Operations Guide **PUBLIC**

Software Provisioning Manager 1.0 SP22
Document Version: 2.7 – 2018-01-15

System Copy for SAP Systems Based on the Application Server Java of SAP NetWeaver 7.0 to 7.03 on Windows

Content

Document History

> **Note**
>
> Before you start the implementation, make sure you have the latest version of this document, which is available at https://support.sap.com/sltoolset *System Provisioning* *System Copy Option of Software Provisioning Manager* .

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

Version	Date	Description

2.7	2018-01-15	Updated version for Software Provisioning Manager 1.0 SP22 (SL Toolset 1.0 SP22)
		• New Features:
		  ○ Installer Log Files Improvements, documented in: *New Features*, *Useful Information about the Installer*, *Troubleshooting with the Installer*
		• *New Features* 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 Common GUI - has been deprecated with SP22. As of SP22, SL Common GUI is the only available installer GUI :
		  ○ The following sections which were explicitely related to Java SDT GUI were completely removed from this documentation: *Performing a Remote Installation Remote Processing of the Installer (Java SDT GUI only)*, *Starting the Java SDT GUI Separately*, *Running the Installer in Accessibility Mode* (general accessibility information was moved to *Useful Information About the Installer*).
		  ○ The Java SDT GUI-specific information was removed from the common installer sections: *Running the Installer*, *Useful Information About the Installer*, *Interrupted Processing of the Installer*, *Troubleshooting with the Installer*
		• New section *Using the Step State Editor (SAP Support Experts Only)*

Version	Date	Description
		added to section *Additional Information About the Installer*.
2.6	2017-09-11	Updated version for Software Provisioning Manager 1.0 SP21 (SL Toolset 1.0 SP21) • New Features: ○ Media Signature Check, documented in: *New Features*, *Running the Installer*, *Preparing the Media Required for Performing the Export* . ○ Support of Oracle 12.2., documented in: *New Features* ○ Support of Oracle Database Vault, documented in: *New Features*.
2.5	2017-05-22	Updated version for Software Provisioning Manager 1.0 SP20 (SL Toolset 1.0 SP20)
2.4	2017-02-06	Updated version for Software Provisioning Manager 1.0 SP19 (SL Toolset 1.0 SP19)
2.3	2016-10-07	Updated version for Software Provisioning Manager 1.0 SP18 (SL Toolset 1.0 SP18)
2.2	2016-06-06	Updated version for Software Provisioning Manager 1.0 SP17 (SL Toolset 1.0 SP17)
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)

Version	Date	Description
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 Introduction

1.1 Homogeneous and Heterogeneous System Copy

This document describes how to perform a homogeneous or heterogeneous system copy of an SAP system based on SAP NetWeaver 7.0 (including Enhancement Packages) Java with source operating system **Windows** , using Software Provisioning Manager 1.0 SP22 (“installer” for short), which is part of SL Toolset 1.0 SP22.

> **Note**
>
> SAP NetWeaver 7.0x Application Server **Java** reached end of maintenance by the end of 2017. SAP recommends upgrading to a more recent version. For more information, see SAP Notes 1648480 and 2595196.

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 ASE

You can use either database-specific methods or database-independent methods.

For a detailed list of SAP system products and releases covered by this guide, see SAP Note 2595196. For information about supported operating system and database platforms, see the Product Availability Matrix at http://support.sap.com/pam.

> **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 Virtualization Management. For more information, see SAP Note 1709155 and https://help.sap.com/lama.

1.2 Naming Conventions

- *Software Provisioning Manager 1.0*
  Software provisioning manager is the successor of the product- and release-specific delivery of provisioning tools, such as SAPinst. Before you perform an installation or system copy, we recommend that you always download the latest version of the software provisioning manager, which is part of the Software Logistics Toolset (“SL Toolset” for short). This way, you automatically get the latest SAPinst

version including latest fixes in the tool and supported processes. For more information about software provisioning manager as well as products and releases supported by it, see **SAP Note** 1680045. `SAPinst` has therefore been renamed to `software provisioning manager 1.0` (“installer” for short) in this documentation. However, the term “SAPinst” is still used in:

  - Texts and screen elements in the software provisioning manager (“installer”) GUI
  - Naming of executables, for example `sapinst`
  - Naming of command line parameters, for example `SAPINST_USE_HOSTNAME`
  - Operating system user groups, for example additional group `sapinst`

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

- *System Copy*
  Duplication of an SAP system. The SAP system ID and certain other SAP parameters might be changed in a copy. When you perform a system copy, the tool installs all the instances again, but it uses a copy of the source system database to set up the database.
  The following use cases are possible:
  - *Initial System Copy*
    The tool newly installs all the instances of a source system, but it uses a copy of the source system database to set up the database in the target system.
  - *Refresh*
    Overwriting of an already existing target system with the database content from a source system. The refresh use case is not supported using the software provisioning manager.
- *Homogeneous System Copy*
  During the system copy, you use the same operating system and database platform as the original system.
- *Heterogeneous System Copy*
  During the system copy, you change either the operating system or the database system, or both. Heterogeneous system copy is a synonym for migration.
- *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.
- *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
`<SAPSID>`	SAP system ID
`<S_HOST>`	System name of the source host (command `hostname`)
`<T_HOST>`	System name of the target host (command `hostname`)
`<S_SAPSID>`	SAP system ID `<SAPSID>` of the source system

Placeholder	Meaning
<T_SAPSID>	SAP system ID <SAPSID> of the target system
<S_DBSID>	Database ID <DBSID> of the source system
<T_DBSID>	Database ID <DBSID> of the target system
<OS>	Operating system name within a path
<DB>	Database name within a path
<Technology>	ABAP, Java, or ABAP+Java

> **Note**
>
> Database ID <DBSID> identifies the database instance. The installer prompts you for the <DBSID> when you are installing the database instance.
>
> The <DBSID> can be the same as the <SAPSID>.

1.3 New Features

The sections below provide an overview of the new features in Software Provisioning Manager 1.0 (the“ installer” for short).

Make sure that you also read the *Release Notes* for your SAP product at https://help.sap.com > <Search your SAP Product> > <Select your SAP Product Version> > *What's New* .

Feature	Description	Availability
Installer Log Files Improvements	Installer log files are now available immediately after the installer has been started, that is **before** a product has been selected on the *Welcome* screen. For more information, see Useful Information About the Installer [page 42] and Troubleshooting with the Installer [page 46].	Software Provisioning Manager 1.0 SP22 (SL Toolset 1.0 SP22)
Media Signature Check	The signature of media is checked **automatically** by the installer during the *Define Parameters* phase while processing the *Media Browser* screens. As of now the installer only accepts media whose signature has been checked. See also the description of this new security feature in SAP Note 2393060. For more information, see Preparing the Media Required for Performing the Export [page 30] and Running the Installer [page 38].	Software Provisioning Manager 1.0 SP21 (SL Toolset 1.0 SP21)

Feature	Description	Availability
Support of Oracle Database Vault	**Caution** Although Oracle Database Vault is already available in the installer and documented in this guide, it is not yet released to customers until further notice. For more information, see the *Current Restrictions* section in SAP Note 1680045. Oracle Database Vault 12c has been certified for SAP products that are based on SAP NetWeaver technology. You can now copy an SAP system with Oracle Database 12c and configure Oracle Database Vault in the database of the target system. Oracle Database Vault is supported for all system copy methods [page 18] described in this documentation. For more information, see Implementing Oracle Database Vault with the Installer [page 135].	Software Provisioning Manager 1.0 SP21 (SL Toolset 1.0 SP21)
Support of Oracle 12.2	Software Provisioning Manager (the "installer") now supports system copy for SAP systems with Oracle 12.2.	Software Provisioning Manager 1.0 SP21 (SL Toolset 1.0 SP21)
SL Common GUI with SAPINST 7.49	With the new installer framework version SAPINST 7.49, you can now use the new SAPUI5-based graphical user interface (GUI) "SL Common GUI". For more information, see Useful Information About the Installer [page 42], Running the Installer [page 38].	Software Provisioning Manager 1.0 SP20 (SL Toolset 1.0 SP20)
Verification of Integrity of Data Units in Software Provisioning Manager	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 31]. In addition, check SAP Note 1680045 whether additional information is available.	Software Provisioning Manager 1.0 SP19 (SL Toolset 1.0 SP19)
Adjust instanceID of an SAP Java System	An inconsistency of the `instanceID` parameter is caused by using an unsupported procedure to create or maintain the system. When `instanceID` is not consistent, future running of software logistscs scenarios, such as system copy, system rename, dual-stack split, upgrade, and so on might fail. The option *Adjust instanceID for a Java System* helps you to overcome this. It is available in Software Provisioning Manager as option *Software Life-Cycle Options* > *Additional Preparation Options* > *Adjust instanceID for a Java System*. For more information, see Verifying and Adjusting the instanceID of an AS Java Instance [page 141].	Software Provisioning Manager 1.0 SP10 (SL Toolset 1.0 SP16)

Feature	Description	Availability
Diagnostics Agent	The Diagnostics Agent is no longer installed automatically with the SAP system. The *Install Diagnostics Agent* check box on the *Install Diagnostics Agent* screen is no longer available. You now have to install the Diagnostics Agent always separately. We recommend that you install it prior to the installation of your SAP system(s). For more information, see the Diagnostics Agent Installation Strategy attached to SAP Note 1365123, to SAP Note 1833501, and to SAP Note 1858920 and the attached *Diagnostics Agent Setup Guide*.	Software Provisioning Manager 1.0 SP10 (SL Toolset 1.0 SP16)
Executing `R3szchk` in Parallel	**Oracle, IBM Db2 for z/OS:** You can now execute `R3szchk` in parallel. Using this feature you can improve the runtime of the export.	Software Provisioning Manager 1.0 SP08 (SL Toolset 1.0 SP13)
Support of Oracle 12 database	You can now perform all Software Provisioning Manager 1.0 tasks (installation, system copy, system rename, dual-stack split) for SAP systems with the Oracle 12 database. For more information, see http://support.sap.com/pam.	Software Provisioning Manager 1.0 SP08 (SL Toolset 1.0 SP13)
Feedback Evaluation Form available in the Software Provisioning Manager:	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. Port 4239 is used for displaying the feedback evaluation form. For more information, see the *Prerequisites* section in Running the Installer [page 38].	Software Provisioning Manager 1.0 SP07 (SL Toolset 1.0 SP12)

1.4 Accessing the SAP Library

The references to the **SAP NetWeaver Library** documentation in this guide always refer to the following on the SAP Help Portal:

- **SAP NetWeaver 7.0:**
  http://help.sap.com/nw70 ▶ *Application Help* ▶ *SAP NetWeaver by Key Capability*
- **SAP NetWeaver 7.0 including Enhancement Package 1:**
  http://help.sap.com/nw701 ▶ *Application Help* ▶ *SAP NetWeaver by Key Capability*
- **SAP NetWeaver 7.0 including Enhancement Package 2:**
  http://help.sap.com/nw702 ▶ *Application Help* ▶ *SAP NetWeaver by Key Capability*
- **SAP NetWeaver 7.0 including Enhancement Package 3:**
  http://help.sap.com/nw703 ▶ *Application Help* ▶ *SAP NetWeaver by Key Capability*

1.5 Constraints

- Only perform a system copy if you have experience in copying systems and thorough knowledge of the operating system, the database, and the Java 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.
- The target system installation consists of both the target database and target instance/application server installations. For the scenarios below, the following holds:
  - Refreshing the database is **not supported**. Refreshing the database means that only the database is loaded with the content of a database of a different system. Since no migration controller is invoked in this scenario, this is not supported.
  - Option *Generic Installation Options* > *Refresh Database Content* is **not supported** for Java systems.
  - Copying only the database is not supported.
  - Copying only the central instance of a system having dialog instances - that means the dialog instances are preserved in the target system - is **not supported**. The migration controller deletes all dialog instances in the database, so the system is not complete any longer.
    Make sure that the export is consistent with the database. For example, the system must not be online during the period between when you start exporting the source central instance and when you install the target central instance.
  - Reinstalling the central instance using option *Central Instance* in the *Target System Installation* folder without the database is not supported . The migration controller deletes all dialog instances in the database, so the system is not complete any longer.
    This might even cause additional problems. For more information, see SAP Note 966752.
- **IBM Db2 for Linux, UNIX, and Windows only:**
  - The option *Deferred Table Creation* is **not supported** for load-based system copies for SAP systems that are not based on SAP NetWeaver 7.0 EHP 1 or higher.
- 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.
- When you perform a system copy, all software units or usage types in the source system are copied to the target system. This means that none of the usage types in the target system can be excluded from the system copy, nor can you select usage types.
- **SAP Solution Manager only:**As of Support Release 4, your SAP Solution Manager 7.0 system must be a dual-stack system if you want to perform a system copy. If required, install a Java Add-In to your existing ABAP system **before** you start the export.
- 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 the following:
  - 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.
  - How to copy data from non-SAP systems to SAP systems based on SAP NetWeaver Application Server. This documentation only describes how to copy data from one SAP system to another SAP system.
  - How to perform a duplication of a SAP system on the same host without changing the SAP system ID.

- How to perform a system refresh using the tool.

- 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.
- For the development of Java applications, we strongly recommend that you follow the rules mentioned below. Otherwise, we cannot guarantee that you can copy your Java engine later with the SAP tools to change your underlying operating system and/or database system.
- SAP does not support all data archiving operations after a system copy.
  If you used data archiving in the source or target system, access to the created archive files from the target system may not always be possible. For more information, see **SAP Note** 153433 and *Data Management Landscape & Transformation Solutions*https://support.sap.com/dm&lt.
  Access to archived files from the target system without a dedicated archive migration project is only supported in the following cases:
  - The system copy is done to provide a source system for nonproductive purposes, for read-only access to the previously archived data from the target system (no reloading), and you do not store archive files using ArchiveLink/CMS.
    You can either copy all archive files to file systems that are not shared between the source and the target system, or you arrange network access for appropriate archive file sharing.
  - The system copy is done to replace a productive system with a new productive system (for example, hardware migration), assuming that the target system did not exist before and the operation of the source system is discontinued after the system copy.
    You **must not** change the system ID during system copy, but arrange for file access and/or ArchiveLink/CMS connectivity.

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

  In all other cases, contact *Data Management Landscape & Transformation Solutions* at https://support.sap.com/dm&lt or `sap_dmlt_gce@sap.com`.
- Dos and Don'ts for system copy:
  - **Do:**
    - Save configuration data and runtime data in the Java database only. If saving this data to the file system level is unavoidable, you must use the Software Deployment Manager (SDM) to save the data.
    - 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 SystemID and SID (SAPSID=SID=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.
  - Try to copy the Java part of an ABAP+Java system to a Java standalone system or vice versa.
- If you have implemented a federated portal network (FPN) across multiple SAP NetWeaver systems, see **SAP Note** 1080080 before starting the system copy.

2 Planning

This section describes how to plan your system copy.

