryption feature, your target database must use the encryption details of the source system to be able to load and mount the database content. The software provisioning manager prompts for the database encryption details of the source systems. For more information, see SAP Note [2224138](#) .
- Make sure that you have the password for the DDIC user in client 000 of your source system at hand. The software provisioning manager will prompt you for this password during the [Refresh Database Content](#) procedure.


Context

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

SAP ASE 16.0 only: If you want to “move” the database instance to a different host, use the procedure described in [Copying the Database Only – Move Database Instance \[page 126\]](#).

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 \[page 128\]](#)

For more information, see <https://blogs.sap.com/2017/03/02/refresh-database-content-without-reinstalling-the-database-or-kernel-for-abap-systems/> 

Using the SAP Standard Method

1. On the source system, proceed as follows:
 1. Stop the SAP system.
 2. Perform the database instance export as follows:
 1. Start the software provisioning manager on the database host (preferred) or on any other host of the SAP system as described in [Exporting the Source System \[page 65\]](#).
 2. On the *Welcome* screen, run option  **<Product>**  **<Database>**  **System Copy**  **Source System**  **Based on AS ABAP**  **Database Instance Export** 
2. On the target system, proceed as follows:
 1. Stop all SAP application server instances, but leave the ASCS instance and the database instance running
 2. Refresh the database content as follows:
 1. Start the software provisioning manager on the database host as described in [Exporting the Source System \[page 65\]](#).
 2. On the *Welcome* screen, run option  **Generic Options**  **<Database>**  **Refresh Database Content** 

Using the Database-specific Method (Only applicable for SAP ASE 16.0)

i Note

The procedures listed in this section are only applicable for SAP ASE 16.0.

Procedure Using database and transaction dumps

“Database dumps” contain the entire database, including both the data and the transaction log.

“Transactions dumps” contain a record of any database changes made since the last transaction log dump or database dump.

1. On the database host of the source system, create a full database backup.
In the following examples, replace **<SAPSID>** with the name of your SAP System and **<dump_file>** with a full path name of the file to which the database server can write the database content:

1. Open a command shell for OS user **syb<db>sid** and connect to the database server using the following command line: **isql -X -Usapsa -S <SAPSID>**
2. Enter the following commands to create a full database dump:

```
use master
go
dump database <SAPSID> to '<dump_file>'
go
quit
```

3. Enter the following commands to create a transaction dump:

```
use master
go
dump transaction <SAPSID> to '<trans_file>'
go
quit
```

2. On the database host of the target system, proceed as follows:
 1. Stop all SAP application server instances, but leave the ASCS instance and the database instance running
 2. Transfer the database dump file from the database host of the source system to the database host of the target host.
 3. Verify that the OS user **syb<db>sid** is able to read the dump file.
 4. Refresh the database content as follows:
 1. Start the software provisioning manager on the database host as described in [Exporting the Source System \[page 65\]](#).
 2. On the *Welcome* screen, run option **► Generic Options ► <Database> ► Refresh Database Content ►**
 3. When the software provisioning manager asks for the database dump details, enter the location of the database and transaction dump files.
The tool creates the necessary SQL statements to load the database content with that information.
 4. Optionally the database content can be refreshed with a two-step approach if the database dump should be loaded now and transaction files at a later point in time.
 1. Enter the location of the database dump files.
 2. Enable the check box *After loading the database dump, keep the database offline and terminate the Software Provisioning Manager.*
 3. The software provisioning manager will perform the database load and terminate.
 4. The database will be offline and cannot be used at that point in time.
 5. When the last transaction dump is ready, start the software provisioning manager once more.
 6. Enter the location of the transaction files.

7. The software provisioning manager will load the transactions and proceed with the remaining steps of the refresh procedure.

Procedure With Copying of the database device files of the SAP database


1. On the database host of the source system, do the following:

1. Stop the SAP system
2. Create a database manifest file

In the following example, replace **<SAPSID>** with the name of your SAP system and **<manifest_file>** with a full path name of the file to which the database server can write the database manifest:

1. Open a command shell for OS user **syb<dbid>** and connect to the database server using the following command line: **isql -X -Usapsa -S <SAPSID>**
2. Enter the following commands:

```
use master
go
create manifest file
<SAPSID> to '<manifest_file>'
go
quit
```

3. Stop the database server
2. On the database host of the target system, do the following:
 1. Stop all SAP application server instances, but leave the ASCS instance and the database instance running.
 2. Create new folders for the device files (for example like **/sybase/<SAPSID>/sapdata_2** and **/sybase/<SAPSID>/saplog_2**).
 3. Transfer the database device files from the database host of the source system that belong to the SAP database (normally the files in folder **/sybase/<SAPSID>/sapdata_1** and **/sybase/<SAPSID>/saplog_1**) to the newly created **sapdata** and **saplog** folders.
 4. Also transfer the manifest file created on the source system to target system.
 5. Verify that the OS user **syb<dbid>** is able to read both the database device files and the manifest file.
 6. Refresh the database content as follows:
 1. Start the software provisioning manager on the database host as described in [Exporting the Source System \[page 65\]](#).
 2. On the *Welcome* screen, run option **Generic Options** > **<Database>** > **Refresh Database Content** 

Next Steps

Perform the follow-up activities for system copy.

For more information, see [Follow-Up Activities \[page 155\]](#).

Related Information

[Running Software Provisioning Manager \[page 68\]](#)

6.4.2 Copying the Database Only - Refresh Database Content on IBM Db2 for Linux, UNIX, and Windows

Using the [Refresh Database Content](#) option in the software provisioning manager, you can refresh the **content** of an existing database **using a database backup** without having to copy the primary application server instance and to reinstall additional applications servers. No new database instance is installed. You can do the refresh using either database-specific methods or the SAP standard method based on `R31load`.

Prerequisites

- The source system and the target system already exist.
- For the database-specific method, you can use either an online or an offline backup of the database. The following restrictions apply:
 - Source and target database versions must match.
 - This backup must be written to disk if you want the software provisioning manager to refresh the content automatically (the default mode).
 - The database version must be 10.1 or higher.
 - The database must only use automatic storage for its tablespaces.
 - Database setups with multiple servers cannot use the database-specific method. This includes:
 - Partitioned databases using the DB2 Database Partitioning Feature (DPF)
 - IBM Db2 databases using the Db2 pureScale Feature
 - IBM Db2 High Availability Disaster Recovery (HADR) setups
- Make sure that you have the password for the DDIC user in client 000 of your source system at hand. The software provisioning manager will prompt you for this password during the [Refresh Database Content](#) procedure.
- If you refresh your database content from an encrypted Db2 database backup, you need to make sure that your Db2 instance is set up for encryption in order to access the data from the backup image. You must provide the master key of the backup in a keystore file. For details, see the procedure below.


Context

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 \[page 126\]](#).

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 \[page 128\]](#)

For more information, see <https://blogs.sap.com/2017/03/02/refresh-database-content-without-reinstalling-the-database-or-kernel-for-abap-systems/> 

Using the SAP Standard Method

1. On the source system, do the following:
 1. Stop the SAP system.
 2. Perform the database instance export as follows:
 1. Start the software provisioning manager on the database host as described in [Exporting the Source System \[page 65\]](#).
 2. On the *Welcome* screen, run option  **<Product>**  **<Database>**  **System Copy**  **Source System**  **Based on AS ABAP**  **Database Instance Export** 
2. On the target system, do the following:
 1. Stop all SAP application server instances but leave the database instance running.
 2. Refresh the database content as follows:
 1. Start the software provisioning manager on the database host as described in [Exporting the Source System \[page 65\]](#).
 2. On the *Welcome* screen, run option  **Generic Options**  **<Database>**  **Refresh Database Content** 

If you receive a message that the schema already exists, you must delete the existing database schema. You can do this in one of the following ways:

 - Automatically while running the [Refresh Database Content](#) option by choosing to drop the schema on screen *IBM Db2 for Linux, UNIX, and Windows - Drop Existing Schemas*
 - Manually before you run the [Refresh Database Content](#) option, as described in [Deleting a Database Schema Manually \[page 209\]](#).

Using the Database-Specific Method

1. On the **source system**, create a backup of your database. You may perform either an online or an offline backup.

This backup must be written to disk if you want the software provisioning manager to automatically refresh the database content from the backup. This is the default mode.

You can also use other backup types. In this case, you must do the restore of the database manually. The software provisioning manager will pause at the appropriate processing step and prompt you to restore the database.


The following examples give details for creating a backup to disk.

In the following examples, replace **<DBSID>** with the name of the database for your SAP System and **<backup_dir>** with a full path name of the directory to which the database server can write the database content. This directory must exist and be empty.

- Using an online backup:
If you choose this option, your SAP system can still be used during the backup.


Note

You can only use this option if your database is running in log retention mode. For more information, see the following documentations:

- *Installation of SAP Systems Based on the Application Server <Stack> of SAP NetWeaver 7.1 to 7.5 on UNIX : IBM Db2 for Linux, UNIX, and Windows* at <https://support.sap.com/sltoolset> 
 > *System Provisioning* > *Installation Option of Software Provisioning Manager* >.
- *Database Administration Guide — SAP on IBM Db2 for Linux, UNIX, and Windows* available at https://help.sap.com/viewer/db6_admin

1. Log onto the database host of your source system as the db2<dbsid> user.
 2. Create a backup directory: **mkdir <backup_dir>**
 3. Run the following command: **db2 backup db <DBSID> online to <backup_dir> compress include logs**
 4. If your database backup is encrypted, retrieve your current master key label. You will need to import the master key to the target database instance in order to restore your target database. In order to retrieve your current master key label and export it, do the following as user db2<dbsid>:
 1. To get the <labelname>, execute the following command:
db2 "SELECT MASTER_KEY_LABEL FROM TABLE(SYSPROC.ADMIN_GET_ENCRYPTION_INFO())"
 2. Then run the following command:
setenv PATH \${PATH}:/db2/db2<dbsid>/sqllib/gskit/bin
 3. Depending on your platform, run the following:
AIX: setenv LIBPATH \${LIBPATH}:/db2/db2<dbsid>/sqllib/lib64/gskit
HP: setenv SHLIB_PATH \${SHLIB_PATH}:/db2/db2<dbsid>/sqllib/lib64/gskit
Linux and Solaris: setenv LD_LIBRARY_PATH \${LD_LIBRARY_PATH}:/db2/db2<dbsid>/sqllib/lib64/gskit
 4. Export the master key with the label <labelname> from your source system with the following command. You can choose to export all master keys from the source system by omitting **-label <labelname>** from the command:
gsk8capicmd_64 -cert -export -db "/db2/db2<dbsid>/keystore/<source_keystore>.p12" -stashed -target <source_master_keyfile>.p12 -target_type pkcs12 -target_pw <strong_password> -label <labelname>
 5. Copy the keystore file <source_master_keyfile>.p12 to the keystore directory in the home directory of your target db2<dbsid> user on your target system.
- Using an offline backup:
 1. Stop the SAP system.
 2. Log onto the database host of your source system as the db2<dbsid> user.
 3. Create a backup directory using the following command: **mkdir <backup_dir>**
 4. If the database server is not running, start it with the following command: **db2start**

5. Run the following command: **db2 backup db <DBSID> to <backup_dir> compress**
6. If your database backup is encrypted, retrieve your current master key label. You will need to import the master key to the target database instance in order to restore your target database. In order to retrieve your current master key label and export it, do the following as user **db2<dbsid>**:
 1. To get the **<labelname>**, execute the following command:
db2 "SELECT MASTER_KEY_LABEL FROM TABLE(SYSPROC.ADMIN_GET_ENCRYPTION_INFO())"
 2. Then run the following command:
setenv PATH \${PATH}:/db2/db2<dbsid>/sqllib/gskit/bin
 3. Depending on your platform, run the following:
AIX: setenv LIBPATH \${LIBPATH}:/db2/db2<dbsid>/sqllib/lib64/gskit
HP: setenv SHLIB_PATH \${SHLIB_PATH}:/db2/db2<dbsid>/sqllib/lib64/gskit
Linux and Solaris: setenv LD_LIBRARY_PATH \${LD_LIBRARY_PATH}:/db2/db2<dbsid>/sqllib/lib64/gskit
 4. Export the master key with the label **<labelname>** from your source system with the following command. You can choose to export all master keys from the source system by omitting **-label <labelname>** from the command:
gsk8capicmd_64 -cert -export -db "/db2/db2<dbsid>/keystore/<source_keystore>.p12" -stashed -target <source_master_keyfile>.p12 -target_type pkcs12 -target_pw <strong_password> -label <labelname>
 5. Copy the keystore file **<source_master_keyfile>.p12** to the keystore directory in the home directory of your target **db2<dbsid>** user on your target system.
2. On the database host of the **target system**, do the following:
 1. Stop all SAP application server instances but leave the database instance running.
 2. Make sure that the backup directory **<backup_dir>** is accessible on the target system and is readable for the **db2<dbsid>** user. This only applies if you want the software provisioning manager to refresh the database content automatically (the default mode).
 3. If your backup image is encrypted, you must provide the master key used with the backup image.
 1. Log on as **db2<dbsid>** to your database host.
 2. Run the following command:
setenv PATH \${PATH}:/db2/db2<dbsid>/sqllib/gskit/bin
 3. Depending on your platform, run the following:
AIX: setenv LIBPATH \${LIBPATH}:/db2/db2<dbsid>/sqllib/lib64/gskit
HP: setenv SHLIB_PATH \${SHLIB_PATH}:/db2/db2<dbsid>/sqllib/lib64/gskit
Linux and Solaris: setenv LD_LIBRARY_PATH \${LD_LIBRARY_PATH}:/db2/db2<dbsid>/sqllib/lib64/gskit
 4. Import the master key from your source system.
 Make sure the file permissions allow access to the copied source keystore file. You can choose to import all master keys from the source system or only the one used with the backup image by adding **-label <labelname>** to the following command:
gsk8capicmd_64 -cert -import -db <source_master_keyfile>.p12 -target /db2/db2<dbsid>/keystore/sapdb2<dbsid>_db_encr.p12 -stashed
 5. Optional: to view all existing master keys and their respective labels, enter the following command:
gsk8capicmd_64 -cert -list -db "/db2/db2<dbsid>/keystore/sapdb2<dbsid>_db_encr.p12" -stashed

4. Refresh the database content as follows:
 1. Start the software provisioning manager on the database host as described in [Exporting the Source System \[page 65\]](#).
 2. On the *Welcome* screen, run option **Generic Options** > **<Database>** > **Refresh Database Content** 

i Note

Note: If you want to restore your database manually, you must choose to run the software provisioning manager in custom mode.

i Note

When you are prompted to enter your connect user and schema information, you must enter the schema of your source system and the connect user of your target system.

3. In the software provisioning manager, enter the master key label of your target system when asked in the *Define Parameters* phase.

i Note

We recommend using the master key label of your target system. The default for a newly installed system is **sap_db2<dbsid>_<hostname>_dbencr_000**. You can use any existing master key label of your target system.

Next Steps

- To adhere to the SAP standard naming conventions for tablespaces, we recommend that you consider renaming the tablespaces after the installation to reflect the new system name. Each tablespace must be renamed individually. To rename a tablespace, enter the following command:


```
db2 rename tablespace <old_name> to <new_name>
```

Example

```
db2 rename tablespace <SAPSID_SOURCE>#DIMD to <SAPSID_TARGET>#DIMD
```

If you use the **deferred table creation** function and you renamed your tablespaces, you also have to execute the following command using the `db6util` tool:

```
db6util -rtvt <SAPSID_SOURCE>## <SAPSID_TARGET>##
```

For more information, see SAP Note [1227165](#) .

Caution

Make sure that you use an up-to-date version of the `db6util` tool. You require at least a version that supports the option **-rtvt**. To check the command options of the `db6util` tool, enter the following command:

```
db6util -h
```

In addition, you have to update the `tablespace` names in tables `TSDB6`, `IADB6`, and `TADB6`. To rename all tablespaces in the respective tables according to the standard naming conventions, use the following commands:

- For table `TSDB6`, enter the following SQL command:

```
update <source_database_schema>.tsdb6 set tablespace = '<SAPSID_TARGET>#' ||  
substr(tablespace,5,length(tablespace)-4),indspace='<SAPSID_TARGET>#' ||  
substr(indspace,5,length(indspace)-4)
```
- For table `IADB6`, enter the following SQL command:

```
update <source_database_schema>.iadb6 set tablespace = '<SAPSID_TARGET>#' ||  
substr(tablespace,5,length(tablespace)-4)
```
- For table `TADB6`, enter the following SQL command:

```
update <source_database_schema>.tabdb6 set tablespace = '<SAPSID_TARGET>#' ||  
substr(tablespace,5,length(tablespace)-4)
```
- Perform the follow-up activities for system copy.
For more information, see [Follow-Up Activities \[page 155\]](#).

Related Information

[Running Software Provisioning Manager \[page 68\]](#)


[Deleting a Database Schema Manually \[page 209\]](#)

[Follow-Up Activities \[page 155\]](#)

6.4.3 Copying the Database Only - Refresh Database Content on Oracle Database

Using the *Refresh Database Content* option in the software provisioning manager, you can refresh the **content** of an existing database **using a database backup** without having to copy the primary application server instance and to reinstall additional applications servers. No new database instance is installed. You can do the refresh using either database-specific methods (backup/restore) or the SAP standard method based on `R3load`.

Prerequisites

- The source system and the target system already exist.
- If you want to use the *Database Backup/Restore Method*, source and target database version must match. It is not possible to use a target database version that is lower than the source database version.
- If you want to use the *Database Backup/Restore Method*, the database schema must be identical in the source and target database.
- If your source system has Oracle Database Vault (DV) enabled, and you want to enable DV on the target system as well, you need the password of user `secadmin` / `c##secadmin` during the [software provisioning manager import procedure \[page 90\]](#). For more information, see SAP Note [2218115](#) .

- If your source system has Oracle TDE, consider the additional information in section [Support of Oracle Transparent Data Encryption \(Oracle TDE\) \[page 213\]](#).
- Make sure that you have the password for the DDIC user in client 000 of your source system at hand. The software provisioning manager will prompt you for this password during the [Refresh Database Content](#) procedure.


Context

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.












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 \[page 126\]](#).

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 \[page 128\]](#)

For more information, see <https://blogs.sap.com/2017/03/02/refresh-database-content-without-reinstalling-the-database-or-kernel-for-abap-systems/> 

Using the SAP Standard Method

1. On the source system, do the following:
 1. Stop the SAP system.
 2. Perform the database instance export as follows:
 1. Start the software provisioning manager on the database host as described in [Exporting the Source System \[page 65\]](#).
 2. On the *Welcome* screen, run option  **<Product>**  **<Database>**  *System Copy*  *Source System*  *Based on AS ABAP*  *Database Instance Export* 
2. On the target system, do the following:
 1. Stop all SAP application server instances.
 2. Refresh the database content as follows:
 1. Start the software provisioning manager on the database host as described in [Exporting the Source System \[page 65\]](#).
 2. On the *Welcome* screen, run option  *Generic Options*  **<Database>**  *Refresh Database Content* 

Using the Database Backup/Restore Method

Follow the procedure for Oracle backup/restore in [Database-Specific System Copy \[page 94\]](#) and the instructions in [Oracle-Specific Procedure \[page 96\]](#).

1. On the source system, do the following:
Create a backup of your database following the procedure Oracle backup/restore in [Database-Specific System Copy \[page 94\]](#) and the instructions in [Oracle-Specific Procedure \[page 96\]](#).
2. On the target system, do the following:
 1. Restore the backup of your database following the procedure Oracle backup/restore in [Database-Specific System Copy \[page 94\]](#) and the instructions in [Oracle-Specific Procedure \[page 96\]](#).
 2. Stop all SAP application server instances.
 3. Refresh the database content as follows:
 1. Start the software provisioning manager on the database host as described in [Exporting the Source System \[page 65\]](#).
 2. On the *Welcome* screen, run option **► Generic Options ► <Database> ► Refresh Database Content ►**

Next Steps

Perform the follow-up activities for system copy.

For more information, see [Follow-Up Activities \[page 155\]](#).

Related Information

[Running Software Provisioning Manager \[page 68\]](#)

[Follow-Up Activities \[page 155\]](#)

6.4.4 Copying the Database Only - Refresh Database Content on IBM Db2 for z/OS

Using the [Refresh Database Content](#) option in the software provisioning manager, you can refresh the **content** of an existing database **using a database backup** without having to copy the primary application server instance and to reinstall additional applications servers. No new database instance is installed. You can do 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.
- Prerequisite for using a database-specific method is that source and target database version are identical.
- Make sure that you have the password for the DDIC user in client 000 of your source system at hand. The software provisioning manager will prompt you for this password during the [Refresh Database Content](#) procedure.


Context

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.












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 \[page 126\]](#).

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 \[page 128\]](#)

For more information, see <https://blogs.sap.com/2017/03/02/refresh-database-content-without-reinstalling-the-database-or-kernel-for-abap-systems/> 

Using the SAP Standard Method

1. On the source system, do the following:
 1. Stop the SAP system.
 2. Perform the database instance export as follows:
 1. Start the software provisioning manager on the database host as described in [Exporting the Source System \[page 65\]](#).
 2. On the *Welcome* screen, run option  **<Product>**  **<Database>**  **System Copy**  **Source System**  **Based on AS ABAP**  **Database Instance Export** 
2. On the target system, do the following:
 1. Stop all SAP application server instances, but leave the ASCS instance running
 2. Refresh the database content as follows:
 1. Start the software provisioning manager on the database host as described in [Exporting the Source System \[page 65\]](#).
 2. On the *Welcome* screen, run option  **Generic Options**  **<Database>**  **Refresh Database Content** 

Using the Database-Specific Method

1. Execute all steps as described in section [IBM Db2 for z/OS Specific Procedures \[page 116\]](#).
2. Refresh the database content as follows:
 1. Start the software provisioning manager on the database host as described in [Exporting the Source System \[page 65\]](#).
 2. On the *Welcome* screen, run option ► *Generic Options* ► *<Database>* ► *Refresh Database Content* ►

Next Steps

Perform the follow-up activities for system copy.

For more information, see [Follow-Up Activities \[page 155\]](#).

Related Information

[Running Software Provisioning Manager \[page 68\]](#)

[Follow-Up Activities \[page 155\]](#)

6.4.5 Copying the Database Only - Refresh Database Content on SAP MaxDB

Using the *Refresh Database Content* option in the software provisioning manager, you can refresh the **content** of an existing database **using a database backup** without having to copy the primary application server instance and to reinstall additional applications servers. No new database instance is installed. You can do 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.
- If you want to use the database backup/restore method, source and target database version must match. You cannot use a target database version that is lower than the source database version.
- No kernel media and no RDBMS media are required.
- Make sure that you have the password for the DDIC user in client 000 of your source system at hand. The software provisioning manager will prompt you for this password during the *Refresh Database Content* procedure.


Context

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 \[page 126\]](#).

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 \[page 128\]](#)





For more information, see <https://blogs.sap.com/2017/03/02/refresh-database-content-without-reinstalling-the-database-or-kernel-for-abap-systems/> 

Using the SAP Standard Method

On the source system, do the following:

1. Stop the SAP system.
2. Perform the database instance export as follows:
 1. Start the software provisioning manager on the database host as described in [Exporting the Source System \[page 65\]](#).
 2. On the *Welcome* screen, run option  *<Product>*  *<Database>*  *System Copy*  *Source System*  *Based on AS ABAP*  *Database Instance Export* 

On the target system, do the following:

1. Stop all SAP application server instances, but leave the ASCS instance and the database instance running.
2. Refresh the database content as follows:
 1. Start the software provisioning manager on the database host as described in [Exporting the Source System \[page 65\]](#).
 2. On the *Welcome* screen, run option  *Generic Options*  *<Database>*  *Refresh Database Content* 











Using the Database Backup/Restore Method

On the source system, do the following:

Create Database Backup. If you want to import the content using the software provisioning manager, you perform the backup into single backup file.

You can also use other backup types. In this case, you must do the restore of the content manually, the software provisioning manager will stop when reaching the appropriate processing step. For more information, see [SAP MaxDB-Specific Procedure \[page 109\]](#), subsection *Prerequisites*.