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 documentation that is referenced in the following:
  - 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*

    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 49], but refers for all steps that are identical with a new system installation to the appropriate operating system and database-specific installation guide available at http://support.sap.com/sltoolset ▶ *System Provisioning* ▶ *Installation Option of Software Provisioning Manager*.
  - *SAP System Copy & 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* 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 encounter 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 SAPSIDs).
- 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.

  > **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.

2.3 System Copy Methods

You can choose between the following system copy methods:

- 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 33].
- 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 53].

These methods are not supported for **all** database systems. Refer to the following table to check which copy methods are available for your database system:

Database	Available Methods
SAP MaxDB	Use one of the following: • System copy procedure on Windows using Jload For more information, see System Copy Procedure [page 33]. • System copy procedure for a **homogeneous** system copy only For more information, see SAP MaxDB-specific procedure [page 70].
IBM Db2 for Linux, UNIX, and Windows	Use one of the following: • System copy procedure using Jload For more information, see System Copy Procedure [page 33]. • Backup of IBM Db2 for Linux, UNIX, and Windows For more information, see IBM Db2 for Linux, UNIX, and Windows Specific Procedures [page 74].
IBM Db2 for z/OS	Use one of the following: • System copy procedure on Windows using Jload For more information, see System Copy Procedure [page 33]. • **Additional Information:** ○ For more information about the IBM Db2 for z/OS specific procedure for a **homogeneous** system copy only, see the `.PDF` attachment to **SAP Note** 680746. ○ When R3ta is used to split tables, DELETE with WHERE is not performed if import errors occur in the target system. For more information, see **SAP Note** 778729.
Oracle	Use one of the following: • System copy procedure on Windows using Jload For more information, see System Copy Procedure [page 33]. • Jload method with Export/Import Monitors For more information, see Jload Procedures Using the Java Migration Monitor [page 121]. • **Homogeneous system copy only:** Oracle backup/restore method For more information, see Oracle-Specific Procedure [page 55] and **SAP Note** 676468.
MS SQL Server	Use one of the following: • System copy procedure on Windows using Jload For more information, see System Copy Procedure [page 33]. • Jload method with Export/Import Monitors For more information, see Jload Procedures Using the Java Migration Monitor [page 121]. • **Homogeneous system copy only:** Backup/Restore or Detach/Attach Method For more information, see MS SQL Server-Specific Procedure [page 73] and **SAP Notes** 193816 and 151603.

Database	Available Methods
SAP ASE	Use one of the following: • System copy procedure on Windows using Jload For more information, see System Copy Procedure [page 33]. • Jload method with Export/Import Monitors For more information, see Jload Procedures Using the Java Migration Monitor [page 121]. • Homogeneous system copy only: Backup/Restore or Detach/Attach method For more information, see SAP ASE Server-Specific Procedure [page 85]. **Note** Before you start the system copy procedure, implement **SAP Note** 1612437.

- **Development Infrastructure (DI) only:**
  For the migration of SAP NetWeaver Development Infrastructure (NWDI) components you can apply either “Copy” or “Move”.
  - **Copy**
    “Copy” is supported only by Design Time Repository (DTR). After a copy, both the source DTR and target DTR can be used productively in parallel. However, Component Build Service (CBS) and Change Management Service (CMS) do not support such a copy.
  - **Move**
    “Move” is supported by all NWDI components – DTR, CBS, and CMS. After a move, the source system can no longer be used – that is, only the target is active after the move has been performed.

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

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

You have to make sure that all aspects are configured for optimal performance. For recommendations on NFS configuration, see **SAP Note** 2093132.

> **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.

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

> **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.

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.

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

SAP License

Once the installation is completed and the SAP system copy has been imported, you will require a new license key for the target system. The license key of the source system is **not** valid for this system. For more information about ordering and installing the SAP license, see the *SAP Library* for your release at:

SAP NetWeaver Release	Location
SAP NetWeaver 7.0	http://help.sap.com/nw70 ▶ *Application Help* ▶ *Function-Oriented View* `<Language>` ▶ *Solution Life Cycle Management by Key Capability* ▶ *SAP Licenses*.

SAP NetWeaver Release	Location
SAP NetWeaver 7.0 including EHP1	http://help.sap.com/nw701 *Application Help* > *Function-Oriented View* <Language> > *Solution Life Cycle Management by Key Capability* > *SAP Licenses*.
SAP NetWeaver 7.0 including EHP2	http://help.sap.com/nw702 *Application Help* > *Function-Oriented View* <Language> > *Solution Life Cycle Management by Key Capability* > *SAP Licenses*.
SAP NetWeaver 7.0 including EHP3	http://help.sap.com/nw703 *Application Help* > *Function-Oriented View* <Language> > *Solution Life Cycle Management by Key Capability* > *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 *SAP Library* for your release at:

SAP NetWeaver Release	Location
SAP NetWeaver 7.0	http://help.sap.com/nw70 *Application Help* > *Function-Oriented View* <Language> > *Solution Life Cycle Management by Key Capability* > *Data Archiving*.
SAP NetWeaver 7.0 including EHP1	http://help.sap.com/nw701 *Application Help* > *Function-Oriented View* <Language> > *Solution Life Cycle Management by Key Capability* > *Data Archiving*.
SAP NetWeaver 7.0 including EHP2	http://help.sap.com/nw702 *Application Help* > *Function-Oriented View* <Language> > *Solution Life Cycle Management by Key Capability* > *Data Archiving*.

SAP NetWeaver Release	Location
SAP NetWeaver 7.0 including EHP3	http://help.sap.com/nw703 ▶ *Application Help* ▶ *Function-Oriented View* `<Language>` ▶ *Solution Life Cycle Management by Key Capability* ▶ *Data Archiving* ▶.

Access to archive files is platform-independent.

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

For special prerequisites and required procedures for SAP NetWeaver 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*. To access this guide, use the SAP NetWeaver Guide Finder: In the I want to column select Operate my system, in the My Database column, select IBM Db2 for Linux, UNIX, and Windows.

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.

Related Information

Database Tuning [page 24]
Package Splitting [page 26]
Table Splitting [page 26]
Migration Monitor [page 27]
Database-Specific Central Notes [page 27]

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 – 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

Database Tuning Measures – Oracle

- Refer to **SAP Note** 936441 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 at:

SAP NetWeaver Release	Location
SAP NetWeaver 7.0	http://help.sap.com/nw70 *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*
SAP NetWeaver 7.0 including enhancement package 1	http://help.sap.com/nw701 *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*

SAP NetWeaver Release	Location
SAP NetWeaver 7.0 including enhancement package 2	http://help.sap.com/nw702 ▶ *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*
SAP NetWeaver 7.0 including enhancement package 3	http://help.sap.com/nw703 ▶ *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.

Database Tuning Measures – SAP ASE

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 Package Splitting

You can split the default packages `EXPORT.XML` and `IMPORT.XML` into several smaller and equal sized packages using the `Java Splitter` tool.

Related Information

Package and Table Splitting for Java Tables [page 129]

2.6.3 Table Splitting

For copying large Java tables, you can use the `Java Splitter` tool.

For more information, see Package and Table Splitting for Java Tables [page 129] .

Related Information

Package and Table Splitting for Java Tables [page 129]

2.6.4 Migration Monitor

The Java Migration Monitor is a tool that helps you to perform and control the unload and load process for the Java stack during the system copy procedure.

More Information

For more information, see Jload Procedures Using the Java Migration Monitor [page 121]

2.6.5 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**-specific migration optimization options, see **SAP Note** 1680803 (*Migration to SAP Sybase ASE - Best Practice*).

Related Information

System Copy and Migration Optimization [page 24]

3 Preparations

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, before you start a system copy. This is not necessary when performing a test run.

Context

The following describes the required preparations.

For more information about SAP system administration, see the *SAP Library* for your release at:

SAP NetWeaver Release	Location
SAP NetWeaver 7.0	http://help.sap.com/nw70 *System Administration and Maintenance Information* *Technical Operations for SAP NetWeaver* `<Language>`
SAP NetWeaver 7.0 including enhancement package 1	http://help.sap.com/nw701 *System Administration and Maintenance Information* *Technical Operations for SAP NetWeaver* `<Language>`
SAP NetWeaver 7.0 including enhancement package 2	http://help.sap.com/nw702 *System Administration and Maintenance Information* *Technical Operations for SAP NetWeaver* `<Language>`
SAP NetWeaver 7.0 including enhancement package 3	http://help.sap.com/nw703 *System Administration and Maintenance Information* *Technical Operations for SAP NetWeaver* `<Language>`

Procedure

1. 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 with 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 central instance.
2. If your source system is configured against a System Landscape Directory (SLD), check the size of table `BC_SLD_CHANGELOG`. The size of this table might be growing very fast because of the reasons described in SAP Note 1792134. It is recommended that you clean up table `BC_SLD_CHANGELOG` as described in SAP Note 1799613.
3. **SAP NetWeaver Development Infrastructure (DI) only**: If your SAP system is of usage type Development Infrastructure (DI) then this system can only be moved, but not be copied. This means that it is possible to migrate such a system from one host to another but it is not possible to keep both systems active after the migration. If you want to move an SAP system with usage type Development Infrastructure (DI), make sure that the following prerequisites are met:
   - The users and passwords created in the source system are valid in the target system (for example, they use the same UME).
   - Check in (or revert) all open activities (of all users) in the SAP NetWeaver Developer Studio by using the Design Time Repository perspective (DTR perspective).
   - Remove all existing development configurations from the SAP NetWeaver Developer Studio.
   - Verify in the DTR Web UI that there are no pending entries in the `NameReservation` queue. To check this, go to **`http://<dtrhost>:<port>/dtr/sysconfig/support/NameReservationList`** and check that there are no entries with the state `PRELIMINARY`, `FINALIZE_PENDING` or `REVERT_PENDING` in the queue.
     If there are entries with the state `FINALIZE_PENDING` or `REVERT_PENDING` you have to wait for the next run of the name reservation background task in the DTR server that ends these entries. This background task runs normally every 15 minutes.
     To check the frequency of this background task you can have a look at **`http://<dtrhost>:<port>/dtr/sysconfig/scheduled_tasks.html`** and check the value *Periodicity* for the task `ProcessNameReservationsTask`. Since precondition for a successful execution of this background task, the name server must be configured in the DTR server (**`http://<dtrhost>:<port>/dtr/system-tools/administration/NameServerConfiguration`**. There should be no entries with the state `PRELIMINARY` in the name reservation queue since they only occur if there are open activities (which should not be the case if you followed the previous steps).
   - Stop all applications of the Development Infrastructure (DI) on the source system.
4. **Oracle Database only:** If your source system has Oracle Database Vault, make sure that you have read section Implementing Oracle Database Vault with the Installer [page 135].
5. **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 theOracle 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.

6. **SAP NetWeaver 7.0 EHP2 and higher only**: If you want to use the Java Migration Monitor, make sure that the `JAVA_MIGMON_ENABLED` environment variable is set to "true" on both the source and the target systems.
7. **BI customers:** If you want to perform a system landscape copy for SAP NetWeaver BW, apply SAP Note 886102.
8. If you use the Integration Repository and Directory, make sure that you apply SAP Note 1345600 to avoid any database inconsistencies.
9. **IBM Db2 for Linux, UNIX, and Windows** only: `JSizeCheck` requires monitoring functions that are no longer available as of IBM Db2 for Linux, UNIX, and Windows version 10.5 by default. Before you start a Java export, you have to create these monitoring functions as follows:
   a. Log on as user `db2<dbsid>`.
   b. Execute the following command: **`db2updv<DB2 version> -r -d <DBSID> -u db2<dbsid> -p <password>`**

   > **Note**
   >
   > The name of the `db2updv...` tool changes with each DB2 version. For example, for DB2 10.5 or 11.1, you need to use `db2updv105` or `db2updv111`, respectively.

10. Make sure that you update the CIM data model in the system landscape directory (SLD) of the source system as described in SAP Note 669669. Otherwise you might get an error during the target system installation (see SAP Note 1840394).

3.2 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 installer as such.

For the media required for performing the **target system installation**, refer to section *Preparing the installation Media* in the installation guide for your operating system platform and database at https://help.sap.com/sltoolset *Area System Provisioning* *Guide for Installation of Systems Based on SAP NetWeaver 7.0 / 7.0 EHPs* (see also Installing the Target System [page 50]).

> **Note**
>
> The signature of media is checked **automatically** by the installer during the *Define Parameters* phase while processing the *Media Browser* screens. As of now the installer only accepts media whose signature has been checked. See also the description of this new security feature in SAP Note 2393060.

Related Information

Downloading and Extracting the Software Provisioning Manager 1.0 Archive [page 31]

3.2.1 Downloading and Extracting the Software Provisioning Manager 1.0 Archive

You must request a medium with the `70SWPMJDS<Support_Package_Number>_<Version_Number>.SAR` archive, and then extract this archive. You cannot download this archive directly from the SAP Software Download Center..

Context

You require 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. For more information about how to get this tool, see the *Procedure* section below.

Procedure

1. Request the medium with the Software Provisioning Manager 1.0 archive `70SWPMJDS<Support_Package_Number>_<Version_Number>.SAR` from SAP as follows:
   a. Ask SAP support to create an incident on component `XX-SER-SWFL-SHIP` to enable you to use medium with `70SWPMJDS<Support_Package_Number>_<Version_Number>.SAR`.
   b. Put the incident on component `BC-INS-RMP` to get support information about how to use `70SWPMJDS<Support_Package_Number>_<Version_Number>.SAR`.

   For more information, see SAP Note 2595196 .
2. Make sure that you use the **latest** version of the `SAPCAR` tool when manually extracting the Software Provisioning Manager archive.

   > **Note**
   >
   > An older `SAPCAR` version might extract archive files in a wrong way and this could prevent the installer from working consistently.

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

   a. Go to https://launchpad.support.sap.com/#/softwarecenter *SUPPORT PACKAGES & PATCHES* and search for "**sapcar**".
   b. Select the archive file for your operating system and download it to an empty directory.

c. To check the validity of the downloaded executable, right-click the executable and choose *Properties*. On the *Digital Signatures* tab you can find information about the SAP signature with which the executable was signed.
d. Rename the executable to **sapcar.exe**.

For more information about SAPCAR, see SAP Note 212876.

3. Using the latest version of SAPCAR, you can verify the signature of the downloaded 70SWPMJDS<Support_Package_Number>_<Version_Number>.SAR archive as follows:
   a. Get the latest version of the SAPCRYPTOLIB archive to your installation host as follows:
      1. Go to https://launchpad.support.sap.com/#/softwarecenter *SUPPORT PACKAGES & PATCHES* and search for "**sapcryptolib**".
      2. Select the archive file for your operating system and download it to the same directory where you have put the SAPCAR executable.
      3. Use the following command to extract the SAPCRYPTOLIB archive to the same directory where you have put the SAPCAR executable:
         sapcar –xvf sapcryptolibp_84…sar –R <target directory>
      4. Download the Certificate Revocation List from https://tcs.mysap.com/crl/crlbag.p7s and move it to the same directory.
   b. Verify the signature of the downloaded 70SWPMJDS<Support_Package_Number>_<Version_Number>.SAR archive by executing the following command:

      > **Note**
      >
      > Check SAP Notes 2178665 and 1680045 whether additional information is available.