On the target system, do the following:

1. Stop all SAP application server instances, but leave the ASCS instance and the database instance running.
2. Make the backup available on the target system.
3. Define the backup template, which is referencing the backup from the source system. For more information regarding backup template definition read MaxDB online Help at <http://maxdb.sap.com>   [Documentation](#)  [SAP MaxDB <version> Library](#)  [Database Administration](#)  [Backing Up Databases](#) .
4. Refresh the database content as follows:
 1. Start the software provisioning manager on the database host as described in [Exporting the Source System \[page 65\]](#).
 2. On the *Welcome* screen, run option  [Generic Options](#)  [<Database>](#)  [Refresh Database Content](#) .

Next Steps

Perform the follow-up activities for system copy.

For more information, see [Follow-Up Activities \[page 155\]](#).

Related Information

[Running Software Provisioning Manager \[page 68\]](#)

[SAP MaxDB-Specific Procedure \[page 109\]](#)

[Follow-Up Activities \[page 155\]](#)

7 Database Migration Option Preparation

In this section, you can find the preparation steps for Database Migration Option (DMO) for Software Update Manager (SUM) with the currently supported target databases.

For more information about Database Migration Option (DMO) for Software Update Manager (SUM), see the documentation *Upgrade Guide - Database Migration Option of Software Update Manager 1.0 SP<current number> / 2.0 SP<current number> - Target Database: <Supported Database>* at: <https://support.sap.com/sltoolset> > System Maintenance > Database Migration Option (DMO) with SUM 1.0 SP<current number> / SUM 2.0 SP<current number> > Guides for DMO with SUM 1.0 SP<current number> / SUM 2.0 SP<current number>

⚠ Caution

Creating the DMO target database with enabled SSL is **not** supported for SAP ASE. For an existing SAP System on SAP ASE, SSL can only be enabled by using either the [Database Independent System Copy \[page 51\]](#) or the [SAP ASE 16.0 Server-Specific Procedure \[page 123\]](#) of software provisioning manager 1.0.

[SAP ASE 16.0 only: Preparing Target Database SAP ASE \[page 147\]](#)

You use the software provisioning manager to prepare the target database SAP ASE 16.0 for the Software Update Manager (SUM) with Database Migration Option (DMO) run.

[Preparing Target Database IBM Db2 for Linux, UNIX, and Windows \[page 149\]](#)

You use the software provisioning manager to prepare the target database IBM Db2 for Linux, UNIX, and Windows for the Software Update Manager (SUM) with Database Migration Option (DMO) run.

[Preparing Target Database SAP MaxDB \[page 151\]](#)

You use the software provisioning manager to prepare the target database SAP MaxDB for the Software Update Manager (SUM) with Database Migration Option (DMO) run.

[Preparing Target Database Oracle \[page 153\]](#)

Prepare the target database Oracle for the Software Update Manager (SUM) with Database Migration Option (DMO) run.

7.1 SAP ASE 16.0 only: Preparing Target Database SAP ASE

You use the software provisioning manager to prepare the target database SAP ASE 16.0 for the Software Update Manager (SUM) with Database Migration Option (DMO) run.

⚠ Caution

Creating the DMO target database with enabled SSL is **not** supported for SAP ASE. For an existing SAP System on SAP ASE, SSL can only be enabled by using either the [Database Independent System Copy \[page 51\]](#) or the [SAP ASE 16.0 Server-Specific Procedure \[page 123\]](#) of software provisioning manager 1.0.

i Note

If you have already executed the *DMO Benchmarking Option* or aborted a DMO run and want to restart from the beginning, you must delete all objects belonging to SAPSR3 in the database <SAPSID> within the SAP ASE database as described in SAP Note [2523137](#). You can then skip the rest of this section

Prerequisites

- Your target database release is not higher than SAP ASE 16.0.
- You have **not** yet installed a SAP ASE target database.
- You have downloaded and extracted the SWPM10SP<Support_Package_Number>_<Version_Number>.SAR archive both on the source and on the target host as described in [Downloading and Extracting the Software Provisioning Manager 1.0 Archive \[page 46\]](#).

⚠ Caution

Make sure that both on the source and on the target host you use the SWPM10SP<Support_Package_Number>_<Version_Number>.SAR archive for running the software provisioning manager.

Do **not** use the 70SWPM10SP<Support_Package_Number>_<Version_Number>.SAR because the software provisioning manager version in this archive does **not** contain the *Database Migration Option* preparation.

Procedure

Use the software provisioning manager to install and configure the SAP ASE Server database for the DMO scenario as follows:

1. Create the database sizing for the target database.
 - a. Start the software provisioning manager on an application server instance host of the **source** system.
For more information, see [Running Software Provisioning Manager \[page 68\]](#)
 - b. On the *Welcome* screen choose ► *Generic Options* ► *SAP ASE* ► *Preparations* ► *Database Migration Option* ► *Create Database Sizing* ►.

This option calculates appropriate database sizing and estimates the space requirements for the SAP ASE target database in your DMO scenario.
2. Prepare the target database instance.
 - a. Start the software provisioning manager on the **target** database host.
For more information, see [Running Software Provisioning Manager \[page 68\]](#)
 - b. On the *Welcome* screen choose ► *Generic Options* ► *SAP ASE* ► *Preparations* ► *Database Migration Option* ► *Prepare Database Instance* ►.

This option configures an empty SAP NetWeaver-like target database and creates the database including logins, schema, and users for your DMO target system.

- c. Follow the instructions on the software provisioning manager screens and provide the following information:
 - In the *General Parameters* screen, provide the profile directory of the DMO source system.
 - For SAP System ID (<SAPSID>) enter the same <SAPSID> as used within the source system. The Database ID <DBSID> must be the same as the <SAPSID>.
 - For the SAP kernel, provide the installation kernel media of the SAP target system release.
 - For the migration export, specify the *Database Sizing Export* directory that was created with the option Create Database Sizing.

Next Steps

After you have completed DMO preparation, you can run DMO as described in <https://support.sap.com/sltoolset> >> *System Maintenance* > *Database Migration Option (DMO) of SUM SP<Number>*.

Consider the documentation *SAP Applications on SAP Adaptive Server Enterprise - Best Practices for Migration and Runtime* to adjust the SAP ASE database configuration parameters. You can find this documentation attached to SAP Note [1680803](#).

Related Information

[Running Software Provisioning Manager \[page 68\]](#)

7.2 Preparing Target Database IBM Db2 for Linux, UNIX, and Windows

You use the software provisioning manager to prepare the target database IBM Db2 for Linux, UNIX, and Windows for the Software Update Manager (SUM) with Database Migration Option (DMO) run.

Prerequisites

- You have downloaded and extracted the SWPM10SP<Support_Package_Number>_<Version_Number>.SAR archive both on the source and on the target host as described in [Downloading and Extracting the Software Provisioning Manager 1.0 Archive \[page 46\]](#).

⚠ Caution

Make sure that both on the source and on the target host you use the SWPM10SP<Support_Package_Number>_<Version_Number>.SAR archive for running the software provisioning manager.

Do **not** use the 70SWPM10SP<Support_Package_Number>_<Version_Number>.SAR because the software provisioning manager version in this archive does **not** contain the [Database Migration Option](#) preparation.

- You have made yourself familiar with the installation parameters for the IBM Db2 for Linux, UNIX, and Windows database as listed in section ► [Planning](#) ► [Basic Installation Parameters](#) ► [SAP System Database Parameters](#) ► of the documentation *Installation Guide - SAP Systems Based on the Application Server ABAP of SAP NetWeaver 7.1 to 7.5 on UNIX : IBM Db2 for Linux, UNIX, and Windows* (see [Accessing the Installation Guides \[page 24\]](#)).

Procedure

Use the software provisioning manager to install and configure the IBM Db2 for Linux, UNIX, and Windows database for the DMO scenario as follows:

1. [Start the software provisioning manager \[page 68\]](#) on an application server instance host of the **source** system.

On the [Welcome](#) screen, choose option ► [Generic Options](#) ► [IBM Db2 for Linux, UNIX, and Windows](#) ► [Preparations](#) ► [Database Migration Option](#) ► [Create Database Sizing](#) ►.

This option calculates appropriate database sizing and estimates the space requirements for the target database IBM Db2 for Linux, UNIX, and Windows in your DMO scenario.

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.

2. [Start the software provisioning manager \[page 68\]](#) on the DMO target host - this is the host where you want to migrate the IBM Db2 for Linux, UNIX, and Windows database.

On the [Welcome](#) screen, choose option ► [Generic Options](#) ► [IBM Db2 for Linux, UNIX, and Windows](#) ► [Preparations](#) ► [Database Migration Option](#) ► [Prepare Database Instance](#) ►.

This option configures an empty SAP NetWeaver-like target database and creates the database including logins, schema, and users for your DMO target system.

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.

Provide the following information:

- For the systems profile, provide the profile directory of the DMO source system.
- For the SAP kernel, provide the installation kernel media of the SAP target system release.
For more information about how to get the installation kernel media, see section [► Preparation ► Preparing the Installation Media ►](#) in the documentation *Installation Guide - SAP Systems Based on the Application Server ABAP of SAP NetWeaver 7.1 to 7.5 on UNIX : IBM Db2 for Linux, UNIX, and Windows* (see [Accessing the Installation Guides \[page 24\]](#)).
- For the IBM Db2 for Linux, UNIX, and Windows database, choose to create a new database with the same *<DBSID>* as the source system *<DBSID>*.
- For the migration export, specify the database sizing export directory that you created by running option *Create Database Sizing*.

Next Steps

After you have completed DMO preparation, you can run DMO as described in <https://support.sap.com/slttoolset> ► ► *System Maintenance ► Database Migration Option (DMO) of SUM SP<Number> ►*.

Related Information

[Running Software Provisioning Manager \[page 68\]](#)

7.3 Preparing Target Database SAP MaxDB

You use the software provisioning manager to prepare the target database SAP MaxDB for the Software Update Manager (SUM) with Database Migration Option (DMO) run.

Prerequisites

- Make sure that you have successfully installed a SAP MaxDB database using software provisioning manager by following the procedure below.
- You have downloaded and extracted the
SWPM10SP<Support_Package_Number>_<Version_Number>.SAR archive both on the source and on

the target host as described in [Downloading and Extracting the Software Provisioning Manager 1.0 Archive \[page 46\]](#).

⚠ Caution

Make sure that both on the source and on the target host you use the SWPM10SP<Support_Package_Number>_<Version_Number>.SAR archive for running the software provisioning manager.

Do **not** use the 70SWPM10SP<Support_Package_Number>_<Version_Number>.SAR because the software provisioning manager version in this archive does **not** contain the [Database Migration Option](#) preparation.

Procedure

Use the software provisioning manager to install and configure the SAP MaxDB Server database for the DMO scenario as follows:

1. Create the database sizing for the target database.
 - a. Start the software provisioning manager on an application server instance host of the **source** system.

For more information, see [Running Software Provisioning Manager \[page 68\]](#)

- b. On the [Welcome](#) screen choose ► [Generic Options](#) ► [MaxDB](#) ► [Preparations](#) ► [Database Migration Option](#) ► [Create Database Sizing](#) ►.

This option calculates appropriate database sizing and estimates the space requirements for the SAP MaxDB target database in your DMO scenario.

2. Prepare the target database instance.
 - a. Start the software provisioning manager on the **target** database host.

For more information, see [Running Software Provisioning Manager \[page 68\]](#)

- b. On the [Welcome](#) screen choose ► [Generic Options](#) ► [MaxDB](#) ► [Preparations](#) ► [Database Migration Option](#) ► [Prepare Database Instance](#) ►.

This option configures an empty SAP NetWeaver-like target database and creates the database including logins, schema, and users for your DMO target system.

- c. Follow the instructions on the software provisioning manager screens and provide the following information:
 - In the [General SAP System Parameters](#) screen, provide the profile directory of the DMO source system.
 - For the [Database ID \(<DBSID>\)](#) enter the SAP MaxDB target database ID. You can choose any <DBSID> that is not among the reserved IDs listed in SAP Note [1979280](#) ➡.
 - For the SAP kernel, provide the installation kernel media of the SAP target system release. For more information, see section [Preparing the Installation Media](#) the installation guide for your operating system and database at <http://support.sap.com/sltoolset> ➡ ► ► [System Provisioning](#) ► [Installation Option](#) ► [Guide for Systems Based on SAP NetWeaver 7.1 and Higher](#) ►.
 - For the migration export, specify the [Database Sizing Export](#) directory that was created with the option [Create Database Sizing](#).

Next Steps

After you have completed DMO preparation, you can run DMO as described in <https://support.sap.com/slttoolset> ► ► *System Maintenance* ► *Database Migration Option (DMO) of SUM SP<Number>* ►.

Related Information

[Running Software Provisioning Manager \[page 68\]](#)

7.4 Preparing Target Database Oracle

Prepare the target database Oracle for the Software Update Manager (SUM) with Database Migration Option (DMO) run.

Prerequisites

Make sure that the Oracle database software is installed and that an `oracle` user account is available.

If they are not yet available, you can create them as follows:

1. Start the software provisioning manager as described in [Running Software Provisioning Manager \[page 68\]](#).
2. On the *Welcome* screen, choose ► *Generic Options* ► *Oracle* ► *Preparations* ► *Operating System Users and Groups* ►.

While running this option, you can also install the Oracle RDBMS software. For more information, see *Oracle Database Software Installation* in the [installation guide \[page 24\]](#).

Context

Use the software provisioning manager to install and configure the Oracle Server database for the DMO scenario as follows.

Procedure

1. Start the software provisioning manager as described in [Running Software Provisioning Manager \[page 68\]](#).

2. On the *Welcome* screen choose **Generic Options** > **Oracle** > **Preparations** > **Database Migration Option**.

3. Select *Create Database Sizing*. Execute this option on an application server of the source system.

It calculates appropriate database sizing and estimates the space requirements for the target database Oracle in your DMO scenario.

4. Select *Prepare Database Instance*. Execute this option on the DMO target database host.

It configures an empty SAP NetWeaver-like target database and creates the following for your DMO target system:

- Database
- `oracle` tablespaces
- An empty SAP schema (default `SAPSR3`) and user

Provide the following information:

- In the *General SAP System Parameters* screen, make sure that the *Profiles Available* checkbox is **deselected**.
- For the *Database ID (DBSID)* enter the Oracle target database ID.
- For the SAP kernel, provide the installation kernel media of the SAP target system release. For more information, see section *Preparing the Installation Media* the [installation guide \[page 24\]](#) for your operating system and database.
- For the migration export, specify the *Database Sizing Export* directory that was created with the option *Create Database Sizing*.
- In the *DMO Tablespace Configuration* screen, specify the DMO target release.

❖ Example

Provide **752** for creating release-specific tablespace *PSAPSR3<Release>* if your target release is 752.

8 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.

[Performing Follow-Up Activities in the Source System \[page 155\]](#)

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 \[page 156\]](#)

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 \[page 155\]](#)

[Performing Follow-Up Activities in the Target System \[page 156\]](#)

8.1 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 \[page 42\]](#).

2. Using CCMS, adapt your operation mode timetable to the original status (transaction SM37).

8.2 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.

Note

Make sure that you also complete the post-installation steps contained in the [installation guide \[page 24\]](#). This system copy guide describes only the system copy-specific steps that are required in addition.

[Activities at Operating System Level \[page 156\]](#)

This section includes the adaptations that you have to make at operating system level in your target system.

[Performing Follow-Up Activities for ABAP \[page 157\]](#)

8.2.1 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](#).
12. **Oracle only:** Adapt the database profiles `init<SAPSID>.ora`, `init<SAPSID>.dba`, and `init<SAPSID>.sap`.

8.2.2 Performing Follow-Up Activities for ABAP

i Note

Make sure that you also complete the post-installation steps contained in the [installation guide \[page 24\]](#). This system copy guide describes only the system copy-specific steps that are required in addition.

[General Follow-Up Activities \[page 157\]](#)

[Activities at SAP System Level \[page 161\]](#)

This section includes the adaptations that you have to make at SAP system level in your target system.

[Product-Specific Follow-Up Activities \[page 166\]](#)

[Checking the Target System \[page 168\]](#)

The following actions are required for checking the consistency of the target system.

8.2.2.1 General Follow-Up Activities

i Note

Make sure that you also complete the post-installation steps contained in the [installation guide \[page 24\]](#). This system copy guide describes only the system copy-specific steps that are required in addition.

8.2.2.1.1 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. **Oracle Database only:**
 - a. Delete all entries from the following tables:
DBSTATHORA, DBSTAIHORA, DBSTATIORA, DBSTATTORA.
 - b. Delete the user OPS\$<SOURCE_SAPSID>ADM (if existing).
 - c. If you changed the <DBSID> during the system copy, we recommend that you adapt the global_name parameter by using the following SQL command:

```
alter database rename global_name to <NEW_DBSID>;
```

If the parameter does not exist on your system, ignore this step.

6. Run report RSSDBTICMCLEANUP in the following cases:

- You copied a system using SAP MaxDB in both the source system and the target system.
- You copied a system and changed the database platform from SAP MaxDB to a different database platform.

For more information, see **SAP Note 1179714** .

8.2.2.1.1.1 Checking the Database Parameters for IBM Db2 for Linux, UNIX, and Windows

i Note






This section is only valid if your database is IBM Db2 for Linux, UNIX, and Windows.




After installation has completed, make sure that you check the parameters of the database configuration and of the database manager configuration. A check of the database parameters ensures that your database parameters conform with the latest SAP recommendations where necessary and are adapted to your needs.

Procedure

You can check the parameters of the database in one of the following ways:

- Compare the current parameters of your database with the parameters as they are recommended for SAP systems in the following SAP Notes:

Database Version	Corresponding SAP Note
IBM Db2 V9.7	1329179 
IBM Db2 10.1	1692571 
IBM Db2 10.5	1851832 
IBM Db2 11.1	2303771 
IBM Db2 11.5	2751102 

- Use the DBA Cockpit to compare the current parameters with the standard parameters. In the DBA Cockpit (transaction DBACOCKPIT), on the [Database](#) tab page, choose  [Configuration](#)  [Parameter Check](#) .

i Note

The parameter check in the DBA Cockpit is available as of SAP Basis 7.00 with enhancement package 2 and support package 6. For more information about the parameter check, see the *Database Administration*

Guide: Database Administration Using the DBA Cockpit – IBM Db2 for Linux, UNIX, and Windows listed in [Online Information from SAP \[page 223\]](#).

8.2.2.1.1.2 Performing Jobhead Correction after Homogeneous System Copy

This topic is only valid for 'Platform': z/OS

Use

Note

This section is only relevant for customers using CCMS to monitor their SAP systems.

After copying your system, the CCMS jobhead still points to the former database SSID. To complete the homogeneous system copy, the SSID needs to be set to the target system.

Caution

Only experienced users should use this utility.

Procedure

To set the SSID to the target system:

1. Call transaction DBACOCKPIT.
2. Choose ► [Configuration](#) ► [Homogeneous System Copy: Jobhead Correction](#) ►
3. Modify the necessary data.

End of 'Platform': z/OS

8.2.2.1.2 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 \[page 24\]](#) 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 \[page 24\]](#), and then continue the navigation as described below.

SAP Release and SAP Library Quick Link	SAP Library Path (Continued)
<ul style="list-style-type: none">SAP NetWeaver 7.3 including Enhancement Package 1 http://help.sap.com/nw731SAP NetWeaver 7.4 http://help.sap.com/nw74SAP NetWeaver 7.5 http://help.sap.com/nw75SAP NetWeaver Application Server for ABAP 7.51 innovation package https://help.sap.com/nw751abapSAP NetWeaver AS for ABAP 7.52 https://help.sap.com/nw752abap	<p>► <i>Application Help</i> ► <i>SAP NetWeaver Library: Function-Oriented View</i> ► <i>Solution Life Cycle Management</i> ► <i>SAP Licenses</i> ►</p>

More Information

For more information about how to order permanent SAP license keys, see <https://support.sap.com/licensekey>.

8.2.2.1.3 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](#).

8.2.2.2 Activities at SAP System Level

This section includes the adaptations that you have to make at SAP system level in your target system.

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 \[page 24\]](#) 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 \[page 24\]](#), and then continue the navigation as described below.

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 165]

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 RDDNEWPP 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.

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 \[page 22\]](#) and the [SAP Library \[page 24\]](#) 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 \[page 42\]](#). 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

Relevant for IBM Db2 for Linux, UNIX, and Windows (IBM Db2) version 10.5 and higher only: If you want to implement DB2 BLU Acceleration on your migrated SAP BW system, also follow the instructions in the appendix of the database administration guide *SAP Business Warehouse on IBM Db2 for Linux, UNIX, and Windows: Administration Tasks*, available at https://help.sap.com/viewer/db6_admin.

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 \[page 165\]](#)

8.2.2.2.1 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 \[page 24\]](#) 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 \[page 24\]](#), 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 \[page 24\]](#) 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 \[page 24\]](#), 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 \[page 24\]](#) 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 \[page 24\]](#), 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** .

8.2.2.3 Product-Specific Follow-Up Activities

Related Information

[Business Warehouse \(BW\) Specific Follow-Up Activities \[page 166\]](#)

[Embedded Search \[page 167\]](#)

8.2.2.3.1 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/> 

8.2.2.3.2 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

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 \[page 24\]](#) 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 \[page 24\]](#), and then continue the navigation as described below.

► [Search](#) ► [Search Services in SAP NetWeaver AS ABAP](#) ► [Embedded Search](#) ► [Setting Up Embedded Search](#) ► [Creating Connectors](#) ►

8.2.2.4 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 SAPF190 (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.

9 Additional Information

Related Information

[R3load Procedures Using the Migration Monitor \[page 169\]](#)

[Analysis of the Export and Import Times \[page 197\]](#)

[Table Comparison with Software Update Manager \[page 197\]](#)

[Using the Package Splitter \[page 202\]](#)

[Database Instance Installation on Oracle Automatic Storage Management \[page 215\]](#)

[Additional Information about the “OraBRCopy” Tool \[page 219\]](#)

[Online Information from SAP \[page 223\]](#)

9.1 R3load Procedures Using the Migration Monitor

This section contains user documentation about the migration monitor system copy tool.

[About the Migration Monitor \[page 170\]](#)

This section lists the functions and features of the migration monitor.

[Configuration \[page 172\]](#)

[Assigning DDL Files to Packages \[page 185\]](#)

[Defining Groups of Packages \[page 186\]](#)

[Processing Split Tables \[page 187\]](#)

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 \[page 188\]](#)

[Using the migmonCtrl Add-On for the Export \[page 193\]](#)

[Output Files \[page 195\]](#)

[Installing the Target System Using the Migration Monitor \[page 196\]](#)

9.1.1 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.

Note

IBM Db2 for Linux, UNIX, and Windows only:

If you run the migration monitor manually for the import phase, you must use the DDLDB6.TPL file that was created by SWPM during the system copy on the target system. This file is located in the installation directory. It might be different than the DDLDB6.TPL file located with your export. This will be the case if your target system uses tablespace pools and your source system does not.

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 \[page 188\]](#).

When you start the migration monitor manually:

- You can adjust any parameters. For more information, see [Configuration \[page 172\]](#).
- 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.

9.1.2 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
monitorTimeout	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
bg	Enables background mode	Takes effect only as command line option
		If the tool is running in background mode, the UNIX shell windows or Windows command prompt can be closed after startup.

Name	Description	Name
secure	Enables secure mode	<p>Takes effect only as command line option</p> <p>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.</p> <div> <p>i Note</p> <p>Use this mode if you have to specify passwords on the command line.</p> </div>
trace	Trace level	<p>Possible values:</p> <p>all, off, 1 (error), 2 (warning), 3 (info), 4 (config, <i>default</i>), 5, 6, 7 (trace)</p>

Export Monitor – Options


Export Options

Option	Description	Comment
installDir	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 R3load TSK and log files are written.
exportDirs	List of export directories	<p>Separator on Windows: “;”</p> <p>Separator on UNIX, IBM i: “:”</p> <p>The exportDirs parameter points to the directory where the R3load dump files are written. In the exportDirs directory, the subdirectories DATA, DB, and DB / <TARGET_DBTYPE>. For example, DB/ORA must exist.</p>
client	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.