      <Path to SAPCAR>\sapcar.exe -tvVf<Path to Download Directory>\70SWPMJDS<Support_Package_Number>_<Version_Number>.SAR -crl<file name of revocation list>

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

   <Path to SAPCAR>\sapcar.exe -xvf <Path to Download Directory>\70SWPMJDS<Support_Package_Number>_<Version_Number>.SAR <Path to Unpack Directory>

   > **Note**
   >
   > Make sure that all users have read permissions for the directory where you want to unpack the installer.

   > **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.

4 Database Independent System Copy

You can use the installer to export and import your Java database content, file system, and all configuration in a database-independent format. It uses the **Jload** tool.

Jload

> Note

Constraints

Jload Restrictions

- The installer generates a database dump of all SAP objects that are defined in the Java Dictionary (Jload). Other objects are not exported by the installer.
- 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.

Process Flow

Proceed as described in System Copy Procedure [page 33].

4.1 System Copy Procedure

This section describes the system copy procedure using Jload .

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.

Process Flow on the Source System (Export)

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

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

- Central system
  - Central system – Performing the Export on the Source System
  - Central 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

Central System – Performing the Export on the Source System

To perform the export for a central system, you need to proceed as follows on the central system host:

1. Perform the export on the **central system host**:
   1. You run the installer [page 38] to export the database instance and the central instance.
      On the *Welcome* screen, choose the option *Database and Central Instance Export*.
      For more information, see Running the Installer to Perform the Export [page 38].

Central System – Setting Up the Target System

Use the installer 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 49], but refers for all steps that are identical with a new system installation to the appropriate operating system and database-specific installation guide available at http://support.sap.com/sltoolset *System Provisioning* *Installation Option of Software Provisioning Manager*.
>
> In the following, we refer to this guide as “installation guide”.

Perform the following steps on the **central system host**:

1. Prepare the central system host for the installation of your target system as described in the installation guide.
2. Transfer the export files [page 49] to the central system target host.
3. Install the target system [page 50].
4. If required install additional **dialog instances** on **dialog instance hosts** 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**, you need to proceed as follows:

1. When exporting a distributed system using local export directories, the created export directories need to be merged, that is copied together. Make sure that the `SOURCE.PROPERTIES` file is the one created when exporting the central instance.
2. Perform the export on the **database instance host**:
   1. You run the installer [page 38] to export the database instance. On the *Welcome* screen, choose the option *Database Instance Export*.
      For more information, see Running the Installer to Perform the Export [page 38].
3. Perform the export on the **central instance host**:
   You run the installer to export the central instance. For more information, see Running the Installer to Perform the Export [page 38].
   On the *Welcome* screen, choose the option *Central Instance Export*.

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

Use the installer 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 49], but refers for all steps that are identical with a new system installation to the appropriate operating system and database-specific installation guide available at http://support.sap.com/sltoolset *System Provisioning* *Installation Option of Software Provisioning Manager*.
>
> 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. Prepare the **SCS instance host**, the **central instance host** and the **database instance host** for the installation of the corresponding instances of your target system as described in the installation guide.
2. Install the **SCS instance** for the target system as described in the installation guide.
3. Perform the following steps on the **database instance host**:
   1. Transfer the export files to the database instance target host. For more information, see Transferring the Export Files to the Target Host [page 49].
   2. Install the database instance of the target system. For more information, see Installing the Target System [page 50].
4. On the **central instance host**, install the **central instance** of the target system.
5. If required, install additional **dialog instances** on the **dialog instance hosts** as described in the installation guide.

4.1.1 Exporting the Source System

Here you can find information about how to run the installer 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 33].

Related Information

Prerequisites for Running the Installer [page 36]
Running the Installer [page 38]

4.1.1.1 Prerequisites for Running the Installer

Make sure you fulfil the following prerequisites before running the installer.

- For the SL Common GUI, 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 Common GUI:
    - 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 Common GUI 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 Common GUI.

  For more information about the SL Common GUI, see Useful Information About the Installer [page 42].
- Make sure that you use an account that is a member of the local `Administrators` group.
- 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 installer and the SL Common GUI.
    If this port cannot be used, you can assign a free port number by executing `sapinst.exe` 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 installer 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.exe` with the following command line parameter:
    `SAPINST_HTTP_PORT=<Free Port Number>`
- If you want to perform the export in unattended mode, see SAP Note 2230669 which describes an improved procedure using `inifile.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.
- 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.
- Before starting the export steps on the central instance of the source system, make sure that you have at least the same amount of disk space available in `\\SAPLOC\<SAPSID>\<Instance_Name>\SDM \program` as is used in `\\SAPLOC\<SAPSID>\<Instance_Name>\root\origin`. During the export some archives are written to the program subdirectories and the installer aborts if there is not enough space.

4.1.1.1.1 Required User Authorization for Running the Installer

Use

Although the installer automatically grants the required rights to the user account used for the installation, you have to check whether this account has the required authorization to perform the installation. The authorization required depends on whether you intend to perform a **domain** or **local** installation. If necessary, you have to ask the system administrator to grant the account the necessary authorization **before** you start the installation. If you attempt the installation with an account that has not the required authorization, the installation aborts.

This section informs you about the authorization required for a domain and a local installation.

Procedure

> ⚠ Caution
>
> Do **not** use the user `<sapsid>adm` for the installation of the SAP system.

Domain Installation

For a domain installation the account used for the installation needs to be a member of the local `Administrators` and the domain `Admins` group of the domain involved. All machines in the system must belong to the same domain. In a domain installation, the user information is stored centrally on the domain controller and can be accessed by all hosts in the system.

If the SAP system is to be distributed across **more than one** machine, SAP strongly recommends you to perform a domain installation to avoid authorization problems.

> ⚠ Caution
>
> - If you install a system distributed over several hosts as a local installation, this can lead to authorization problems for the operating system users `<sapsid>adm` and `SAPService<SAPSID>`. It can also lead to

problems with the transport directory, which is usually shared by several SAP systems. SAP does **not** support distributed SAP systems running with a local user account..

- For performance and security reasons, SAP does not support an SAP system installation on a domain controller.
- If for any reason, the account used for the installation is not a member of the domain `Admins` group, you can perform the installation with a domain user who is a member of the local `Administrators` group. However, the domain administrator has to prepare the system appropriately for you.

For a domain installation, you need to:

1. Check that the account used for the installation is a member of the domain `Admins` group.
2. If required, obtain these rights by asking the system administrator to enter the account as a member of the domain `Admins` group.

Local Installation

For a local installation the account used for the installation needs to be a member of the local `Administrators` group of the machine involved. In a local installation, all Windows account information is stored locally on one host and is not visible to any other hosts in the system.

If the SAP system is to run on a **single** machine, you can perform a local installation.

> ⚠ Caution
>
> Do not use the Windows built-in account `Administrator` or the renamed built-in account to install your SAP system with the installer. The built-in account only has restricted network access rights that are required by the installer. If you renamed the built-in account `Administrator`, do not create a new account named `Administrator`.

For a local installation, you need to:

1. Check that the account used for the installation is a member of the local `Administrators` group.
2. If required, obtain these rights by asking the system administrator to enter the account as a member of the local `Administrators` group.

4.1.1.2 Running the Installer

This section describes how to run the installer to perform the export for system copy.

Prerequisites

For more information, see Prerequisites for Running the Installer [page 36].

Context

Software Provisioning Manager (the “installer” for short) has a web browser-based GUI named “SL Common GUI of the Software Provisioning Manager” - “SL Common GUI” for short.

This procedure describes an installation where you run the installer and use the SL Common GUI, that is you can control the processing of the installer from a browser running on any device.

For more information about the SL Common GUI, see Useful Information About the Installer [page 42].

Procedure

1. Log on to the host where you want to run the installer.

   Make sure that you log on as a user with the required authorization for running the installer.

   This user must be at least a member of the local `Administrators` group.

   > **Caution**
   >
   > Do not use an existing `<sapsid>adm` user.

   If your security policy requires that the person running the installer is not allowed to know administrator credentials on the host where the installer 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 `sapinst.exe` from the command line. You have to 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 30].

3. Start the installer as follows:

   Double-click `sapinst.exe` from the directory to which you unpacked the Software Provisioning Manager archive file.

   > **Note**
   >
   > By default, the SL Common GUI uses the default browser defined for the host where you run the installer. However, you can also specify another supported web browser available on the host where you start the installer. You can do this by starting the `sapinst` executable with command line option **`SAPINST_BROWSER=<Path to Browser Executable>`**, for example **`SAPINST_BROWSER=firefox.exe`**.

   The installer GUI starts automatically by displaying the *Welcome* screen.

4. The installer is starting up.

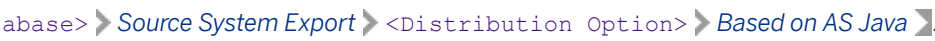
   The installer now starts and waits for the connection with the SL Common GUI. If you have a supported web browser (see Prerequisites for Running the Installer [page 36]) installed on the host where you run the installer, the SL Common GUI starts automatically by displaying the *Welcome* screen.

If the SL Common GUI does not open automatically, you can find the URL you require to access the SL Common GUI at the bottom of the *Program Starter* window of the installer. You find the icon of the *Program Starter* window in the taskbar of your Windows host. Open a supported web browser and run the URL from there.

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

The SL Common GUI opens in the browser by displaying the *Welcome* screen.

> **Note**
>
> Before you reach the *Welcome* screen, your browser might warn you that the certificate of the `sapinst` process on this computer could not be verified. Accept this warning to inform your browser that it can trust this site, even if the certificate could not be verified.

5. On the *Welcome* screen, choose  `<Product>` *Software Life-cycle Options* *System Copy* `<Database>` *Source System Export* `<Distribution Option>` *Based on AS Java*.

   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 33].

   > **Note**
   >
   > Do **not** perform these steps if you use a **database-specific method** (see Database-Specific System Copy [page 53]).

6. Choose *Next*.

   > **Note**
   >
   > If there are errors during the self-extraction process of the installer, you can find the log file `dev_selfex.out` in the temporary directory.

7. If the installer prompts you to log off from your system, log off and log on again.

   The installer restarts automatically.

8. Follow the instructions in the installer input screens and enter the required parameters.

   > **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.

   > **Note**
   >
   > **Oracle Database only:** If your source system has Oracle Database Vault, consider the additional information in section Implementing Oracle Database Vault with the Installer [page 135].

> ⚠ Caution
>
> The signature of media is checked **automatically** during the *Define Parameters* phase while processing the *Media Browser* screens.
>
> Keep in mind that this automatic check is only committed once and **not** repeated if you modify artefacts 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 signature is not checked again.
>
> See also the description of this new security feature in SAP Note 2393060.

9. After you have entered all requested input parameters, the installer displays the *Parameter Summary* screen. This screen shows both the parameters that you entered and those that the installer set by default.

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

10. To start the execution, choose *Next*.

    The installer starts the export and displays its progress of the system copy export during the processing phase.

11. If you copied installation media to your hard disk, you can delete these files when the installer 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 installer:

    ```
    %userprofile%\.sapinst\
    ```

Related Information

Useful Information About the Installer [page 42]
Interrupted Processing of the Installer [page 43]
Troubleshooting with the Installer [page 46]

4.1.1.3 Additional Information About the Installer

The following sections provide additional information about the installer.

Useful Information About the Installer [page 42]
: This section contains some useful technical background information about the installer and the installer GUI.

Interrupted Processing of the Installer [page 43]
: Here you find information about how to restart the installer if its processing has been interrupted.

Troubleshooting with the Installer [page 46]
: This section tells you how to proceed when errors occur while the installer is running.

Troubleshooting during the Export Process [page 47]

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 48]
This section describes how to use the `Step State Editor` available in the installer.

4.1.1.3.1 Useful Information About the Installer

This section contains some useful technical background information about the installer and the installer GUI.

- Software Provisioning Manager (the “installer” for short) has the web browser-based “SL Common GUI of the Software Provisioning Manager” - “SL Common GUI” for short.
  The SL Common GUI 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.

  The SL Common GUI 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 Common GUI, the installer provides a pre-generated URL in the *Program Starter* window. If you have a supported web browser installed on the host where you run the installer, the SL Common GUI starts automatically.
  By default, the SL Common GUI uses the default browser defined for the host where you run the installer. However, you can also specify another supported web browser available on the host where you start the installer. You can do this by starting the `sapinst` executable with command line option **`SAPINST_BROWSER=<Path to Browser Executable>`**, for example **`SAPINST_BROWSER=firefox.exe`**.
  Alternatively you can open a supported web browser on any device and run the URL from there.
  For more information about supported web browsers see Prerequisites for Running the Installer [page 36].
  If you need to run the **SL Common GUI** in **accessibility mode**, apply the standard accessibility functions of your web browser.
- As soon as you have started the `sapinst.exe` executable, the installer creates a `.sapinst` directory underneath the `<Drive>:\Users\<User>` directory where it keeps its log files. `<User>` is the user which you used to start the installer.
  After you have reached the *Welcome* screen and selected the relevant installer option for the SAP system to be exported , the installer creates a directory `sapinst_instdir`, where it keeps its log files, and which is located directly in the `%ProgramFiles%` directory. If the installer is not able to create `sapinst_instdir` there, it tries to create `sapinst_instdir` in the directory defined by the `TEMP` environment variable.
  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.

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

- The installer extracts itself to a temporary directory called `sapinst_exe.xxxxxx.xxxx`, which is located in `%TEMP%`, `%TMP%`, `%TMPDIR%`, or `%SystemRoot%`. These files are deleted after the installer has stopped running.
  The temporary directory `sapinst_exe.xxxxxx.xxxx` sometimes remains undeleted. You can safely delete it.
  The temporary directory also contains the log file `dev_selfex.out` from the self-extraction process of the installer, which might be useful if an error occurs.

  > ⚠ Caution
  >
  > If the installer cannot find a temporary directory, the installation terminates with the error `FCO-00058`.

- To see a list of all available installer properties, open a command prompt and start the installer with command line parameter **`-p`**:
  `sapinst.exe -p`
- If you want to perform the export in unattended mode, see SAP Note 2230669 which describes an improved procedure using `inifile.params`.
- Before starting the export steps on the central instance of the source system, make sure that you have at least the same amount of disk space available in `\\SAPLOC\<SAPSID>\<InstanceName>\<SAPSID>\program` as is used in `\\SAPLOC\<SAPSID>\<InstanceName>\<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 installer by choosing the *Cancel* button.

  > ℹ Note
  >
  > If you need to terminate the installer, choose *File* > *Exit* in the menu of the *Program Starter* window.

4.1.1.3.2 Interrupted Processing of the Installer

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

Context

The processing of the installer might be interrupted for one of the following reasons:

- An error occurred during the *Define Parameters* or *Execute* phase:
  The installer 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 installer by choosing *Cancel* in the SL Common GUI.

> ⚠ 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	The installer retries the installation from the point of failure without repeating any of the previous steps. This is possible because the installer records the installation progress in the `keydb.xml` file. We recommend that you view the entries in the log files, try to solve the problem, and then choose *Retry*. If the same or a different error occurs, the installer displays the same dialog box again.
Stop	The installer stops the installation, closing the dialog box, the installer GUI, and the GUI server. The installer records the installation progress in the `keydb.xml` file. Therefore, you can continue the installation from the point of failure without repeating any of the previous steps. See the procedure below.
Continue	The installer continues the installation from the current point.
View Log	Access installation log files.

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

Procedure

1. Log on to the installation host as a user with the required permissions as described in Running the Installer [page 38] .
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 30].

> ➔ 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.

3. Restart the installer by double-clicking **sapinst.exe** from the directory to which you unpacked the Software Provisioning Manager archive.

   By default, the SL Common GUI uses the default browser defined for the host where you run the installer. However, you can also specify another supported web browser available on the host where you start the installer. You can do this by starting the `sapinst` executable with command line option **SAPINST_BROWSER=<Path to Browser Executable>**, for example **SAPINST_BROWSER=firefox.exe**.

4. The installer is restarting.

   The installer now starts and waits for the connection with the SL Common GUI. If you have a supported web browser (see Prerequisites for Running the Installer [page 36]) installed on the host where you run the installer, the SL Common GUI starts automatically by displaying the *Welcome* screen.

   If the SL Common GUI does not open automatically, you can find the URL you require to access the SL Common GUI at the bottom of the *Program Starter* window of the installer. You find the icon of the *Program Starter* window in the taskbar of your Windows host. Open a supported web browser and run the URL from there.

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

   The SL Common GUI opens in the browser by displaying the *Welcome* screen.

   > **Note**
   >
   > Before you reach the *Welcome* screen, your browser might warn you that the certificate of the `sapinst` process on this computer could not be verified. Accept this warning to inform your browser that it can trust this site, even if the certificate could not be verified.

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

Perform a new run	The installer does not continue the interrupted export for system copy option. Instead, it moves the content of the old installer directory and all installer-specific files to a backup directory. Afterwards, you can no longer continue the old option.
	The following naming convention is used for the backup directory:
	`log_<Day>_<Month>_<Year>_<Hours>_<Minutes>_<Seconds>`
	Example
	`log_01_Oct_2016_13_47_56`
	Note
	All actions taken by the export for system copy before you stopped it (such as creating directories or users) are not revoked.
	Caution
	The installer 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.

Continue with the existing one	The installer continues the interrupted export for system copy from the point of failure.

4.1.1.3.3 Troubleshooting with the Installer

This section tells you how to proceed when errors occur while the installer is running.

Context

If an error occurs, the installer:

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

Procedure

1. Check SAP Note 1548438 for known installer 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 installer log files (`sapinst.log` and `sapinst_dev.log`) for errors, choose the *LOG FILES* tab.

       > **Note**
       >
       > The *LOG FILES* tab is only available if you have selected on the *Welcome* screen the relevant installer 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 the files in the `.sapinst` directory underneath the `<Drive>:\Users\<User>` directory, where `<User>` is the user which you used to start the installer.
       >
       > Fore more information, see Useful Information About the Installer [page 42].

     - To check the log and trace files of the installer GUI for errors, go to the directory `%userprofile%\.sapinst\`
     - Then continue by choosing *Retry*.
   - If required, abort the installer by choosing *Cancel* in the tool menu and restart the installer. For more information, see Interrupted Processing of the Installer [page 43].
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.

4.1.1.3.4 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.

4.1.1.3.5 Using the Step State Editor (SAP Support Experts Only)

This section describes how to use the `Step State Editor` available in the installer.

> **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 installer meets the requirements listed in Prerequisites for Running the Installer [page 36].

Procedure

1. Start the installer from the command line as described in Running the Installer [page 38] with the additional command line parameter **`SAPINST_SET_STEPSTATE=true`**
2. Follow the instructions on the installer 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 installer during the *Execute Service* phase. By default all steps are in an initial state. Underneath each step, you see the assigned installer 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 installer to pause.
   - Mark the checkbox in front of the *Skip* option of the steps which you want the installer 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 installer 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 installer.
5. Continue until you have run through all the steps of the *Execute Service* phase of the installer.

4.1.2 Setting Up the Target System

Related Information

Transferring the Export Files to the Target Host [page 49]
Installing the Target System [page 50]

4.1.2.1 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 other export files).
   >
   > Otherwise, the installer does not ask you to specify the export directory and automatically chooses one that you may not want to use. In this case, the installer 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. All files have to be accessible for user `<sapsid>adm` of the target system.

> **Note**
>
> If your source system is a distributed system, the files created by the export of the central instance and the files created by the export of the database instance have to be located in the same `<EXPDIR>` directory for the installation of the target system.
>
> If you have not exported into the same `<EXPDIR>` already, then you have to merge the two `<EXPDIR>` directories from the central instance export and from the database instance export before starting the target system installation.
>
> Make sure you use the `SOURCE.PROPERTIES` file from the central instance export when merging the two export folders.

4.1.2.2 Installing the Target System

This section describes how to set up the target system using the installer.

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:

Windows: `<DRIVE>:\<EXPDIR>\DB\<DATABASE>`

UNIX, IBM i: `<EXPDIR>/DB/<DATABASE>`

SAP MaxDB only: If the database platform of your target system is SAP MaxDB, you must reserve at least two times the amount of space 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.

> **Note**
>
> The compression information is not available in the life-cycle of a Java system. Therefore, there is no information about the source system contained in the `DBSIZE.XML` file.
>
> You can set the compression in the target system by creating compressed tablespaces during the *Define Parameters* phase of the target system installation. However, compression is not set automatically in the `DBSIZE.XML` during a system copy.

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. You can find this installation guide at:

   http://support.sap.com/sltoolset *Area System Provisioning* *Guide for Installation of Systems Based on SAP NetWeaver 7.0 / 7.0 EHPs*

   > **Note**
   >
   > **IBM DB2 for Linux, UNIX and Windows only**:
   >
   > Make sure that you read the information provided in section *Setup of Database Layout* in the installation documentation.

2. Start the installer 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 installer to avoid performance problems during the dialog phase. You can find the latest version of the installer on the SAP Service Marketplace.

3. On the *Welcome* screen, navigate to the following folder according to the requirements of your target system: `<Product>` *Software Life-Cycle Options* *System Copy* `<Database>` *Target System Installation* `<System_Variant>` *Based on* `<Technical_Stack>`.
4. Run the installation options required for your system copy in the sequence they are listed in the specific folder and according to process flow in Setting Up the Target System Using the Installer [page 49].
5. To install the target system, follow the instructions in the installer input screens (*Define Parameters* phase) and enter the required parameters.

   > **Caution**
   >
   > **Heterogeneous system copy:** When installing the database instance, you either have to choose parameter mode *Custom* or have to check the *SAP System > Database Import* dialog on the summary screen and then revise this dialog. Only then appears the dialog screen where you can enter the migration key, which is required for a heterogeneous system copy. If you forget to revise this dialog setting during the dialog phase, the installer will abort in the processing phase when checking the migration key and will ask you for a valid migration key.

   > **Note**
   >
   > **Oracle Database only:** If your source system has Oracle Database Vault, consider the additional information in section Implementing Oracle Database Vault with the Installer [page 135].

   - On the *SAP System > Database* screen, choose the option *Standard System Copy/Migration (load-based)*:
     The SAP data dump from the migration export media that was created during the export is loaded into the newly installed SAP system database.

- When the installer prompts for the migration export, enter the path to the export directory `<EXPDIR>`.

> **Caution**
>
> **IBM DB2 for Linux, UNIX and Windows only**:
>
> - Make sure that you take the information about *automatic storage* that is provided in the *Running the Installer* section in the appropriate installation guide into consideration.
> - The option *Deferred Table Creation* is **not supported** for load-based system copies for SAP systems that are **not** based on SAP NetWeaver 7.0 or higher.
> - Do **not** create the installation directory (for example, `sapinst_instdir`) under the following directories:
>   - **UNIX, IBM i**: `/usr/sap/<SAPSID>`
>   **Windows**: `\usr\sap\<SAPSID>`
>   - **UNIX, IBM i**: `/sapmnt/<SAPSID>`
>   **Windows**: `\sapmnt\<SAPSID>`

6. Complete the installation as described in the installation documentation for your SAP component.

> **Note**
>
> If you have to restart the import after an error, just restart the installer. The import continues with the table that has not yet been successfully imported.

5 Database-Specific System Copy

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

Process

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

- Central System
- Distributed System
- High Availability System

Central System

Process Flow on the Source System (Export)

> **Note**
>
> When performing the export, the installer creates a migration export media which contains the data of the exported system, and which you use to install the target system.

1. **Oracle only**: Generate the control file structure for the target database [page 59].
2. **Oracle only**: If required, create an offline backup of the source database [page 68].
3. Run the installer [page 38] to create the export directory structure with labels and to archive SDM and application-specific file system content.
   In the installer, choose the option that corresponds to your database, SAP system, and technology, and then *Database and Central Instance Export*.

   > **Example**
   >
   > Choose *SAP NetWeaver including* `<Enhancement Package>` > *Software Life-Cycle Options* > *System Copy* > `<Database>` > *Source System Export* > *Central System* > *Based on AS ABAP and AS Java* > *Database and Central Instance Export*

Process Flow on the Target System

> **Note**
>
> For the target system installation, you use the installation guide for your target operating system and database, available at http://support.sap.com/sltoolset > *System Provisioning* > *Installation Option of Software Provisioning Manager* > *Installation Guides - Application Server Systems*. In the following we refer to this documentation as “installation guide”.

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

   > **Note**
   >
   > If required, restart the installer as described in the installation guide for your operating system and database, available at http://support.sap.com/sltoolset ▸ *System Provisioning* ▸ *Installation Option of Software Provisioning Manager* ▸ *Installation Guides - Application Server Systems* ▸.

3. To complete the system copy, you perform the follow-up activities [page 87].

Distributed System or High Availability System

Process Flow on the Source System (Export)

> **Note**
>
> When performing the export, the installer creates a migration export media which contains the data of the exported system, and which you use to install the target system.

1. **Oracle only**: On the **database instance host** of the source system, generate the control file structure for the target database [page 59].
2. **Oracle only**: If required, on the **database instance host**, create an offline backup of the source database [page 68].
3. On the **central instance host**, run the installer [page 38] to create the export directory structure with labels and to archive SDM and application-specific file system content.
   In the installer, choose the option that corresponds to your database, SAP system, and technology, and then *Central Instance Export*.

   > **Example**
   >
   > Choose ▸ *SAP NetWeaver including* `<Enhancement Package>` ▸ *Software Life-Cycle Options* ▸ *System Copy* ▸ `<Database>` ▸ *Source System Export* ▸ *Distributed System* ▸ *Based on AS ABAP and AS Java* ▸ *Central Instance Export* ▸

Process Flow on the Target System

> **Note**
>
> For the target system installation, you use the installation guide for your target operating system and database, available at http://support.sap.com/sltoolset ▸ *System Provisioning* ▸ *Installation Option of Software Provisioning Manager* ▸ *Installation Guides - Application Server Systems* ▸. In the following we refer to this documentation as “installation guide”.

1. On the **database instance host**, install the database software as described in the installation guide.
2. On the **database instance host** start the installer as described in the installation guide, follow the instructions on the installer screens until you are requested to perform the database backup/restore.

> **Note**
>
> If required, restart installer as described in the installation guide.

3. To complete the system copy, you perform the follow-up activities [page 87].

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 installer for the installation on the target system host as described in the installation documentation for your SAP component. Only the installer 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 Jload 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.

> **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 installer 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 `sapr3` with `sqlplus` and enter: `SELECT * FROM V$NLS_PARAMETERS;`
- If your source system has Oracle Database Vault, consider the additional information in section Implementing Oracle Database Vault with the Installer [page 135].

Oracle Storage-Based System Copy Methods Available in the Installer

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 installer 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 56]
- Using a CONTROL.SQL File Created by the ORABRCOPY Tool [page 59]

Related Information

Database-Specific System Copy [page 53]

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 (the “installer” for short) 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 57]
Performing Offline Recovery [page 58]