Option	Description	Comment
server	Server operating mode	Running in server mode means that the migration monitor creates R3load TSK files (if necessary), R3load cmd files, and starts the R3load processes.
All options below are for server mode . The import monitor always runs in server mode. If you want to run the export monitor in server mode, specify the server parameter in the properties file of the export monitor.		
orderBy	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.
ddlFile	DDL control file	Path or filename of DDL control file The default is DDL<DBTYPE>.TPL . If the filename is used without a path, the DDL control file from the export DB subdirectory is used.
ddlMap	DDL mapping file	File with mapping between DDL files and package names
r3loadExe	Path of the R3load executable	Optional; default is R3load . If only the name of the R3load executable is available, the JVM looks for the R3load executable using operating system-specific process search rules.
tskFiles	yes to create task files; no to skip	Up to and including version 4.6, this must be set to no ; as of version 4.7 set to yes . If the R3load task files *.TSK already exist, the monitor does not overwrite them.
dataCodepage	Code page for data files	See SAP Note 552464 . Possible values: 4102 , 4103 , 1100
taskArgs	Additional R3load arguments for the TASK phase	Appended to the R3load command line Options already set by the monitor: -ctf ; -l
loadArgs	Additional R3load arguments for the LOAD phase	Appended to the R3load command line. Options already set by the monitor: -e ; -datacodepage ; -l ; -p ; -r ; -socket (if the socket option is specified); -o (if the omit argument is specified and task files are not used, that is, the value of the tskFiles option is no).
jobNum	Number of parallel export jobs, default: 1	Any positive number The value can be changed dynamically at runtime.



Option	Description	Comment
decluster (use this option only for target dbType = HDB)	Default value is false	Possible values : true or false If this option is true , the migration monitor calls R3load with option -decluster .
firstExportSAPNTAB	Default values is false	Possible values: true or false If this option is true, the migration monitor first exports the SAPNTAB package in single thread mode.
onlyProcessOrderBy		If set to true only the jobs from file configured with orderBy are processed.

Network Exchange Options

Option	Description	Comment
net	Network operating mode	Exported dump files must be visible on the import host to use this mode.
netExchangeDir	Network exchange directory	<div>  Caution Clean up the netExchangeDir 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 <Package>.SGN 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
ftp	FTP operating mode	Exported dump files are transferred automatically from the source host (directory exportDirs) to the target host (directory importDirs) using FTP.
ftpHost	Remote FTP host	Name or IP address of the import server

Option	Description	Comment
ftpUser	Name of the remote FTP user	The FTP user specified here should be <sapsid>adm to make sure that the package files can be read during the import (which is started as <sapsid>adm).
ftpPassword	Password of the remote FTP user	<div>  Caution Security risk. </div> <p>For more information, see the secure parameter in section <i>Additional Options</i>.</p>
ftpExportDirs	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 importDirs in the properties file of the import monitor.
ftpExchangeDir	Remote FTP exchange directory	<p>Used for communication between the export and import monitors.</p> <p>Must be writable for the export monitor and readable for the import monitor.</p> <div>  Caution Clean up the ftpExchangeDir before starting a new export. </div> <p>The export monitor writes a <Package>.SGN 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.</p>
ftpJobNum	Number of parallel FTP jobs; the default is 1 .	<p>Any positive number; 0 for an unlimited number of jobs</p> <p>The value can be changed dynamically at runtime.</p>

Export Socket Host

Option	Description	Comment
socket	Socket operating mode	R3load does not write dump files to the file system but the export and import work through the socket connection.
host	Remote import host	Name or IP address of the import host.
port	Host port number	Must be the same as the port number on the import host. Any free port on the import host from 1024 to 65535 .

FTP Copy Options

Option	Description	Comment
ftpCopy	FTP copy operating mode	Used as a separate program call for migration with sockets if no share directory is used. All files produced by R3ldctl and R3szchk are transferred from the source to the target host using FTP.
exportDirs	List of export directories	<p>Separator on Windows: ";"</p> <p>Separator on UNIX, IBM i: ":"</p> <p>In the exportDirs directory, the subdirectories DATA, DB, and DB/<TARGET_DBTYPE> (for example, DB/ORA) must exist. The R3load STR files have to exist in the subdirectory DATA, the DDL*.TPL files in the subdirectory DB, and the R3load EXT files (if required) in the subdirectory DB/<TARGET_DBTYPE>.</p>
ftpHost	Remote FTP host	Name or IP address of the import server
ftpUser	Name of the remote FTP user	The FTP user specified here must be <sapsid>adm to make sure that the package files can be read during the import (which is started as <sapsid>adm).
ftpPassword	Password of the remote FTP user	<div>  Caution Security risk </div>
ftpExportDirs	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 importDirs 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
<code>migmonCtrl</code>	Enabling the add-on	-
<code>orderBy</code>	File with package order	<p>If <code>migmonCtrl</code> is set, the file is created dynamically. It still has the same format as the <code>order_by</code> file, which you can create manually.</p> <p>If it is created by the add-on, the file has two groups called <code>LARGE</code> and <code>SMALL</code>.</p> <p>Depending on the sort order (size or runtime), the packages are listed from <code>biggest/longest</code> to <code>smallest/shortest</code> in group <code>LARGE</code> and from smallest to biggest in group <code>SMALL</code>. 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>
<code>jobNumLarge</code>	Amount of jobs set in group <code>LARGE</code>	The number can be changed during runtime.
<code>jobNumSmall</code>	Amount of jobs set in group <code>SMALL</code>	<p>The number can be changed during runtime.</p> <p>To keep up the number of <code>jobNumLarge</code> + <code>jobNumSmall</code>, packages from group <code>LARGE</code> are moved into group <code>SMALL</code> when the number of unprocessed packages in group <code>SMALL</code> becomes smaller than <code>jobNumSmall</code>.</p> <p>In addition to that, <code>jobNumSmall</code> is increased when the number of unprocessed packages in group <code>LARGE</code> becomes smaller than <code>jobNumLarge</code>.</p>

Option	Description	Comment
customSortOrderFile	-	If certain jobs need to be exported right from the start, they can be configured in this file.
		SAPAPPL0_24_1 REPOSRC T100 /BIC/ MYBWTABLE

Export by Size

Option	Description	Comment
extFileDir	Absolute path of EXT files generated by R3szchk	Mandatory if the export is to be sorted by size

Export by Runtime

Option	Description	Comment
exportTimeFile	Absolute path of file export_time.txt created by migtime.jar	Mandatory if the export is to be sorted by runtime
importTop	Amount of analyzed packages used from file import_time.txt	Can only be used if parameter importTimeFile is set For parallel export/import, long running jobs on the import side need to be exported first. The importTop option adds the long running jobs on top of group LARGE .
importTimeFile	Absolute path of file import_time.txt created by migtime.jar	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
createPackageFilter		Needs to be set to create package filter files.

Option	Description	Comment
<code>excludePackage</code>	Comma separated string	Packages that must not be included in the filter file
<code>outputFile</code>	<code>package_list_%hostName%.txt</code>	Location and name of result files <code>%hostName%</code> is replaced with the actual name of the host.
<code>hostNames</code>	Comma separated string	The names are only used for the file name: <code><outputFile>_<hostName>.txt</code>

Using Package Filter Files

Option	Description	Comment
<code>onlyProcessOrderBy</code>	-	If this option is set to <code>true</code> , only the jobs from <code>orderBy</code> 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 <code>parallel export/import</code> 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 (<code>software provisioning manager 1.0.R3SETUP</code>) are started.</p> <p>When you run the migration monitor without using the installation tools, the installation directory is the directory where the <code>R3load TSK</code> and log files are created.</p>
<code>importDirs</code>	List of import directories	<p>Separator on Windows: “;”</p> <p>Separator on UNIX, IBM i: “:”</p> <p>The <code>importDirs</code> parameter points to the directory where the R3load dump files are written. In the <code>importDirs</code> directory, the subdirectories <code>DATA</code>, <code>DB</code>, and <code>DB/<TARGET_DBTYPE></code> (for example, <code>DB/ORA</code>) must exist.</p>
<code>orderBy</code>	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">• <code>name:</code> Load packages in alphabetical order• <code>size:</code> Load packages starting with the largest one or a path of the file that contains the package names <p>If the option is omitted then the package order is not defined.</p>

Option	Description	Comment
ddlFile	DDL control file	<p>Path or file name of DDL control file</p> <p>The default is DDL<DBTYPE>.TPL. If the file name is used without path, the DDL control file from the export DB subdirectory is used.</p> <div> <p>i Note</p> <p>IBM Db2 for Linux, UNIX, and Windows only:</p> <p>If you run the migration monitor manually for the import phase, you must use the DDLDB6.TPL file that was created by SWPM during the system copy on the target system. This file is located in the installation directory. It might be different than the DDLDB6.TPL file located with your export. This will be the case if your target system uses tablespace pools and your source system does not.</p> </div>
ddlMap	DDL mapping file	File with mapping between DDL files and package names
r3loadExe	Path of the R3load executable	<p>Optional; default is R3load.</p> <p>If only the name of the R3load executable is available, the JVM looks for the R3load executable using operating system-specific search rules for the process.</p>
tskFiles	yes to create task files; no to skip	<p>Before version 4.6, this must be set to no.</p> <p>Starting from version 4.7, it must be set to yes.</p> <p>If the R3load task files *.TSK already exist, the monitor does not overwrite them.</p>
extFiles	yes to include EXT files; no to skip them	<p>Add EXT file entries to cmd files.</p> <p>If the EXT files cannot be found in the DB/ <TARGET_DBTYPE> import dump subdirectory, the package processing is aborted.</p>
dbCodepage	Database code page for the target database	<p>See SAP Note 552464 .</p> <p>Possible values are: 4102, 4103, 1100</p>
migrationKey	Migration key	-

Option	Description	Comment
omit	R3load omit value	<p>Can contain only DTPIVAFLMU letters.</p> <p>-omit D: omit data; do not load data</p> <p>-omit T: omit tables; do not create tables</p> <p>-omit P: omit primary keys; do not create primary keys</p> <p>-omit I: omit indexes; do not create indexes</p> <p>-omit V: omit views; do not create views.</p> <p>-omit A: omit AMDPs; do not create ABAP managed procedures</p> <p>-omit F: omit flexible objects; do not create flexible objects (database functions, database filter rules, session variables)</p> <p>-omit L: omit flexible indexes; do not create flexible indexes</p> <p>-omit U: omit unload; do not unload table after data load</p> <p>If you want to combine several -omit options, list these options without blank, for example -omit TV.</p> <p>Alternatively, option -include can be used to specify a positive list of task types, which have to be executed (any unspecified task types are omitted):</p> <p>-include <task-type-list></p> <p>The -include option supports the same list of tasks as the omit option. For example, -include TDPIMU generates 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>
taskArgs	Additional R3load arguments for the TASK phase	<p>Appended to the R3load command line</p> <p>The following options are already set by the monitor:</p> <p>-ctf; -l; -o (if the omit argument is specified).</p>
loadArgs	Additional R3load arguments for the LOAD phase	<p>Appended to the R3load command line</p> <p>The following options are already used by the monitor:</p> <p>-i; -dbcodepage; -l; -p; -k; -r; -socket (if the socket option is specified);</p> <p>-o (if the omit argument is specified and task files are not used, that is, the value of taskFiles option is no).</p>

Option	Description	Comment
jobNum	Number of parallel import jobs; the default is 1 .	Any positive number; 0 for an unlimited number of jobs You can change the value dynamically at runtime.
decluster (use this option only for target dbType = HDB)	false	Possible values : true or false If this option is true – migmon calls R3load with option –decluster.
ignorePackageSizeCalculation	Default is false	Possible values : true or false 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 importDirs parameter. In this first step, called CollectPackages , 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 CollectPackages step, set this option to true . 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.
collectLogicalPackages	Default is false	Possible values : true or false Import migration monitor is extended with this option for processing “logical” packages. To one standard package corresponds either one STR or one WHR file (for example, SAPAPPL1.STR , REPOSRC-1.WHR). To one “logical” package corresponds either one STR.logical or one WHR.logical file (for example SAPCLU4.STR.logical , SAPCDCLS-1.WHR.logical). The logical packages are located in the same directory where the standard packages are located, for example importDirs/ABAP/DATA . Set this option to true if an import is running on SAP HANA database (HDB) and an export was run with the decluster=true option.