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 sapadm <Password> -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 -user sapadm <password> -function FinalizeDatabaseCopy -dbname
   <DBSID> -dbtype ora -dbconfdir <shared_directory> -copymethod Online -timeout -1
   ```

4. You can copy the database from the source to the target system but alternatively, you can also install the Oracle database software in the target system.

   It is possible to copy the Oracle database software automatically with the tool when the database software has the same `<DBSID>` as the database `<DBSID>`.

   Example

   `<Source DBSID> = C67`

   `<Target DBSID> = T67`

   The Oracle software is under `c:\oracle\C67\112` and the Oracle database files are under `c:\oracle\C67` and `d:\oracle\C67`.

The tool moves `c:\oracle\C67` to `c:\oracle\T67` and `d:\oracle\C67` to `d:\oracle\T67` with all subdirectories.

If there are database files under the directory that contains the Oracle software and you do not want to move the Oracle software, you have to move the database directory manually.

For more information about how to install the Oracle database software, see section *Installing the Oracle Database Software* in the *Installation Guide - Installation of SAP Systems Based on the Application Server ABAP of SAP NetWeaver 7.0 to 7.03 on Windows : Oracle* at https://support.sap.com/sltoolset *System Provisioning* *Installation Option of Software Provisioning Manager* *Installation Guides - Application Server Systems*.

5. Start the target system installation and follow the instructions on the installer 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 7.0 to 7.03 on Windows : Oracle* at https://support.sap.com/sltoolset *System Provisioning* *Installation Option of Software Provisioning Manager* *Installation Guides - Application Server Systems*

6. 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 installer 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 7.0 to 7.03 on Windows : Oracle* at https://support.sap.com/sltoolset *System Provisioning* *Installation Option of Software Provisioning Manager* *Installation Guides - Application Server Systems*

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 additonal files from the source system are needed.
6. When the installer stops for database restore, copy all saved files to the target System.

   Make sure that you also copy the source `init<SID>.ora` file

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

Related Information

Generating the Control File Structure [page 59]
Preparing the Target System (Oracle) [page 63]
Restoring Database Files on the Target System [page 65]
Restoring the Database Files on the Target System with BR*Tools [page 66]

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 139].

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>` 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.bat` script in one of the following ways:
   - If you perform an **offline** manual copy, enter the following commands:
     `ora_br_copy.bat -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.bat -generateFiles -targetSid <TARGET_DBSID> -password <system_password> -listenerPort <listener_port>`

     > **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 (
'D:\ORACLE\NEW\ORIGLOGA\LOG_G11M1.DBF',
'D:\ORACLE\NEW\MIRRLOGA\LOG_G11M2.DBF'
) SIZE 50M,
GROUP 2 (
'D:\ORACLE\NEW\ORIGLOGB\LOG_G12M1.DBF',
'D:\ORACLE\NEW\MIRRLOGB\LOG_G12M2.DBF'
) SIZE 50M,
GROUP 3 (
'D:\ORACLE\NEW\ORIGLOGA\LOG_G13M1.DBF',
'D:\ORACLE\NEW\MIRRLOGA\LOG_G13M2.DBF'
) SIZE 50M,
GROUP 4 (
'D:\ORACLE\NEW\ORIGLOGB\LOG_G14M1.DBF',
'D:\ORACLE\NEW\MIRRLOGB\LOG_G14M2.DBF'
) SIZE 50M
DATAFILE
'D:\ORACLE\NEW\SAPDATA1\SYSTEM_1\SYSTEM.DATA1',
```

```
'D:\ORACLE\NEW\SAPDATA3\IMS_1\IMS.DATA1',
'D:\ORACLE\NEW\SAPDATA3\IMS_2\IMS.DATA2',
'D:\ORACLE\NEW\SAPDATA3\IMS_3\IMS.DATA3',
'D:\ORACLE\NEW\SAPDATA3\IMS_4\IMS.DATA4',
'D:\ORACLE\NEW\SAPDATA4\IMS_5\IMS.DATA5',
'D:\ORACLE\NEW\SAPDATA4\IMS_6\IMS.DATA6',
'D:\ORACLE\NEW\SAPDATA4\IMS_7\IMS.DATA7',
'D:\ORACLE\NEW\SAPDATA4\IMS_8\IMS.DATA8',
'D:\ORACLE\NEW\SAPDATA4\IMS_9\IMS.DATA9',
'D:\ORACLE\NEW\SAPDATA1\IMS700_1\IMS700.DATA1',
'D:\ORACLE\NEW\SAPDATA1\IMS700_2\IMS700.DATA2',
'D:\ORACLE\NEW\SAPDATA1\IMS700_3\IMS700.DATA3',
'D:\ORACLE\NEW\SAPDATA1\IMS700_4\IMS700.DATA4',
'D:\ORACLE\NEW\SAPDATA2\IMS700_5\IMS700.DATA5',
'D:\ORACLE\NEW\SAPDATA2\IMS700_6\IMS700.DATA6',
'D:\ORACLE\NEW\SAPDATA2\IMS700_7\IMS700.DATA7',
'D:\ORACLE\NEW\SAPDATA2\IMS700_8\IMS700.DATA8',
'D:\ORACLE\NEW\SAPDATA2\IMS700_9\IMS700.DATA9',
'D:\ORACLE\NEW\SAPDATA3\IMS700_10\IMS700.DATA10',
'D:\ORACLE\NEW\SAPDATA4\IMS700_11\IMS700.DATA11',
'D:\ORACLE\NEW\SAPDATA1\IMSUSR_1\IMSUSR.DATA1',
'D:\ORACLE\NEW\SAPDATA2\ROLL_1\ROLL.DATA1'
;
ALTER DATABASE OPEN RESETLOGS;
ALTER TABLESPACE PSAPTEMP ADD TEMPFILE
'D:\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 (`
   `'D:\ORACLE\NEW\ORIGLOGA\LOG_G11M1.DBF',`
   `'D:\ORACLE\NEW\MIRRLOGA\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. `'D:\ORACLE\NEW\SAPDATA1\SYSTEM_1\SYSTEM.DATA1',`
   `'D:\ORACLE\NEW\SAPDATA3\IMS_1\IMS.DATA1',`
   ...
   `'D:\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`
   `'D:\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 installer 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 table space names of the new target system. When installing the target central instance, database instance, or dialog instance make sure that you enter the correct database schema names (which are the database schema name of the **source** system). The schema names of the source and target system must be identical.

   a. On the *Welcome* screen, choose *<SAP Product>* ▸ *Software Life-Cycle Options* ▸ *System Copy* ▸ *<Database>* ▸ *Target System Installation* ▸ *<System Variant>*.
   b. When the installer prompts for the installation type, choose *Homogeneous System Copy (Backup/Restore)*.
   c. Proceed until the installer stops to restore the database files on the target system.

      The following message is displayed:

      ```
      SAPinst now stops the installation. Please proceed as follows:...
      ```

2. If they do not exist, create the following directories on the target system:
   - `<drive>:\oracle\<TARGET_DBSID>\mirrlog<x>`
   - `<drive>:\oracle\<TARGET_DBSID>\origlog<x>`
   - `<drive>:\oracle\<TARGET_DBSID>\sapdata<x>`
   - `<drive>:\oracle\<TARGET_DBSID>\sapreorg`
   - `<drive>:\oracle\<TARGET_DBSID>\saparch`
   - `<drive>:\oracle\<TARGET_DBSID>\oraarch`
   - `<drive>:\oracle\<TARGET_DBSID>\saptrace`
   - `<drive>:\oracle\<TARGET_DBSID>\saptrace\background`
   - `<drive>:\oracle\<TARGET_DBSID>\saptrace\usertrace`
   - `<drive>:\oracle\<TARGET_DBSID>\origlogA\cntrl`
   - `<drive>:\oracle\<TARGET_DBSID>\sapdata1\cntrl`
   - `<drive>:\oracle\<TARGET_DBSID>\saparch\cntrl`
   - `<drive>:\oracle\<TARGET_DBSID>\sapcheck`
3. Make sure that the following directories are empty (except the subdirectory `saparch/cntrl`):
   - `<drive>:\oracle\<TARGET_DBSID>\saparch`
   - `<drive>:\oracle\<TARGET_DBSID>\oraarch`
4. Set the security settings for the built-in accounts and groups `SYSTEM`, `Administrators`, `SAP_<SAPSID>_GlobalAdmin` (domain installation), and `SAP_<SAPSID>_LocalAdmin` (local installation) for all directories as follows:
   a. In the Windows Explorer, right-click the Oracle `root` directory and choose *Properties*.
   b. Under *Security*, choose *Advanced*.
   c. Deselect *Allow inheritable permissions from the parent...*.

d. In the next dialog, choose *Copy* to copy the permission entries that were previously applied from the parent to this object.
e. Choose *OK*.
f. Set the permissions for the above-mentioned accounts `SYSTEM`, `Administrators`, `SAP_<DBSID>_GlobalAdmin`, or `SAP_<DBSID>_LocalAdmin` to *Full Control*.
g. Delete all other accounts.

5. Restore the database files on the target system either manually (see Restoring Database Files on the Target System Manually [page 65]) or with BR*Tools (see Restoring the Database Files on the Target System with BR*Tools [page 66]), then proceed with the installer.

5.1.2.3 Restoring 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 by copying the listed files from the source directories to the target directories. For more information, see Creating an Offline Backup Manually [page 68].

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>` **Target (Java only):** `%programfiles%\sapinst_instdir\NW04SR1\WEBAS_COPY\CENTRAL\ONE_HOST` or `%programfiles%\sapinst_instdir\NW04SR1\WEBAS_COPY\DISTRIBUTED\DB`	`CONTROL.SQL`

Source and Target Directory	Files
Source: <INSTDIR> **Target:** \oracle\<DBSID>\<DB_VERSION>_<BIT>\database	init<TARGET_DBSID>.ora

> **Note**
>
> If you use an existing offline backup, the source data files and log files are not located in the directories shown in the table.
>
> The installation directory of the target system is normally located in the directory:
>
> %programfiles%\sapinst_instdir\NW04S\LM\COPY\ORACLE\SYSTEM\<system_variant>

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 control_files parameter of the init<TARGET_DBSID>.ora file.

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

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 Directories on Windows

Source and Target Directory	Files
Source: <INSTDIR> **Target:** <SAPINST_INSTDIR> **Target (Java only):** %programfiles%\sapinst_instdir\NW04SR1\WEBAS_COPY\CENTRAL\ONE_HOST or %programfiles%\sapinst_instdir\NW04SR1\WEBAS_COPY\DISTRIBUTED\DB	CONTROL.SQL
Source: <INSTDIR> **Target:** \oracle\<DBSID>\<DB_VERSION>_<BIT>\database	init<TARGET_DBSID>.ora

2. Call the restore and recovery function of BR*Tools.
   For more information about the required steps and prerequisites, see **SAP Note** 1003028.
   The main prerequisite is that the corresponding BR*Tools logs (BRBACKUP detailed and summary log, BRARCHIVE summary log) are copied manually from the source to the target system. In addition, the postprocessing steps mentioned in this SAP Note are performed automatically by the installer.

SAP Note 1003028 also comprises information about executing restore and recovery under the control of `BRRECOVER` and the exact syntax of `BRRECOVER` (see section *Homogeneous Database Copy*).
For more information about BR*Tools, see the *SAP Library* for your release at:

SAP NetWeaver Release	Location
SAP NetWeaver 7.0	http://help.sap.com/nw70 ▶ *Application Help* ▶ *Function-Oriented View* `<Language>` ▶ *Solution Life Cycle Management by Key Capability* ▶ *General Administration Tasks* ▶ *Database Administration* ▶ *Database Administration for Oracle* ▶ *SAP Database Guide: Oracle* ▶ *BR*Tools for Oracle DBA*
SAP NetWeaver 7.0 including EHP1	http://help.sap.com/nw701 ▶ *Application Help* ▶ *Function-Oriented View* `<Language>` ▶ *Solution Life Cycle Management by Key Capability* ▶ *General Administration Tasks* ▶ *Database Administration* ▶ *Database Administration for Oracle* ▶ *SAP Database Guide: Oracle* ▶ *BR*Tools for Oracle DBA*
SAP NetWeaver 7.0 including EHP2	http://help.sap.com/nw702 ▶ *Application Help* ▶ *Function-Oriented View* `<Language>` ▶ *Solution Life Cycle Management by Key Capability* ▶ *General Administration Tasks* ▶ *Database Administration* ▶ *Database Administration for Oracle* ▶ *SAP Database Guide: Oracle* ▶ *BR*Tools for Oracle DBA*
SAP NetWeaver 7.0 including EHP3	http://help.sap.com/nw703 ▶ *Application Help* ▶ *Function-Oriented View* `<Language>` ▶ *Solution Life Cycle Management by Key Capability* ▶ *General Administration Tasks* ▶ *Database Administration* ▶ *Database Administration for Oracle* ▶ *SAP Database Guide: Oracle* ▶ *BR*Tools for Oracle DBA*

3. Shut down the Oracle database instance as follows:

```
sqlplus /nolog
connect / as sysdba
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 Manually [page 68]
Creating an Offline or Online Backup with BR*Tools [page 68]

5.1.3.1 Creating an Offline Backup Manually

There are different possibilities to prepare 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.
- You 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 step.

> **Note**
>
> If you choose this manual offline backup method, you also have to restore the database files on the target system manually. For more information, see Restoring Database Files on the Target System Manually [page 65].

5.1.3.2 Creating an Offline or Online Backup with BR*Tools

Use

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

> **Caution**
>
> To ensure that no changes are made to the file system during backup, stop the Software Deployment Manager (SDM).

Proceed as described in the *SAP Library* for your release at:

SAP NetWeaver Release	Location
SAP NetWeaver 7.0	http://help.sap.com/nw70 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *Solution Life Cycle Management by Key Capability* ▶ *Database Administration for Oracle* ▶ *SAP Database Guide: Oracle* ▶ *BR*Tools for Oracle DBA* ▶ *BR*Tools in Action* ▶ *Backup and Database Copy with BR*Tools*.
SAP NetWeaver 7.0 including EHP1	http://help.sap.com/nw701 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *Solution Life Cycle Management by Key Capability* ▶ *Database Administration for Oracle* ▶ *SAP Database Guide: Oracle* ▶ *BR*Tools for Oracle DBA* ▶ *BR*Tools in Action* ▶ *Backup and Database Copy with BR*Tools*.
SAP NetWeaver 7.0 including EHP2	http://help.sap.com/nw702 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *Solution Life Cycle Management by Key Capability* ▶ *Database Administration for Oracle* ▶ *SAP Database Guide: Oracle* ▶ *BR*Tools for Oracle DBA* ▶ *BR*Tools in Action* ▶ *Backup and Database Copy with BR*Tools*.
SAP NetWeaver 7.0 including EHP3	http://help.sap.com/nw703 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *Solution Life Cycle Management by Key Capability* ▶ *Database Administration for Oracle* ▶ *SAP Database Guide: Oracle* ▶ *BR*Tools for Oracle DBA* ▶ *BR*Tools in Action* ▶ *Backup and Database Copy with BR*Tools*.

> **Note**
>
> If you choose a backup method with BR*Tools. you also have to restore the database files on the target system with BR*Tools. For more information, see Restoring the Database Files on the Target System with BR*Tools [page 66].

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)
  You are using the SAP MaxDB Database Manager (DBMGUI) version 7.5.0 Build 12 or above. For more information, see:
  http://maxdb.sap.com/doc/7_6/default.htm *Tools* > *Database Manager GUI*
  Alternatively, you can use Database Studio. For more information, see:
  http://maxdb.sap.com/doc/7_7/default.htm *Tools* > *Database Studio*
- 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 installer prompts you, configure the database data volumes according to this value.

Context

The installer 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 installer, 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 installer 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 installer.
- Automatic restore
  The installer 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.

> **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 or Jload [page 33].

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 installer as follows and then follow the prompts:

   `<Product>` *Software Life-Cyle Options* *System Copy* *Target System Installation* `<System Variant>`

2. In the *Select the database copy method* screen, select *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:
     1. Start the data recovery wizard from DBMGUI
        1. Register your database instance in the DBMGUI
        2. Check the database instance in the admin state.
        3. Choose *Recovery* > *Recovery with Initialization ...*
        4. In *type of recovery*, select *Restore a medium.*
        5. Specify the backup medium.
        6. Start the restore procedure.

        > **Note**
        >
        > The recovery wizard does not start the recovery immediately. It initializes the database instance first. It takes some time for the database server to format the database volumes.
     2. After the restore, check the state of the target database instance. Change the database state to online if it is not already in online state.
     3. Delete the entries from the following tables to make sure that information about the backup history for update statistics in the Computing Center Management System (CCMS) from the old system does not appear in the new system:
        `CNHIST`, `CNREPRT`, `CNMEDIA`, `DBSTATHADA`, `DBSTAIHADA`, `DBSTATIADA`, `DBSTATTADA`, `SDBAADAUPD`
     4. Continue with the installer or restart it if you stopped it during the recovery.
   - *Restore by the Installer*
     Enter the following information:
     - *Template name*
     - *Device/file*
     - *Wait for backup*
4. After installation is completed, maintain the database connection for CCMS.

   For more information, see **SAP Note**588515.

5.3 MS SQL Server-Specific Procedure

This section describes how to perform a homogeneous system copy of an MS SQL Server database by using the backup/restore method, or the detach/attach method in an SAP environment. The installer supports both methods.

Context

The backup/restore method and the detach/attach method have the following advantages compared to the R3load method:

- You can use an existing backup.
- These methods are much faster than the database-independent method [page 33].

> **Note**
>
> - For more information about the system copy procedure, see **SAP Notes**193816 and 151603.
> - With SQL Server, you can use backup images across the platforms I386, IA64, x64. That is, you can make a backup on one type of platform and use it on another type.
> - You can attach SQL Server 2000 files to SQL Server 2005 but not vice versa.

Procedure

1. On the source system, run the installer to create an export of the Java central instance [page 38] by choosing the following option on the *Welcome* screen:

   <SAP Product> ▸ *Software Life-Cycle Options* ▸ *System Copy* ▸ *MS SQL Server* ▸ *Source System Export* ▸ *<System Variant>* ▸ *Based on <Technical Stack>*

   - For a central system, choose *Database and Central Instance Export*.

     > **Note**
     >
     > On the installer screen *SAP SystemDatabase Export*, make sure that you select *Use database-specific tools* for the system copy method.

   - For a distributed system, choose *Central Instance Export*.

   When performing the export, create a MIGRATION EXPORT CD image, which contains the data of the exported system, and which you use to install the target system.
2. Detach the database files from the source system database or create a backup and copy the files to the target system.

For more information about backing up your SQL Server database, see the SAP Library at:

http://help.sap.com/nw70 ▶ *<Enhancement Package>* ▶ *Application Help* ▶ *Function-Oriented View: English* ▶ *Database Administration* ▶ *Database Administration for Microsoft SQL Server* ▶ *SAP/ MS SQL Server DBA in CCMS*

3. Attach the database files or restore the backup of the source database on the target database server.
4. Run the installer to install the target system by choosing the following on the *Welcome* screen:

   ▶ *<SAP Product>* ▶ *Software Life-Cycle Options* ▶ *System Copy* ▶ *MS SQL Server* ▶ *Target System Installation* ▶ *<System Variant>* ▶ *Based on <Technical Stack>*

   > **Note**
   >
   > - The target system is installed using the exports from the source system.
   > - Choose the installation services in exactly the order they appear.
   >   For more information, see the MS SQL Server installation guide for your SAP system at:
   >   http://support.sap.com/sltoolset ▶ *System Provisioning* ▶ *Installation Option of Software Provisioning Manager 1.0*.
   > - On the installer screen *SAP SystemDatabase*, make sure that you select *Homogeneous System Copy (MS SQL Server-specific: Detach/Attach or Backup)*.

5.4 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 a Db2 backup can be used cross-platform within certain limitations (see below), this method is not limited to the homogenous system copy only.

> **Note**
>
> This backup/restore procedure described here only works using the installer. System copy using native Db2 backup/restore procedures **without** the installer 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.
- If errors occur when restoring the backup on the target system, the complete restore must be repeated.

Context

An SAP system copy with a Db2 database can be also created 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 installer is used for installation on the target system host as described in the installation documentation for your SAP component. Before starting the installer 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 appropriate installation guide at http://support.sap.com/sltoolset > *System Provisioning* > *Installation Option of Software Provisioning Manager* >

You also have to run an export for the Java Engine to archive SDM and application-specific file system content.

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 33].

Disadvantages of the Backup Method

- You cannot change the name of the database schema. The name of the database schema of the target system 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 `MCOD` component to another system. You can only copy the complete system.

Procedure

1. You perform an online or offline backup.

   > **Note**
   >
   > 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. To do so, use the `INCLUDE LOGS` option of the **`BACKUP DATABASE`** command. Logs are by default included in an online backup.

   > **Note**
   >
   > To export the database content for Java, you can also use the database-specific method (backup/restore).
   >
   > During the *Define Parameters* phase, the installer asks you in the *Database Export* dialog box to specify the system copy method. If you want to use the backup/restore method, choose *Use database-specific tools*.

2. To create the export directory structure with labels and to archive SDM and application-specific file system content, you also have to run the installer.

   On the *Welcome* screen, choose ▶ `<Product>` ▶ *Software Life-Cycle Options* ▶ *System Copy* ▶ *IBM Db2 for Linux, UNIX, and Windows* ▶ *Source System Export* ▶ `<System_Variant>` ▶ *Based on* `<Technical_Stack>` ▶.

   Perform the installation options in the given sequence and follow the instructions on the installer dialogs.
3. To create a target system, run the installer on the target system host by choosing the following on the *Welcome* screen: ▶ `<Product>` ▶ *Software Life-Cycle Options* ▶ *System Copy* ▶ *IBM Db2 for Linux, UNIX, and Windows* ▶ *Target System Installation* ▶ `<System_Variant>` ▶ *Based on* `<Technical_Stack>` ▶

   Perform the installation options in the given sequence and follow the instructions on the installer dialogs. The installer prompts you to perform the database restore during the installation phase.

   > ### ⚠ 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*.
4. 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.
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 Db2 documentation *Db2 Command Reference*.

     > ### ℹ Note
     >
     > With a simple restore, you cannot change the name or 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.
     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*.
You cannot use the `brdb6brt` tool to perform a redirected restore.

> **Note**
>
> You do not have to export the database content for backup/restore with Jload. During the dialog phase, the installer asks if you want to export the database content using database tools or using Jload. If you choose the database tools, Jload is not used.
>
> For more information, see SAP Note 1238351.

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 roll forward operation to bring the database into a consistent state.

You can now continue with the installation.

Next Steps

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

- 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)
  - `JDK_PATH` (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* and *Database Administration Using the DBA Cockpit: IBM Db2 for Linux, UNIX, and Windows*. To access this guide, use the SAP NetWeaver Guide Finder: In the I want to column select Operate my system, in the My Database column, select IBM Db2 for Linux, UNIX, and Windows.
- 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

5.5 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 33].

Restriction of the Offline System Copy Method

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

> **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

5.5.1 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 ENVIRONMENT`s of DB2 procedures must be altered in the target system. Identify all created procedures and `WLM ENVIRONMENT`s 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:

> **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 81] of this process flow has been completed successfully.

5.5.2 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 `DSNTIJMV` to update the `DB2 PROCLIB`.

5.5.3 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 81] of this process flow.

5.5.4 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.

5.5.5 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.

5.5.6 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, .

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

Use DB2 utility DSNJU003 to delete obsolete and invalid DSNAME entries using the DELETE DSNAME parameter. In the same job you can define the name of the new logcopy data sets with the NEWLOG DSNAME 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.

5.5.8 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.

5.5.9 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.

5.5.10 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 83] 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 83].

For data sharing systems, start the first member and continue with Step 11: Update the DB2 Catalog Using CATMAINT UPDATE VCAT SWITCH [page 83].

5.5.11 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.

5.5.12 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 84] if problems occur while the target system is being stopped or restarted.

5.5.13 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.

5.5.14 Step 14: Alter All WLM Environments of Stored Procedures

Use

In step 1 [page 79] 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.

5.5.15 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.SYSUERAUTH;`
   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.

5.6 SAP ASE Server-Specific Procedure

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

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 backup.
- You can copy the complete database software and database devices (all files below `<Drive>:\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 33].

For more information about system copy with SAP ASE 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 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 command **`quiesce database <DBSID>_tag release`**).
   - Create a backup (SAP ASE command `dump database`).
2. Copy the files to the target system.
3. Run the installer to install the target system by choosing the following on the *Welcome* screen:

   `<Product>` ▸ *Software Life-Cycle Options* ▸ *System Copy* ▸ `<Database>` ▸ *Target System Installation* ▸ `<System Variant>` ▸ *Based on* `<Technical Stack>`

   > **Note**
   >
   > - Choose the installation services in exactly the order they appear. For more information, see the SAP ASE installation guide for your SAP NetWeaver-based system at: http://support.sap.com/sltoolset ▸ *System Provisioning* ▸ *Installation Option*.
   > - On the installer screen *SAP SystemDatabase*, make sure that you select *Homogeneous System Copy (SAP ASE-specific: Attach database device or Load database dump)*.
   > - The installer 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 installer tries to find the database devices mentioned in the manifest file automatically, otherwise it asks for the files during the installer execution phase.

6 Follow-Up Activities

To finish the system copy of your SAP system, perform the follow-up activities described in the following sections.

> **Note**
>
> The Java engine is not started automatically. After the target system has been installed and the follow-up activities have been performed, you have to start the Java engine manually.

Related Information

Performing Follow-Up Activities in the Target System [page 88]

7 Performing Follow-Up Activities in the Target System

You have to perform the following follow-up activities in the target system.

> **Note**
>
> Before you start the Java engine after the system copy, apply **SAP Note** 831812 and if necessary, change the Java VM parameters as described in **SAP Note** 723909

Related Information

Installing the License Key [page 88]
SAP Solution Manager: Connection Between SLD and LMDB [page 89]
Performing Follow-Up Activities for Java [page 90]
Checking the Database Parameters for IBM Db2 for Linux, UNIX, and Windows [page 120]

7.1 Installing the License Key

Once the installation of the target system is completed and the SAP system copy has been imported, 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.

> **Caution**
>
> - **Before** the temporary license expires, you must apply for a permanent license key from SAP. We recommend that you apply for a permanent license key as soon as possible after installing your system.
> - **Before** installing the license key, make sure that **SAP Note** 831812 is applied.

For more information about ordering and installing the SAP license, see the *SAP Library* for your release at:

SAP NetWeaver Release	Location
SAP NetWeaver 7.0	http://help.sap.com/nw70 ▶ *Application Help* ▶ *SAP NetWeaver by Key Capability* ▶ *Solution Life Cycle Management* ▶ *SAP Licenses*

SAP NetWeaver Release	Location
SAP NetWeaver 7.0 including EHP1	http://help.sap.com/nw701 ▶ *Application Help* > *SAP NetWeaver by Key Capability* > *Solution Life Cycle Management* > *SAP Licenses*
SAP NetWeaver 7.0 including EHP2	http://help.sap.com/nw702 ▶ *Application Help* > *SAP NetWeaver by Key Capability* > *Solution Life Cycle Management* > *SAP Licenses*
SAP NetWeaver 7.0 including EHP3	http://help.sap.com/nw703 ▶ *Application Help* > *SAP NetWeaver by Key Capability* > *Solution Life Cycle Management* > *SAP Licenses*

More Information

For more information about SAP license keys, see https://support.sap.com/en/my-support/keys.html.

7.2 SAP Solution Manager: Connection Between SLD and LMDB

- Consider the following if you move parts of a system, for example the database, or the complete system to new hardware:
  - Each change in the host name generates new elements in the system landscape directory (SLD) which can result in system duplicates.
  - SAP recommends using stable (virtual) host names which remain constant over time, in the system profiles. SAP Note 1052122 lists the profile parameters evaluated by the SLD Data Suppliers for the host names.
- If you omitted to use virtual host names at installation time or if you cannot use virtual host names now, the SLD offers a possibility to prevent the creation of system duplicates. For more information, see SAP Note 1727294.
- If you cannot apply SAP Note 1727294 to the SLD, and if you already found a duplicate registration for the system in the SLD, refer to SAP Note 1694004 for guidance how to clean up such inconsistencies. SAP Note 1747926 describes the cleanup procedure for older SLD releases.
- If you want to copy an SAP Solution Manager system with a filled Landscape Management Database (LMDB), see SAP Note 1797014.
- If you want to create a new synchronization connection between the Landscape Management Database (LMDB) and the System Landscape Directory (SLD), see SAP Note 1699142.
- If you want to delete a synchronization connection between two SLD systems or between an SLD system and LMDB, see SAP Note 1770691.

7.3 Performing Follow-Up Activities for Java

Depending on the usage types or software units contained in your target system, you have to perform general and usage type or software unit-specific configuration steps.

Related Information

Usage Type or Software Unit-Specific Follow-Up Activities [page 94]
Activities at Database Level [page 90]

7.3.1 Activities at Database Level

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

Procedure

Oracle Database only If you have chosen to enable Oracle Database Vault, make sure that you perform the required configuration steps. For more information, see Implementing Oracle Database Vault with the Installer [page 135].

7.4 General Follow-Up Activities

This section contains general follow-up activities for SAP systems based on AS Java.

> **Note**
>
> You can use Java post-copy automation (PCA) to perform general follow-up activities automatically. Java 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 1807150.
>
> 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.

Related Information

Configuration Steps for the SAP Java Connector [page 91]
Generating Public-Key Certificates [page 92]

7.4.1 Configuration Steps for the SAP Java Connector

You need to perform these post-installation steps for a copied Java system that includes a component that has to connect to an ABAP back end using the SAP Java Connector (SAP JCo), for example SAP NetWeaver Business Warehouse or SAP NetWeaver Portal.

Procedure

1. Log on to the Visual Administrator as an administrator.
2. On the launch path on the left, choose *Cluster* > *Server <server name>* > *Services* > *JCo RFC Provider* .
3. On the right, choose *Runtime* and select the RFC destination that you use for the connection to the back end.
4. Maintain the required parameters for the RFC destination and repository.
5. Remove the old JCo-destination that was copied from the source system.
6. Restart the Java server and the component.