Import Exchange Options

Option	Description	Comment
<code>exchangeDir</code>	Exchange directory	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). If there is an old <code>export_statistics.properties</code> file (for example, from a previous export run), remove this file.

Import Socket Options

Option	Description	Comment
<code>socket</code>	Socket operating mode	-
<code>port</code>	Server port number	Any free port from 1024 to 65535 .

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.

9.1.3 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
```

9.1.4 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
```

9.1.5 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 \[page 186\]](#) 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 \[page 87\]](#).

5. Restart the import.

9.1.6 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 \[page 172\]](#). 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><export_dump_dir>/DATA</code>	Contains the STR files generated by R3ldctl
<code><export_dump_dir>/DB</code>	Contains the DDL<DBTYPE> .TPL files generated by R3ldctl
<code><export_dump_dir>/DB/ <DBTYPE></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 \[page 172\]](#).

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

```

9.1.7 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

```

9.1.8 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

9.1.9 Installing the Target System Using the Migration Monitor

This section describes the steps that you have to perform to install the target system using the migration monitor.

Prerequisites

Make sure there is enough free space on the target system for the database load.

To find out the size of the export and the sizes of the tablespaces or dbspaces that are created, look at the file `DBSIZE.XML` located in the directory `<DRIVE>:\<EXPDIR>\DB\<DATABASE>` (**Windows**) or `<EXPDIR>/DB/<DATABASE>` (**UNIX**).

Procedure

1. If you want to start the installation of the target host using the migration monitor, make sure that at least the dump directory with the following files is accessible on the target host and that it contains the correct data before you start the software provisioning manager:
 - `<Dump_Dir>/LABEL.ASC`
 - `<Dump_Dir>/DB/<DBTYPE>/DBSIZE.XML`
 - **Oracle only:** `<Dump_Dir>/DB/DDLORA.TPL`

If the dump directory is not shared on the target host, copy the files from the source system to the target system as soon as they have been created on the source host using the (export) migration monitor's FTP copy options.

2. Start the software provisioning manager as described in the installation documentation for your SAP component.
3. To install the target system, follow the instructions in the software provisioning manager input dialogs and enter the required parameters as far as the [ABAP System > Database](#) screen. On this screen, choose [Standard System Copy/Migration \(R3load-Based\)](#).
4. Select the [Use migration monitor](#) option.

i Note

If you need more information about input parameters, position the cursor on the field of the respective parameter and press **F1**.

5. When the software provisioning manager displays the [Media Browser](#) window and asks for the [Migration Export \(MIGEXPORT\)](#), enter the path to the export directory **<EXPDIR>**.
6. Continue as described in the installation documentation for your SAP component until a dialog box appears that states:
If the export has been started on the source system and the export monitor is running, you can now start the data load by starting the import monitor.
7. Check that the prerequisites in the dialog box are fulfilled by your system. If so, start the migration monitor.
8. Complete the installation as described in the installation documentation for your SAP solution.

⚠ Caution

If you have to restart the import after an error, just restart the software provisioning manager. The import is continued with the table that was not imported successfully.

9.2 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.

9.3 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 \[page 198\]](#)

[Restrictions \[page 198\]](#)

[Using the Table Comparison Tool \[page 199\]](#)

9.3.1 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 \[page 197\]](#)

9.3.2 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 \[page 197\]](#)

9.3.3 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 \[page 24\]](#) 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 \[page 24\]](#) , 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 \[page 197\]](#)

9.4 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 \[page 202\]](#)

[Starting the Package Splitter \[page 205\]](#)

[Executing the STR Splitter and the WHERE Splitter \[page 207\]](#)

[Output Files \[page 206\]](#)

9.4.1 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
strDirs	List of STR file directories	Separator on Windows: ; Separator on UNIX: :
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">Integer valueMaximum number of tables in the package	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
<code>whereDir</code>	WHERE file directory	Directory with WHR files.
<code>strDirs</code>	List of STR file directories	Separator on Windows: ; Separator on UNIX: :
<code>outputDir</code>	Output directory	If missing, then the directory that contains the corresponding WHR files is used.
<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: all , off , 1 (error), 2 (warning), 3 (info), 4 (config, default), 5 , 6 , 7 (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 \[page 202\]](#)

9.4.2 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 \[page 202\]](#)

9.4.3 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 \[page 202\]](#)

9.4.4 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 \[page 202\]](#)

9.5 IBM Db2 for Linux, UNIX, and Windows Database

[Enabling Recoverability of the IBM Db2 for Linux, UNIX, and Windows Database \[page 208\]](#)

[Deleting a Database Schema Manually \[page 209\]](#)

You can generate and use the following scripts to delete a database schema manually (**not** the complete database). During the manual deletion, you must delete all tables and indexes, modules, views, functions, procedures, variables, and tablespaces belonging to the schema.

[Online Information from IBM \[page 211\]](#)

9.5.1 Enabling Recoverability of the IBM Db2 for Linux, UNIX, and Windows Database

Use

⚠ Caution

This section **only** applies to your database. You only have to perform the steps outlined in this section once — even if you install multiple SAP systems into one database.

Roll forward recovery provides the ability to recover lost data due to media failure, such as hard disk failure, and applies log file information (log journal) against the restored database. These log files contain the changes made to the database since the last backup.

⚠ Caution

A production system **must** run in log retention mode.

If a system is **not** running in log retention mode, all changes applied to the database since the last complete backup are lost in the event of a disk failure.

In log retention mode, the log files remain in the log directory (`log_dir`). To archive the log files, you can use the Db2 log file management solution. For more information, see the *Database Administration Guide for SAP on IBM Db2 for Linux, UNIX, and Windows*.

Procedure

1. Log on to the database server as user `db2<dbsid>`.
2. To activate log retention mode and to specify the log archiving method, you must set configuration parameter `LOGARCHMETH1` to one of the following options:
 - `LOGRETAIN`
No log archiving takes place. Log files remain in the log directory.
 - `DISK:<log_archive_path>`
Log files are archived to a disk location. You can archive them to tape using the Db2 tape manager (`db2tapemgr`) at a later point in time.
 - `TSM:<TSM_management_class>`
Log files are archived to Tivoli Storage Management (TSM)
 - `VENDOR:<path_to_vendor_lib>`
Log files are archived to a library that is provided by your vendor storage management
 - `USEREXIT`
For downward compatibility with the former user exit concept, you can specify value `USEREXIT` for parameter `LOGARCHMETH1`.

To set configuration parameter `LOGARCHMETH1` for your preferred archiving method, enter the following command:

```
db2 update db cfg for <dbsid> using LOGARCHMETH1 <log_archiving_method>
```


For more information, see the *Database Administration Guide for SAP on IBM Db2 for Linux, UNIX, and Windows*.

3. To activate the settings, you must restart the database. The database is now in backup pending mode. You need to take an offline backup before you can continue.
4. To start the offline backup for a single-partitioned database, enter the following command:

```
db2 backup db <dbsid> to <device>
```

❖ Example

For example, to perform an offline backup of database C11 to tapes in devices `rmt0` and `rmt1`, enter the following command:

```
db2 backup database C11 to /dev/rmt0, /dev/rmt1
```

i Note

On a multi partition database, you must activate log retention mode on all database partitions. In addition, you also have to perform an offline backup for all database partitions.

For more information about how to start a Db2 backup, see the IBM Db2 online documentation.

More Information

- For access to the *Database Administration Guide for SAP on IBM Db2 for Linux, UNIX, and Windows* and more documentation about SAP systems on IBM Db2 for Linux, UNIX, and Windows, see [Online Information from SAP \[page 223\]](#).
- For access to online information about Db2 that is provided by IBM, see [Online Information from IBM \[page 211\]](#).

9.5.2 Deleting a Database Schema Manually

You can generate and use the following scripts to delete a database schema manually (**not** the complete database). During the manual deletion, you must delete all tables and indexes, modules, views, functions, procedures, variables, and tablespaces belonging to the schema.

Prerequisites

- Make sure that any instance that uses the schema is stopped.
- The database must be up and running.

Context

You delete a database schema in the following situation: You are running multiple components on one database (MCOD) and you **only** want to delete the database schema of the corresponding component to be deleted.

You also delete a database schema if you want to delete the Java part of an SAP system (ABAP+Java or Java Add-In).

Procedure

1. Log on to the database server as db2<dbsid> and open a command prompt.
2. To delete all tables of the database schema, proceed as follows:
 - a. Enter the following SQL statement to create a script:

```
db2 "SELECT 'DROP TABLE ' || CHR(34) || VARCHAR(tabschema) || CHR(34) ||  
    ' ' || CHR(34) || tablename || CHR(34) || ';' FROM syscat.tables WHERE  
    tabschema='<SAP_SYSTEM_SCHEMA>' AND TYPE in ('T','G') " | grep "DROP" >  
drop_<sap_system_schema>_tables.txt
```

where <SAP_SYSTEM_SCHEMA> is the name of the database schema.

- b. To delete all tables, run this script using the following command:

```
db2 -tvf drop_<sap_system_schema>_tables.txt
```

3. To delete all views of the database schema, proceed as follows:
 - a. Enter the following SQL statement to create a script:

```
db2 " SELECT 'DROP VIEW ' || CHR(34) || VARCHAR(tabschema) || CHR(34) ||  
    ' ' || CHR(34) || tablename || CHR(34) || ';' FROM syscat.tables  
    WHERE tabschema='<SAP_SYSTEM_SCHEMA>' AND TYPE='V' " | grep "DROP" >  
drop_<sap_system_schema>_views.txt
```

where <SAP_SYSTEM_SCHEMA> is the name of the database schema.

- b. To delete all views, run this script using the following command:

```
db2 -tvf drop_<sap_system_schema>_views.txt
```

4. To delete all modules of the database schema, proceed as follows:
 - a. Enter the following SQL statement to create a script:

```
db2 " SELECT 'DROP MODULE ' || CHR(34) || VARCHAR(moduleschema) ||  
    CHR(34) || ' ' || CHR(34) || modulename || CHR(34) || ';' FROM  
    syscat.modules WHERE moduleschema='<SAP_SYSTEM_SCHEMA>' " | grep "DROP" >  
drop_<sap_system_schema>_modules.txt
```

where <SAP_SYSTEM_SCHEMA> is the name of the database schema.

- b. To delete all modules, run this script using the following command:

```
db2 -tvf drop_<sap_system_schema>_modules.txt
```

5. To delete all functions of the database schema, proceed as follows:
 - a. Enter the following SQL statement to create a script:

```
db2 " SELECT 'DROP SPECIFIC FUNCTION ' || CHR(34) || VARCHAR(funcschema)
||CHR(34) || '.' || CHR(34) || specificname || CHR(34) || ';' FROM
syscat.functions WHERE funcschema='<SAP_SYSTEM_SCHEMA>' " | grep "DROP" >
drop_<sap_system_schema>_functions.txt
```

where <SAP_SYSTEM_SCHEMA> is the name of the database schema.

- b. To delete all functions, run this script using the following command:

```
db2 -tvf drop_<sap_system_schema>_functions.txt
```

6. To delete all procedures of the database schema, proceed as follows:

- a. Enter the following SQL statement to create a script:

```
db2 " SELECT 'DROP SPECIFIC PROCEDURE ' || CHR(34) || VARCHAR(routineschema)
||CHR(34) || '.' || CHR(34) || specificname || CHR(34) || ';' FROM
syscat.routines WHERE routineschema='<SAP_SYSTEM_SCHEMA>' " | grep "DROP" >
drop_<sap_system_schema>_procedures.txt
```

where <SAP_SYSTEM_SCHEMA> is the name of the database schema.

- b. To delete all procedures, run this script using the following command:

```
db2 -tvf drop_<sap_system_schema>_procedures.txt
```

7. To delete all variables of the database schema, proceed as follows:

- a. Enter the following SQL statement to create a script:

```
db2 "SELECT 'DROP VARIABLE ' || CHR(34) || VARCHAR(varschema) ||
CHR(34) || '.' || CHR(34) || varname || CHR(34) || ';' FROM
syscat.variables WHERE varschema='<SAP_SYSTEM_SCHEMA>' " | grep "DROP" >
drop_<sap_system_schema>_variables.txt
```

where <SAP_SYSTEM_SCHEMA> is the name of the database schema.

- b. To delete all variables, run this script using the following command:

```
db2 -tvf drop_<sap_system_schema>_variables.txt
```

8. Drop the database schema using the following command:

```
db2 drop schema <SAP_SYSTEM_SCHEMA> restrict
```

9. Delete all tablespaces by performing the following steps:


- a. To see an overview, list all tablespaces using the following command:

```
db2 list tablespaces
```

- b. When you delete the Java part of an SAP system (ABAP+Java or Java Add-In), delete **only** the Java tablespaces, that is <SAPSID>#DBD and <SAPSID>#DBI.
- c. In an ABAP-only or Java-only system, delete all tablespaces starting with <SAPSID>#.
- d. To delete the relevant tablespaces, enter the following command:

```
db2 drop tablespace <tablespace_name>
```

9.5.3 Online Information from IBM

You can use the following IBM documentation landing page as a starting point to all kinds of documentation for your IBM Db2 for Linux, UNIX, and Windows version: <https://www.ibm.com/docs/en/db2> .

The following tables provide direct links to IBM Db2 online documentation and manuals, listed by database version:

IBM Db2 Documentation

Database Version	Internet Address
IBM Db2 11.5	https://www.ibm.com/docs/en/db2/11.5 ➡
IBM Db2 11.1	https://www.ibm.com/docs/en/db2/11.1 ➡
IBM Db2 10.5	https://www.ibm.com/docs/en/db2/10.5 ➡
IBM Db2 10.1	https://www.ibm.com/docs/en/db2/10.1 ➡ (out of mainstream maintenance)
IBM Db2 9.7	https://www.ibm.com/docs/en/db2/9.7 ➡ (out of mainstream maintenance)

IBM Manuals

Database Version	Internet Address
IBM Db2 11.5	https://www.ibm.com/support/pages/node/627743 ➡
IBM Db2 11.1	http://www.ibm.com/support/docview.wss?uid=swg27050624 ➡
IBM Db2 10.5	http://www.ibm.com/support/docview.wss?uid=swg27038855 ➡
IBM Db2 10.1	http://www.ibm.com/support/docview.wss?uid=swg27024478 ➡ (out of mainstream maintenance)
IBM Db2 9.7	http://www.ibm.com/support/docview.wss?rs=71&uid=swg27015148 ➡ (out of mainstream maintenance)

9.6 Oracle Database

[Support of Oracle Transparent Data Encryption \(Oracle TDE\) \[page 213\]](#)

Oracle Transparent Data Encryption (TDE) for Oracle 18c is supported as of software provisioning manager 1.0 SP27 for SAP systems based on SAP NetWeaver.

[Database Instance Installation on Oracle Automatic Storage Management \[page 215\]](#)

[Installing Oracle Real Application Clusters on your Target System \[page 216\]](#)

You want to install your target system with Oracle Real Application Clusters (RAC) using the software provisioning manager in an SAP environment. This section provides additional information for the RAC installation using the Software Provisioning Manager.

[Additional Information about the OraBRCopy Tool \[page 219\]](#)

9.6.1 Support of Oracle Transparent Data Encryption (Oracle TDE)

Oracle Transparent Data Encryption (TDE) for Oracle 18c is supported as of software provisioning manager 1.0 SP27 for SAP systems based on SAP NetWeaver.

Prerequisites

- Oracle database 18c or higher
- software provisioning manager 1.0 SP 27 or higher
- SAP system is based on SAP NetWeaver 7.0 or higher
- If you perform a system copy or a database refresh with `R3load`, the Oracle database on the target system does not need to have the same encryption type as the Oracle database on the source system. You can always change the encryption type when the Oracle database or the Oracle tablespaces are recreated, and the data are reloaded again in the Oracle database by `R3load`.

Constraints

- Oracle Database 18c only supports TDE tablespace encryption, but not yet TDE full database encryption. For more information, see SAP Note [2485122](#).
- With the software provisioning manager 1.0 you cannot configure TDE and encrypt tablespaces in the database of an already existing SAP System. You have to do this manually.
 - You can manually configure TDE in an SAP system that already exists.
 - You can manually convert a non-encrypted Oracle SAP database into an encrypted Oracle SAP database.
- With the software provisioning manager 1.0 you cannot deconfigure TDE and decrypt the data in the database of an existing SAP system. You have to do this manually.

For more information, see SAP Note [2485122](#).

Supported Software Provisioning Manager 1.0 Scenarios

- SAP system installation from scratch
See section *Support of Oracle Transparent Data Encryption (Oracle TDE)* in the [installation guide \[page 24\]](#).
- SAP system copy
When you copy an SAP system with the software provisioning manager 1.0, there are two options for copying the database. From a security perspective, the first option is the preferred option as the SAP data remains security encrypted during the whole system copy process.
 - **Option 1: Backup / Restore**
The software provisioning manager 1.0 creates a new encrypted database by restoring an encrypted database backup. The data remains encrypted during the whole process.

- **Option 2: Export / Import with R3load, or Oracle Data Pump**

The software provisioning manager 1.0 (1) unloads the SAP application data with R3load to SAP export dump files, (2) creates a new encrypted database, (3) loads the SAP export dump files and then (4) deletes the SAP export dump files. The data in the SAP export dump files is not encrypted with Oracle TDE.

Exporting SAP data with R3load.

Oracle TDE encrypts SAP application data that is stored inside the Oracle database. When the data is written to Oracle database files, online redo log files or archive files, the data is encrypted. Oracle TDE is only effective and protects your SAP application data as long as you keep it inside the Oracle database.

When you export SAP application data with Oracle data pump into encrypted Oracle data pump export files, the data remains encrypted. This method allows you to safely export/import Oracle data from one Oracle database to another Oracle database.


Whenever you export SAP application data with R3load from the Oracle database into R3load dump files, the SAP application data is not encrypted and not protected any more by Oracle Transparent Data Encryption.

Exporting SAP Data with Oracle Data Pump

To perform import or export operations with Oracle tools, you must use Oracle Data Pump.


For more information, see [2485122](#) .

- SAP system rename

See section *Support of Oracle Transparent Data Encryption (Oracle TDE)* in the system rename guides at <https://support.sap.com/sltoolset>  **►► System Provisioning ► Rename a System using Software Provisioning Manager ► System Rename Option of Software Provisioning Manager 1.0 ►**

- SAP system database refresh

[Copying the Database Only - Refresh Database Content on Oracle Database \[page 140\]](#)

For more information, see SAP Note [2485122](#) .

Supported Oracle 18c Configuration Scenarios

- Oracle single instance installation

Software keystore is located in filesystem

- Real Application Clusters (RAC)

See section *Installing Oracle Real Application Clusters* in the [installation guide \[page 24\]](#).

Software keystore is shared (in ASM or shared filesystem)

- Automatic Storage Management (ASM)

See section *Database Instance Installation on Oracle Automatic Storage Management* in the [installation guide \[page 24\]](#).

Software keystore is located in ASM

- CDB architecture (Singletenant, Multitenant)


See section *Multitenant Database Installation of Oracle Database 12c or Higher* in the [installation guide \[page 24\]](#).

Only united mode software keystore is supported.

- Oracle Database Vault

SAP Note [2218115](#) 

Oracle TDE and Oracle DV can be combined together.

For more information, see SAP Note [2485122](#) .

Supported TDE Encryption Algorithms

- The software provisioning manager 1.0 allows you to choose which encryption key to use.
- Default Encryption is TDE or AES128.
- NOTDE is the value for No Transparent Data Encryption.
- Currently only user tablespaces can be encrypted.
- Tablespaces `System`, `Psaptemp`, and `Sysaux` are not supported.

Log und SQ files in installation directory for TDE

During the installation, Database Refresh and Systemcopy with `R3load` with the software provisioning manager 1.0 the TDE will be set and installed when the [Install Oracle TDE](#) checkbox is marked.

For a database rename, the wallet is already available with the same master key as before. Only the Auto Login Wallet will be reset. The following log and sql files are created in the installation directory for TDE.

- CreateKeystore.log & CreateKeystore.sql
 - Create keystore log and sql file
 - During the installation or system copy the keystore is created in `$SAPDATA_HOME/orawallet/tde`
- CreateKSKey.log & CreateKSKey.sql
 - Create keystore key log and sql file
 - The Master Key is written to the keystore file `ewallet.p12` and a backup file `ewallet_<number>.p12` is created as well.
- CreateKSAutologin.log & CreateKSAutologin.sql
 - Create keystore auto login log and sql file
 - During startup the wallet will be open automatically. The Auto Login Wallet file is `cwallet.sso` in the keystore.

9.6.2 Database Instance Installation on Oracle Automatic Storage Management

This section provides information on the installation of a database instance on an Oracle Automatic Storage Management (ASM).

Software provisioning manager performs the following steps that differ from the general installation on non-ASM systems:

- It creates the `oracle` user and the additional Oracle groups `oinstall`, `asmdba`, `asmadmin`, and `asmoper`.
- It installs the correct user environment for the `oracle` and `<sapsid>adm` users.

Prerequisites

- You must have installed the Oracle GRID software. This software ensures that ASM can be used.
- You must have created the following Oracle disk groups:
 - +DATA, +<DBNAME>_DATA or +DATA_<DBMACHINE_NAME> for all data files, online redo logs (first copy), and control file (first copy).
 - +ARCH, +<DBNAME>_ARCH for control file (second copy) and archive redo logs (not for engineered systems such as Exadata or SuperCluster).
 - +RECO, +<DBNAME>_RECO or +RECO_<DBMACHINE_NAME> for control file (third copy), online redo log (second copy), RMAN backups and fast recovery area.
 - +OLOG, + MLOG for redo log file are optional for larger systems (not for engineered systems such as Exadata or SuperCluster).

More Information

For more information, see [SAP on Oracle Automatic Storage Management \(ASM\)](#) .

9.6.3 Installing Oracle Real Application Clusters on your Target System

You want to install your target system with Oracle Real Application Clusters (RAC) using the software provisioning manager in an SAP environment. This section provides additional information for the RAC installation using the Software Provisioning Manager.

Prerequisites

❖ Example

As an example, this section describes the installation steps for RAC on your target system using the following installation parameters:

- DB_SID=C11
- default ASM data diskgroup=+DATA
- database hostnames (three node cluster)=vhost1,vhost2,vhost3
- three-digit threads=001,002,003 (it is also possible to have single-digit threads=1,2,3)

During the target system installation, the software provisioning manager executes the Oracle executable `$ORACLE_HOME/bin/srvctl` to create the `<DBSID>` cluster database (add database) and adds three instances (add instance) on the different hosts. While the database is being loaded, the cluster is disabled (disable database).

- When the database installation, database load and also additional steps like `update statistics`, setting database users and creating secure store have all finished, the software provisioning manager sets the database to cluster mode (`cluster_database=true`) and enables the cluster database (`enable database`).

You can find all these commands in the software provisioning manager log files `sapinst_dev*.log` in the installation directory (default: `/tmp/sapinst_instldir`):

❖ Example

```
/oracle/C11/<release-specific folder name>/bin/srvctl add database -d C11 -o
/oracle/C11/<release-specific folder name> -p +DATA/C11/spfileC11.ora -a DATA
/oracle/C11/<release-specific folder name>/bin/srvctl add instance -d C11 -i
C11001 -n vhost1

/oracle/C11/<release-specific folder name>/bin/srvctl add instance -d C11 -i
C11002 -n vhost2

/oracle/C11/<release-specific folder name>/bin/srvctl add instance -d C11 -i
C11003 -n vhost3

/oracle/C11/<release-specific folder name>/bin/srvctl disable database -d C11

sqlplus "/ as sysdba"

ALTER SYSTEM SET CLUSTER_DATABASE=true

exit



/oracle/C11/<release-specific folder name>/bin/srvctl enable database -d C11
```

- When the database installation has finished and the software provisioning manager has stopped, you can check the database status as Oracle user or `<sapsid>adm` user with the following command:

Oracle 11: `srvctl status database -d C11`

Oracle 12 and higher: `srvctl status database -db C11`

Context

For additional information about how set up SAP systems to use Oracle Real Application Clusters (RACs), see the whitepapers at <https://www.sap.com/community/topic/oracle.html>  *SAP on Oracle Real Application Clusters (RAC)* 

These whitepapers describe all required changes to the Oracle database, Oracle network configuration, Oracle instance parameters, and so. However, they do not contain information about RAC installation with the software provisioning manager.