7.4.2 Generating Public-Key Certificates

Reconfiguring the Public-Key Certificates

After system copy, the public key certificates are wrong on the target system. You need to reconfigure them as described in the *SAP Library* for your release at:

SAP NetWeaver Release	Location
SAP NetWeaver 7.0	http://help.sap.com/nw70 ▶ *Application Help* ▶ *SAP NetWeaver by Key Capability* ▶ *Security* ▶ *User Authentication and Single Sign-On* ▶ *Authentication on the AS Java* ▶ *Configuring Authentication Mechanisms* ▶ *Using Logon Tickets for Single Sign-On* ▶ *Configuring the Use of Logon Tickets* ▶ *Replacing the Key Pair to Use for Logon Tickets*
SAP NetWeaver 7.0 including EHP1	http://help.sap.com/nw701 ▶ *Application Help* ▶ *SAP NetWeaver by Key Capability* ▶ *Security* ▶ *User Authentication and Single Sign-On* ▶ *Authentication on the AS Java* ▶ *Configuring Authentication Mechanisms* ▶ *Using Logon Tickets for Single Sign-On* ▶ *Configuring the Use of Logon Tickets* ▶ *Replacing the Key Pair to Use for Logon Tickets*
SAP NetWeaver 7.0 including EHP2	http://help.sap.com/nw702 ▶ *Application Help* ▶ *SAP NetWeaver by Key Capability* ▶ *Security* ▶ *User Authentication and Single Sign-On* ▶ *Authentication on the AS Java* ▶ *Configuring Authentication Mechanisms* ▶ *Using Logon Tickets for Single Sign-On* ▶ *Configuring the Use of Logon Tickets* ▶ *Replacing the Key Pair to Use for Logon Tickets*
SAP NetWeaver 7.0 including EHP3	http://help.sap.com/nw703 ▶ *Application Help* ▶ *SAP NetWeaver by Key Capability* ▶ *Security* ▶ *User Authentication and Single Sign-On* ▶ *Authentication on the AS Java* ▶ *Configuring Authentication Mechanisms* ▶ *Using Logon Tickets for Single Sign-On* ▶ *Configuring the Use of Logon Tickets* ▶ *Replacing the Key Pair to Use for Logon Tickets*

Importing the Public-Key Certificates

You also need to import this public-key certificate on any systems that are to accept logon tickets from the AS Java system. For more information, see the *SAP Library* for your release at:

SAP NetWeaver Release	Location
SAP NetWeaver 7.0	http://help.sap.com/nw70 ▶ *Application Help* ▶ *SAP NetWeaver by Key Capability* ▶ *Security* ▶ *User Authentication and Single Sign-On* ▶ *Authentication on the AS Java* ▶ *Configuring Authentication Mechanisms* ▶ *Using Logon Tickets for Single Sign-On* ▶ *Configuring the Use of Logon Tickets* ▶ *Configuring SAP Web AS ABAP to Accept Logon Tickets from the J2EE*
SAP NetWeaver 7.0 including EHP1	http://help.sap.com/nw701 ▶ *Application Help* ▶ *SAP NetWeaver by Key Capability* ▶ *Security* ▶ *User Authentication and Single Sign-On* ▶ *Authentication on the AS Java* ▶ *Configuring Authentication Mechanisms* ▶ *Using Logon Tickets for Single Sign-On* ▶ *Configuring the Use of Logon Tickets* ▶ *Configuring SAP Web AS ABAP to Accept Logon Tickets from the J2EE*
SAP NetWeaver 7.0 including EHP2	http://help.sap.com/nw702 ▶ *Application Help* ▶ *SAP NetWeaver by Key Capability* ▶ *Security* ▶ *User Authentication and Single Sign-On* ▶ *Authentication on the AS Java* ▶ *Configuring Authentication Mechanisms* ▶ *Using Logon Tickets for Single Sign-On* ▶ *Configuring the Use of Logon Tickets* ▶ *Configuring SAP Web AS ABAP to Accept Logon Tickets from the J2EE*
SAP NetWeaver 7.0 including EHP3	http://help.sap.com/nw703 ▶ *Application Help* ▶ *SAP NetWeaver by Key Capability* ▶ *Security* ▶ *User Authentication and Single Sign-On* ▶ *Authentication on the AS Java* ▶ *Configuring Authentication Mechanisms* ▶ *Using Logon Tickets for Single Sign-On* ▶ *Configuring the Use of Logon Tickets* ▶ *Configuring SAP Web AS ABAP to Accept Logon Tickets from the J2EE*

7.5 Usage Type or Software Unit-Specific Follow-Up Activities

This section includes the steps that you have to perform for specific usage types or software units.

Related Information

EP Core (EPC) [page 94]
Enterprise Portal (EP) [page 97]
Business Intelligence Java Components (BI Java) [page 113]
Development Infrastructure (DI) [page 115]
Self Services (XSS) [page 117]
CRM Java Components (JCRM) / Extended E-Selling Components (XECO) [page 118]
SRM Live Auction Cockpit (SRMLAC) [page 119]
SCM Forecasting & Replenishment Processor (SCM FRP) [page 119]

7.5.1 EP Core (EPC)

Related Information

EPC: Portal [page 94]
Configuring the Portal Content [page 95]

7.5.1.1 EPC: Portal

After system copy, you have to perform some follow-up activities for Enterprise Portal Core.

If trust between a portal and any other system is required, then you need to replace certificates and reestablish trust with the new system on which the portal is installed. For more information, see Generating Public-Key Certificates [page 92].

If you have more than one portal in your landscape and the portals share content via a federated portal network (FPN), see **SAP Note** 1080080 for more information about follow-up activities.

7.5.1.2 Configuring the Portal Content

Use

After the system copy, the SAP<SAPSID> has changed, but the *Logical System* ID of the portal system object in the system landscape still points to the old SAP<SAPSID>. You have to modify it to point to the correct SAP<SAPSID> by updating the *Logical System* name.

For more information about the *Logical System* names, see the SAP Library for your release at:

SAP NetWeaver Release	Location
SAP NetWeaver 7.0	http://help.sap.com/nw70 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *Information Integration: Key Areas* ▶ *Business Intelligence* ▶ *Data Warehousing* ▶ *Data Acquisition* ▶ *Source System* ▶ *Connection between Source Systems and BW* ▶ *Logical System Names*
SAP NetWeaver 7.0 including EHP1	http://help.sap.com/nw701 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *Information Integration by Key Capability* ▶ *Business Intelligence* ▶ *Data Warehousing* ▶ *Data Acquisition* ▶ *Source System* ▶ *Connection between Source Systems and BW* ▶ *Logical System Names*
SAP NetWeaver 7.0 including EHP2	http://help.sap.com/nw702 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *Information Integration by Key Capability* ▶ *Business Intelligence* ▶ *Data Warehousing* ▶ *Data Staging* ▶ *Source System* ▶ *Connection between Source Systems and BW* ▶ *Logical System Names*
SAP NetWeaver 7.0 including EHP3	http://help.sap.com/nw702 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *Information Integration by Key Capability* ▶ *Business Intelligence* ▶ *Data Warehousing* ▶ *Modeling* ▶ *Data Acquisition* ▶ *Source System* ▶ *Connection between Source Systems and BW* ▶ *Logical System Names*

Since the system alias has to be the same as the *Logical System* name, you have to update it, too.

For more information about the system aliases, see the SAP Library for your release at:

SAP NetWeaver Release	Location
SAP NetWeaver 7.0	http://help.sap.com/nw70 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *People Integration by Key Capability* ▶ *Portal Administration Guide* ▶ *System Administration* ▶ *System Configuration* ▶ *System Landscape* ▶ *System Aliases*
SAP NetWeaver 7.0 including EHP1	http://help.sap.com/nw701 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *People Integration by Key Capability* ▶ *Portal Administration Guide* ▶ *System Administration* ▶ *System Configuration* ▶ *System Landscape* ▶ *System Aliases*
SAP NetWeaver 7.0 including EHP2	http://help.sap.com/nw702 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *People Integration by Key Capability* ▶ *Portal Administration Guide* ▶ *System Administration* ▶ *System Configuration* ▶ *System Landscape* ▶ *System Aliases*
SAP NetWeaver 7.0 including EHP3	http://help.sap.com/nw703 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *People Integration by Key Capability* ▶ *Portal Administration Guide* ▶ *System Administration* ▶ *System Configuration* ▶ *System Landscape* ▶ *System Aliases*

Procedure

Proceed in one of the following ways:

- Update the information in the existing system.
  All parameters that contain information about the old system have to be updated to point to the new system. That is, if the host name or the port has been changed, the system object has to be updated accordingly.
  1. Update the *Logical System* name to point to the new system `SAP<SAPSID>`.
  2. Update the system alias to be the same as the new *Logical System* name.
  3. Set the new system alias to be default.
  4. Update all relevant properties of the host and the ports values of the old systems.
  5. Change the ID/name of the old system.

After the value of the alias has been updated, the old content will not work, because it still points to the old alias. Moreover, all new role uploads from the new system will be created under a new folder and will not overwrite the existing one.
Therefore, you also have to change the ID values of the folders of the migrated content and the system value of the uploaded content.

- Create a new system that points to the new environment. For more information, see the SAP Library for your release at:

SAP NetWeaver Release	Location
SAP NetWeaver 7.0	http://help.sap.com/nw70 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *People Integration by Key Capability* ▶ *Portal Administration Guide* ▶ *System Administration* ▶ *Upload of Roles from ABAP-Based Systems*
SAP NetWeaver 7.0 including EHP1	http://help.sap.com/nw701 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *People Integration by Key Capability* ▶ *Portal Administration Guide* ▶ *System Administration* ▶ *Upload of Roles from ABAP-Based Systems*
SAP NetWeaver 7.0 including EHP2	http://help.sap.com/nw702 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *People Integration by Key Capability* ▶ *Portal Administration Guide* ▶ *System Administration* ▶ *Upload of Roles from ABAP-Based Systems*
SAP NetWeaver 7.0 including EHP3	http://help.sap.com/nw703 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *People Integration by Key Capability* ▶ *Portal Administration Guide* ▶ *System Administration* ▶ *Upload of Roles from ABAP-Based Systems*

Make sure that you update the ID values of the folders of the migrated content and the system value of the uploaded content.

7.5.2 Enterprise Portal (EP)

Related Information

EP: Knowledge Management and Collaboration [page 98]

7.5.2.1 EP: Knowledge Management and Collaboration

Use

After the system copy, the Knowledge Management and Collaboration (KMC) target system still has access to the same data as the original source system. If the source and target system have write access to the same data, this results in serious inconsistencies in both systems. For this reason, it is essential to prevent both systems from using the same data.

Critical items that are accessed by both systems are, for example:

- Indexes for search and classification (TREX)
- Data in external repositories, for example, on file system shares
- Data on groupware servers

> **Note**
>
> **SAP NetWeaver 7.0 SR3/EHP1 SR1, Java only:** If content exchange is configured on the source system, the same configuration exists on the target system after the system copy. However, in most cases, it does not makes sense to have the same configuration on both the source and target system. For this reason, you need to remove the configuration on the target system with the help of acleanup script and then set up a new configuration. The cleanup script is available as an attachment to SAP Note 883859.

Procedure

To prevent source and target system from working with the same data, reconfigure the following components on the target system:

- TREX
- Repository Managers
- Services
- Collaboration

The tables below summarize the configuration steps for each of the components and specify where you can find more information.

TREX

After the system copy, the target system is still connected to the same TREX installation as the source system. For this reason you need to install a new instance of TREX and connect it to the target system.

> ### Caution
>
> While KMC is still connected to the old TREX installation, do not delete any indexes, otherwise they will also be deleted on the source system.

Task	Detailed Information
For the target system, install a new instance of TREX.	https://help.sap.com/trex

Task	Detailed Information

On the target system, set up the connection to the newly installed TREX system.
 	
TREX <version> for SAP NetWeaver 7.0
	For more information, see the *SAP Library* for your release at:
	
	• **SAP NetWeaver 7.0**:
	  ○ TREX 7.0
	  http://help.sap.com/nw70 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *Information Integration: Key Areas* ▶ *Search and Classification TREX* ▶ *TREX 7.0 for SAP NetWeaver 7.0* ▶ *TREX Configuration* ▶ *Post-Installation Configuration* ▶ *Client Side* ▶ *Java Application (HTTP Connection)* ▶ *Specifying the Address of the TREX Name Server*
	  ○ TREX 7.1
	  http://help.sap.com/nw70 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *Information Integration: Key Areas* ▶ *Search and Classification TREX* ▶ *TREX 7.1 for SAP NetWeaver 7.0* ▶ *TREX Configuration* ▶ *TREX Basic Configuration* ▶ *Connecting TREX with an Application* ▶ *Connecting TREX with a Java Application (HTTP Connection)* ▶ *Specifying the Address of the TREX Name Server*
	• **SAP NetWeaver including EHP1**:
	  ○ TREX 7.0
	  http://help.sap.com/nw701 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *Information Integration by Key Capability* ▶ *Search* ▶ *Search and Classification TREX* ▶ *TREX 7.0 for SAP NetWeaver 7.0* ▶ *TREX Configuration* ▶ *Post-Installation Configuration* ▶ *Client Side* ▶ *Java Application (HTTP Connection)* ▶ *Specifying the Address of the TREX Name Server*
	  ○ TREX 7.1
	  http://help.sap.com/nw701 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *Information Integration by Key Capability* ▶ *Search* ▶ *Search and Classification TREX* ▶ *TREX 7.1 for SAP NetWeaver 7.0* ▶ *TREX Configuration* ▶ *TREX*

Task	Detailed Information

	Basic Configuration > *Connecting TREX with an Application* > *Connecting TREX with a Java Application (HTTP Connection)* > *Specifying the Address of the TREX Name Server*
	• **SAP NetWeaver including EHP2**:
	  ○ TREX 7.0
	  http://help.sap.com/nw702 > *Application Help* > *Function-Oriented View <Language>* > *Information Integration by Key Capability* > *Search* > *Search and Classification TREX* > *TREX 7.0 for SAP NetWeaver 7.0* > *TREX Configuration* > *Post-Installation Configuration* > *Client Side* > *Java Application (HTTP Connection)* > *Specifying the Address of the TREX Name Server*
	  ○ TREX 7.1
	  http://help.sap.com/nw702 > *Application Help* > *Function-Oriented View <Language>* > *Information Integration by Key Capability* > *Search* > *Search and Classification TREX* > *TREX 7.1 for SAP NetWeaver 7.0* > *TREX Configuration* > *TREX Basic Configuration* > *Connecting TREX with an Application* > *Connecting TREX with a Java Application (HTTP Connection)* > *Specifying the Address of the TREX Name Server*
	• **SAP NetWeaver including EHP3**:
	  ○ TREX 7.0
	  http://help.sap.com/nw703 > *Application Help* > *Function-Oriented View <Language>* > *Information Integration by Key Capability* > *Search and Operational Analytics* > *Other Search Technology* > *Search and Classification TREX* > *TREX 7.0 for SAP NetWeaver 7.0* > *TREX Configuration* > *Post-Installation Configuration* > *Client Side* > *Java Application (HTTP Connection)* > *Specifying the Address of the TREX Name Server*
	  ○ TREX 7.1

Task	Detailed Information
	http://help.sap.com/nw703 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *Information Integration by Key Capability* ▶ *Search and Operational Analytics* ▶ *Other Search Technology* ▶ *Search and Classification TREX* ▶ *TREX 7.1 for SAP NetWeaver 7.0* ▶ *TREX Configuration* ▶ *TREX Basic Configuration* ▶ *Connecting TREX with an Application* ▶ *Connecting TREX with a Java Application (HTTP Connection)* ▶ *Specifying the Address of the TREX Name Server*
On the target system, delete old indexes that belong to the source system. Define and generate new indexes for the target system. **Note** The prerequisite for this step is that all repository managers are configured correctly for the target system.	For more information, see the *SAP Library* for your release at: • **SAP NetWeaver 7.0**: http://help.sap.com/nw70 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *Information Integration: Key Areas* ▶ *Knowledge Management* ▶ *Administration Guide* ▶ *System Administration* ▶ *System Configuration* ▶ *'Index Administration' iView* • **SAP NetWeaver including EHP1**: http://help.sap.com/nw701 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *Information Integration by Key Capability* ▶ *Knowledge Management* ▶ *Administration Guide* ▶ *System Administration* ▶ *System Configuration* ▶ *'Index Administration' iView* • **SAP NetWeaver including EHP2**: http://help.sap.com/nw702 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *Information Integration by Key Capability* ▶ *Knowledge Management* ▶ *Administration Guide* ▶ *System Administration* ▶ *System Configuration* ▶ *'Index Administration' iView* • **SAP NetWeaver including EHP3**: http://help.sap.com/nw703 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *Information Integration by Key Capability* ▶ *Knowledge Management* ▶ *Administration Guide* ▶ *System Administration* ▶ *System Configuration* ▶ *'Index Administration' iView*

Repository Managers

Ensure that the target system does not have write access to the same repositories as the source system.