Procedure

- You can then start the database on all nodes with the following command:

Oracle 12 and higher: `srvctl start database -db C11`

The software provisioning manager does not start the database on all nodes after the installation has finished. Only the first database RAC node is started.

You need to start all other instances manually after completing the preparation on the other database nodes. In addition, when the installation is finished, the `<sapsid>adm` environment variable `ORACLE_SID` is set to `C11001` on the first node.

2. You prepare all other database instances as described in the following:

After completing the installation of the first RAC database node, you need to prepare all other database nodes with the software provisioning manager. These installation preparation steps create the required operating system users and groups and also install the required kernel files like `dba*tools` and SAP Host Agent.

You can find this option on the [Welcome](#) screen of the software provisioning manager at: ► [Generic Installation Option](#) ► [Oracle](#) ► [Database tools](#) ► [RAC/ASM/Exadata Database Instance Preparation - Kernel <Version>](#) ►

3. You install the primary application server instance and the additional application server instances:

For the RAC installation, the software provisioning manager performs some additional steps during the installation of the additional application server instance so that the application server of the additional application server instance can connect to the cluster nodes. For this the software provisioning manager updates the `tnsnames.ora` file with some additional RAC-specific entries.

The software provisioning manager modifies `tnsname.ora` like in the following example:

```
C11.WORLD
C11001.WORLD, C11002.WORLD, C11003.WORLD
C11_DVEBMGS01.WORLD
C11_D02.WORLD
```

The software provisioning manager modifies SAP instance or start profiles like in the following example, where `<xx>` is a free sequence number in the instance profile or start profile:

```
SETENV_XX = dbs_ora_tnsname=C11_DVEBMGS01
SETENV_XX = dbs_ora_tnsname=C11_D02
```

During the installation of the additional application server instance, the software provisioning manager tries to restart the instance but this fails because the RAC services are not registered at the cluster ware. To register the RAC services, the software provisioning manager creates the required commands in a shell script in the local installation directory.

You need to execute these shell scripts on one node of the cluster database as follows:

1. Log on to the database server as the `Oracle` user.
2. Set the Oracle environment to the home directory of the RDBMS using the following command:
`setenv ORACLE_HOME /oracle/C11/<release-specific folder name>`
3. Run the shell script using the following command:
`call <Path_Of_Shell_Script>/C11_DVEBMGS01.sh`

❖ Example

Entries of the shell script:

```
srvctl add service -d C11 -s C11_DVEBMGS01 -r C11001 -a C11002,C11003 -P  
BASIC -y AUTOMATIC -q true -j long -e SELECT -m BASIC -z 3 -w 5  
  
srvctl start service -d C11 -s C11_DVEBMGS01
```

Entries of shell script for the additional application server instance server C11_D02.sh:

```
srvctl add service -d C11 -s C11_D02 -r C11002 -a C11001,C11003 -P BASIC -y  
AUTOMATIC -q true -j long -e SELECT -m BASIC -z 3 -w 5  
  
srvctl start service -d C11 -s C11_D02
```

Oracle 12 and higher:

Entries of the shell script:

```
srvctl add service -db C11 -service C11_DVEBMGS01 -preferred C11001  
-available C11002,C11003 -tafpolicy BASIC -policy AUTOMATIC -notification  
true -failovertype SELECT -failovermethod BASIC -failoverretry 3  
-failoverdelay 5  
srvctl start service -db C11 -service C11_DVEBMGS01
```

Entries of shell script for the additional application server instance server C11_D02.sh:

```
srvctl add service -db C11 -service C11_D02 -preferred C11002 -available  
C11001,C11003 -tafpolicy BASIC -policy AUTOMATIC -notification true  
-faileovertype SELECT -faileovermethod BASIC -faileoverretry 3 -failoverdelay  
5  
  
srvctl start service -db C11 -service C11_D02
```

After you have executed these commands on the database server, the installation of the additional application server instance can continue. Now you can start the instance without connection problems.

4. You start the additional application server instance instance.

9.6.4 Additional Information about the “OraBRCopy” Tool

Related Information

[Configuration \[page 220\]](#)

[Output Files \[page 222\]](#)

9.6.4.1 Configuration

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`

Application Options

Name	Description	Comment
<code>oracleHome</code>	Oracle home directory	Determined automatically in script/ batch files from the <code>ORACLE_HOME</code> environment variable
<code>sourceSid</code>	Source database SID	Determined automatically in script/ batch files from the <code>ORACLE_SID</code> environment variable
<code>targetSid</code>	Target database SID	
<code>listenerPort</code>	Listener port number	Mutually exclusive with <code>tnsAlias</code> . Can be found in the <code>listener.ora</code> file of the source database.
<code>tnsAlias</code>	Oracle TNS alias	Mutually exclusive with <code>listenerPort</code> . Can be found in the <code>tnsnames.ora</code> file of the source database.
<code>password</code>	Password of SYSTEM database user	
<code>generateFiles</code>		Generates control/trace and <code>init<TARGET_DBSID>.ora</code> files.

Name	Description	Comment
<code>forceLogSwitches</code>		Forces log switches. If this option is specified then Oracle database will be stopped during the tool execution. 3

Additional Options

Name	Description	Comment
<code>bg</code>	Enables background mode	<div> i Note Takes effect only as command line option. </div> <p>If the tool is running in the background mode, the UNIX shell window or Windows command prompt can be closed after startup.</p>
<code>secure</code>	Enables secure mode	<div> i Note Takes effect only as command line option. </div> <p>If the tool is running in the secure mode, command line parameters (ex. passwords) will be hidden for java process. The secure mode implicitly enables background mode.</p>
<code>trace</code>	Trace level	Possible values: all, off, 1 (error), 2 (warning), 3 (info), 4 (config, default), 5, 6, 7 (trace)

Mandatory Options

- Generate files mode
`generateFiles`, `targetSid`, `password`, `listenerPort` or `tnsAlias`
- Force log switches mode
`forceLogSwitches`, `password`, `listenerPort` or `tnsAlias` 4

9.6.4.2 Output Files

- CONTROL.SQL
- CONTROL.TRC
- init<TARGET_DBSID>.ora
- ora_br_copy.log
- OraBRCopy.console.log

9.7 SAP Adaptive Server Enterprise Database

During installation of the target system, a significant amount of time is spent for database content import, index creation and index statistics generation.

The duration of loading the database content depends on

- the amount of data to import into the database
- the number of parallel import processes
- active database engines
- database cache sizes
- available physical memory
- the throughput of the I/O subsystem
- configured import features like index and statistics creation after table content load with several parallel consumers
- available CPU resources
- the number of import packages working on the same database table
- other applications running on the same host consuming CPU and memory

The standard import procedure includes a two step approach:

- Load the data into the database and create indexes
- Update statistics after the data is loaded

For system copies of SAP NetWeaver ABAP with R3load and SAP Adaptive Server Enterprise (SAP ASE) database release of 16 SP03 or higher it is possible to combine these two steps with the result of a reduced duration of the complete import phase. The software provisioning manager 1.0 is able to adapt the templates of the migration monitor in a way that index statistics are generated during table data import and index creation in a parallel way.

With that approach it is not necessary to perform a separate “update statistics” step.

Configuration of the parallelization of the database content import

Tuning the duration of the database content import is done by configuring the number of parallel import processes (R3load) and the number of parallel worker processes in the SAP ASE database server for index

creation and statistic updates. The software provisioning manager 1.0 offers dialog screens to enter the following parameters:

- SAP System Database Import
 - Number of Parallel Jobs
- SAP ASE Database System Parameters
 - Level of Parallelism
 - Number of consumers used by the `create index with consumers` command
 - Maximum number of worker processes allowed per query used by the `create index with consumers` and `update stats with consumers` commands
- SAP ASE Database Statistics
 - Number of Parallel Jobs


The number of indexes created in parallel is defined by the number of R3load jobs configured for the migration monitor.



The number of indexes that can potentially be created in parallel is calculated based on the number of worker processes divided by the number of threads per index creation (number of indexes that can potentially be created in parallel = number of worker processes / number of threads per index creation).

The software provisioning manager is using default values that may fit for most cases. Finding the “best fit” configuration especially for migrations is an interactive process because it depends on the current environment and the data to import.

9.8 Online Information from SAP

More information is available online as follows:

Titel	Internet Address
Overview page: Central access to all guides for SAP on IBM Db2	https://help.sap.com/viewer/p/DB6
SAP on Db2 for Linux, UNIX, and Windows Community	https://community.sap.com/topics/db2-for-linux-unix-windows 
<i>Running an SAP System on IBM Db2 with the Db2 pureScale Feature</i>	IBM Db2 11.5: https://help.sap.com/docs/r/db6_purescale_11_5 IBM Db2 11.1: https://help.sap.com/viewer/db6_purescale_11_1 IBM Db2 10.5: https://help.sap.com/viewer/db6_purescale_10_5 IBM Db2 10.1: https://help.sap.com/viewer/db6_purescale_10_1 (out of mainstream maintenance)
<i>IBM Db2 High Availability Solution: IBM Tivoli System Automation for Multiplatforms</i>	https://help.sap.com/viewer/db6_samp

Titel	Internet Address
<i>Database Administration Guide for SAP on IBM Db2 for Linux, UNIX, and Windows</i>	https://help.sap.com/viewer/db6_admin
<i>Database Administration Using the DBA Cockpit: IBM DB2 for Linux, UNIX, and Windows</i>	https://help.sap.com/viewer/db6_dbacockpit (English) https://help.sap.com/viewer/db6_dbacockpit_de (German)
<i>SAP Business Warehouse on IBM Db2 for Linux, UNIX, and Windows: Administration Tasks</i>	Db2 10.5 and higher: https://help.sap.com/viewer/db6_bw Db2 10.1 and lower: https://help.sap.com/viewer/db6_bw_10_1 (out of mainstream maintenance)
<i>Enabling SAP Business Warehouse Systems to Use IBM Db2 for Linux, UNIX, and Windows as Near-Line Storage (NLS)</i>	https://help.sap.com/viewer/db6_nls
<i>Database Administration Guide for SAP on IBM Db2 for z/OS</i>	https://help.sap.com/viewer/db2_administration_guide
<i>Planning Guide for SAP on IBM Db2 for z/OS</i>	https://help.sap.com/viewer/db2_planning_guide
<i>SAP Security Guide for SAP on IBM Db2 for z/OS</i>	https://help.sap.com/viewer/db2_security_guide
<i>SAP on Db2 for z/OS Community</i>	https://www.sap.com/community/topic/db2-for-zos.html 
<i>TLS with Client Certificate Authentication for SAP Application Server Connections to Db2 on IBM Z</i>	https://www.sap.com/documents/2020/10/90ca5a5f-b37d-0010-87a3-c30de2ffd8ff.html 
<i>Database Administration Guide: SAP Applications on SAP Adaptive Server Enterprise</i>	https://help.sap.com/viewer/ase_admin
<i>Security Guide for SAP Application on SAP Adaptive Server Enterprise</i>	https://help.sap.com/viewer/ase_security

9.9 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).

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.

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">• 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	<p>▶ Application Help ▶ Function-Oriented View ▶ Solution Life Cycle Management ▶ SAP Management Console ▶</p>

- 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">• 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	<p>► Application Help ► Function-Oriented View ► Solution Life Cycle Management ► SAP Microsoft Management Console: Windows</p>

Only valid for 'Platform': Linux

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 \[page 228\]](#)). 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.

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.

9.10 Starting and Stopping SAP System Instances Using Commands

Prerequisites

You are logged on to the SAP system host as user `<sapsid>adm`.

Context

i 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 \[page 224\]](#)). 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.

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