Task	Detailed Information
On the target system, check the configuration of all **external** and **internal** repository managers that have write access to the same data as the source system. Make sure that the source and target system do not have write access to the same data. For example, check the repository manager settings for: • `CM FSDB` or `CM DBFS` repositories • Simple File System repositories	For more information, see the *SAP Library* for your release at: • **SAP NetWeaver 7.0**: http://help.sap.com/nw70 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *Information Integration: Key Areas* ▶ *Knowledge Management* ▶ *Administration Guide* ▶ *System Administraton* ▶ *System Configuration* ▶ *Content Management Configuration* ▶ *Repositories and Repository Managers* ▶ *External Repositories* • **SAP NetWeaver 7.0 including EHP1**: http://help.sap.com/nw701 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *Information Integration by Key Capability* ▶ *Knowledge Management* ▶ *Administration Guide* ▶ *System Administraton* ▶ *System Configuration* ▶ *Content Management Configuration* ▶ *Repositories and Repository Managers* ▶ *External Repositories* • **SAP NetWeaver 7.0 including EHP2**: http://help.sap.com/nw702 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *Information Integration by Key Capability* ▶ *Knowledge Management* ▶ *Administration Guide* ▶ *System Administraton* ▶ *System Configuration* ▶ *Content Management Configuration* ▶ *Repositories and Repository Managers* ▶ *External Repositories* • **SAP NetWeaver 7.0 including EHP3**: http://help.sap.com/nw703 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *Information Integration by Key Capability* ▶ *Knowledge Management* ▶ *Administration Guide* ▶ *System Administraton* ▶ *System Configuration* ▶ *Content Management Configuration* ▶ *Repositories and Repository Managers* ▶ *External Repositories*

Services

Task	Detailed Information
Content Exchange If content exchange is in use, the configuration on the source and target system is identical. However, it does not make sense to have the same content exchange procedures configured twice. For this reason, delete the configuration on the target system and, if required, set up a new configuration. Run a cleanup file to remove the existing configuration on the target system: • Download the cleanup file attached to **SAP Note** 1238351. Note that the cleanup procedure automatically creates a new ID for a syndicator and subscriber. • Import the cleanup file into the target portal. To do this, choose *System Administration* > *System Configuration* > *Knowledge Management* > *Content Management* and then, on the right, choose *Actions* > *Import*. • If required, configure new content exchange settings on the target system.	For more information, see the *SAP Library* for your release at: • **SAP NetWeaver 7.0**: http://help.sap.com/nw70 > *Application Help* > *Function-Oriented View <Language>* > *Information Integration: Key Areas* > *Knowledge Management* > *Administration Guide* > *System Administration* > *System Configuration* > *Content Management Configuration* > *Global Services* > *Content Exchange Service* • **SAP NetWeaver 7.0 including EHP1**: http://help.sap.com/nw701 > *Application Help* > *Function-Oriented View <Language>* > *Information Integration by Key Capability* > *Knowledge Management* > *Administration Guide* > *System Administration* > *System Configuration* > *Content Management Configuration* > *Global Services* > *Content Exchange Service* • **SAP NetWeaver 7.0 including EHP2**: http://help.sap.com/nw702 > *Application Help* > *Function-Oriented View <Language>* > *Information Integration by Key Capability* > *Knowledge Management* > *Administration Guide* > *System Administration* > *System Configuration* > *Content Management Configuration* > *Global Services* > *Content Exchange Service* • **SAP NetWeaver 7.0 including EHP3**: http://help.sap.com/nw703 > *Application Help* > *Function-Oriented View <Language>* > *Information Integration by Key Capability* > *Knowledge Management* > *Administration Guide* > *System Administration* > *System Configuration* > *Content Management Configuration* > *Global Services* > *Content Exchange Service*

Task	Detailed Information
URL Generator On the target system, check the settings for the `Host` and `Alternative Host` parameters.	For more information, see the *SAP Library* for your release at: • **SAP NetWeaver 7.0**: http://help.sap.com/nw70 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *Information Integration: Key Areas* ▶ *Knowledge Management* ▶ *Administration Guide* ▶ *System Administration* ▶ *System Configuration* ▶ *Content Management Configuration* ▶ *Global Services* ▶ *URL Generator Service* ▶ • **SAP NetWeaver 7.0 including EHP1**: http://help.sap.com/nw701 ▶ *Application Help* ▶ *Function-Oriented View: English* ▶ *Information Integration by Key Capability* ▶ *Knowledge Management* ▶ *Administration Guide* ▶ *System Administration* ▶ *System Configuration* ▶ *Content Management Configuration* ▶ *Global Services* ▶ *URL Generator Service* ▶ • **SAP NetWeaver 7.0 including EHP2**: http://help.sap.com/nw702 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *Information Integration by Key Capability* ▶ *Knowledge Management* ▶ *Administration Guide* ▶ *System Administration* ▶ *System Configuration* ▶ *Content Management Configuration* ▶ *Global Services* ▶ *URL Generator Service* ▶ • **SAP NetWeaver 7.0 including EHP3**: http://help.sap.com/nw703 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *Information Integration by Key Capability* ▶ *Knowledge Management* ▶ *Administration Guide* ▶ *System Administration* ▶ *System Configuration* ▶ *Content Management Configuration* ▶ *Global Services* ▶ *URL Generator Service* ▶

Task	Detailed Information
System Landscape: On the target system, delete the old system IDs that belong to the source system.	Log on to the Portal and choose *System Administration* > *System Configuration* > *Knowledge Management* > *Content Management* > *Global Services* > *System Landscape Definitions* > *Systems* > *Content Management Systems*.
Scheduler Service: If the target system is an SAP Java cluster, then you must assign scheduler tasks to the new system IDs of the target system. After the system copy, tasks are still assigned to the IDs of the source system.	For more information, see the *SAP Library* for your release at: • **SAP NetWeaver 7.0**: http://help.sap.com/nw70 > *Application Help* > *Function-Oriented View <Language>* > *Information Integration: Key Areas* > *Knowledge Management* > *Administration Guide* > *Minimal Configuration for Knowledge Management* > *Cluster Only: Assigning Tasks to Nodes* • **SAP NetWeaver 7.0 including EHP1**: http://help.sap.com/nw701 > *Application Help* > *Function-Oriented View <Language>* > *Information Integration by Key Capability* > *Knowledge Management* > *Administration Guide* > *Minimal Configuration for Knowledge Management* > *Cluster Only: Assigning Tasks to Nodes* • **SAP NetWeaver 7.0 including EHP2**: http://help.sap.com/nw702 > *Application Help* > *Function-Oriented View <Language>* > *Information Integration by Key Capability* > *Knowledge Management* > *Administration Guide* > *Minimal Configuration for Knowledge Management* > *Cluster Only: Assigning Tasks to Nodes* • **SAP NetWeaver 7.0 including EHP3**: http://help.sap.com/nw703 > *Application Help* > *Function-Oriented View <Language>* > *Information Integration by Key Capability* > *Knowledge Management* > *Administration Guide* > *Minimal Configuration for Knowledge Management* > *Cluster Only: Assigning Tasks to Nodes*

Collaboration

Task	Detailed Information
On the target system, adapt the room back-end properties `server address`, `server port`, and `Web protocol`.	For more information, see the *SAP Library* for your release at: • **SAP NetWeaver 7.0**: http://help.sap.com/nw70 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *People Integration by Key Capability* ▶ *Collaboration* ▶ *Administration Guide* ▶ *Making Rooms Available in the Portal* ▶ *Preparing Rooms for Use* ▶ *Defining the Web Address and Automatic E-Mail Dispatch for Rooms* • **SAP NetWeaver 7.0 including EHP1**: http://help.sap.com/nw701 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *People Integration by Key Capability* ▶ *Collaboration* ▶ *Administration Guide* ▶ *Making Rooms Available in the Portal* ▶ *Preparing Rooms for Use* ▶ *Defining the Web Address and Automatic E-Mail Dispatch for Rooms* • **SAP NetWeaver 7.0 including EHP2**: http://help.sap.com/nw702 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *People Integration by Key Capability* ▶ *Collaboration* ▶ *Administration Guide* ▶ *Making Rooms Available in the Portal* ▶ *Preparing Rooms for Use* ▶ *Defining the Web Address and Automatic E-Mail Dispatch for Rooms* • **SAP NetWeaver 7.0 including EHP3**: http://help.sap.com/nw703 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *People Integration by Key Capability* ▶ *Collaboration* ▶ *Administration Guide* ▶ *Making Rooms Available in the Portal* ▶ *Preparing Rooms for Use* ▶ *Defining the Web Address and Automatic E-Mail Dispatch for Rooms*

Task	Detailed Information
On the target system, generate a new index to enable search operations in the content of rooms.	• **SAP NetWeaver 7.0**: http://help.sap.com/nw70 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *People Integration by Key Capability* ▶ *Collaboration* ▶ *Administration Guide* ▶ *Making Rooms Available in the Portal* ▶ *Preparing Rooms for Use* ▶ *Configuring the Search for Room Content* • **SAP NetWeaver 7.0 including EHP1**: http://help.sap.com/nw701 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *People Integration by Key Capability* ▶ *Collaboration* ▶ *Administration Guide* ▶ *Making Rooms Available in the Portal* ▶ *Preparing Rooms for Use* ▶ *Configuring the Search for Room Content* • **SAP NetWeaver 7.0 including EHP2**: http://help.sap.com/nw702 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *People Integration by Key Capability* ▶ *Collaboration* ▶ *Administration Guide* ▶ *Making Rooms Available in the Portal* ▶ *Preparing Rooms for Use* ▶ *Configuring the Search for Room Content* • **SAP NetWeaver 7.0 including EHP3**: http://help.sap.com/nw703 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *People Integration by Key Capability* ▶ *Collaboration* ▶ *Administration Guide* ▶ *Making Rooms Available in the Portal* ▶ *Preparing Rooms for Use* ▶ *Configuring the Search for Room Content*

Task	Detailed Information
On the target system, check the properties of the `roomsearch` object. Make sure that the parameter `Use TREX` is set.	• **SAP NetWeaver 7.0**: http://help.sap.com/nw70 *Application Help* > *Function-Oriented View <Language>* > *People Integration by Key Capability* > *Collaboration* > *Administration Guide* > *Making Rooms Available in the Portal* > *Preparing Rooms for Use* > *Configuring the Search for Room Content* • **SAP NetWeaver 7.0 including EHP1**: http://help.sap.com/nw701 *Application Help* > *Function-Oriented View <Language>* > *People Integration by Key Capability* > *Collaboration* > *Administration Guide* > *Making Rooms Available in the Portal* > *Preparing Rooms for Use* > *Configuring the Search for Room Content* • **SAP NetWeaver 7.0 including EHP2**: http://help.sap.com/nw702 *Application Help* > *Function-Oriented View <Language>* > *People Integration by Key Capability* > *Collaboration* > *Administration Guide* > *Making Rooms Available in the Portal* > *Preparing Rooms for Use* > *Configuring the Search for Room Content* • **SAP NetWeaver 7.0 including EHP3**: http://help.sap.com/nw703 *Application Help* > *Function-Oriented View <Language>* > *People Integration by Key Capability* > *Collaboration* > *Administration Guide* > *Making Rooms Available in the Portal* > *Preparing Rooms for Use* > *Configuring the Search for Room Content*

Task	Detailed Information
On the target system, configure the connection to the required groupware server.	For more information, see the *SAP Library* for your release at: • **SAP NetWeaver 7.0**: http://help.sap.com/nw70 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *People Integration by Key Capability* ▶ *Collaboration* ▶ *Administration Guide* ▶ *Groupware* ▶ *Installing and Configuring E-Mail Connectivity* • **SAP NetWeaver 7.0 including EHP1**: http://help.sap.com/nw701 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *People Integration by Key Capability* ▶ *Collaboration* ▶ *Administration Guide* ▶ *Groupware* ▶ *Installing and Configuring E-Mail Connectivity* • **SAP NetWeaver 7.0 including EHP2**: http://help.sap.com/nw702 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *People Integration by Key Capability* ▶ *Collaboration* ▶ *Administration Guide* ▶ *Groupware* ▶ *Installing and Configuring E-Mail Connectivity* • **SAP NetWeaver 7.0 including EHP3**: http://help.sap.com/nw703 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *People Integration by Key Capability* ▶ *Collaboration* ▶ *Administration Guide* ▶ *Groupware* ▶ *Installing and Configuring E-Mail Connectivity*

Task	Detailed Information
If the e-mailing service is active on the source system, but is not required on the target system, you need to delete the e-mail transport. After deletion of the transport, e-mailing is disabled. E-mails will no longer be automatically sent, for example, when members are excluded from a room or documents are updated and deleted.	For more information, see the *SAP Library* for your release at: • **SAP NetWeaver 7.0**: http://help.sap.com/nw70 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *People Integration by Key Capability* ▶ *Collaboration* ▶ *Administration Guide* ▶ *Groupware* ▶ *Installing and Configuring E-Mail Connectivity* ▶ *Configuration Steps* ▶ *Creating an E-Mail Transport* • **SAP NetWeaver 7.0 including EHP1**: http://help.sap.com/nw701 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *People Integration by Key Capability* ▶ *Collaboration* ▶ *Administration Guide* ▶ *Groupware* ▶ *Installing and Configuring E-Mail Connectivity* ▶ *Configuration Steps* ▶ *Creating an E-Mail Transport* • **SAP NetWeaver 7.0 including EHP2**: http://help.sap.com/nw702 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *People Integration by Key Capability* ▶ *Collaboration* ▶ *Administration Guide* ▶ *Groupware* ▶ *Installing and Configuring E-Mail Connectivity* ▶ *Configuration Steps* ▶ *Creating an E-Mail Transport* • **SAP NetWeaver 7.0 including EHP3**: http://help.sap.com/nw703 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *People Integration by Key Capability* ▶ *Collaboration* ▶ *Administration Guide* ▶ *Groupware* ▶ *Installing and Configuring E-Mail Connectivity* ▶ *Configuration Steps* ▶ *Creating an E-Mail Transport*

Task	Detailed Information
On the target system, reconfigure the `ServerName` and `ServerPort` for the application sharing server.	For more information, see the *SAP Library* for your release at: • **SAP NetWeaver 7.0**: http://help.sap.com/nw70 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *People Integration by Key Capability* ▶ *Collaboration* ▶ *Administration Guide* ▶ *Real-Time Collaboration* ▶ *Configuring Real-Time Collaboration* ▶ *Configuring the Application Sharing Server (RTC)* ▶ *Setting Application Sharing Server Parameters (RTC)* • **SAP NetWeaver 7.0 including EHP1**: http://help.sap.com/nw701 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *People Integration by Key Capability* ▶ *Collaboration* ▶ *Administration Guide* ▶ *Real-Time Collaboration* ▶ *Configuring Real-Time Collaboration* ▶ *Configuring the Application Sharing Server (RTC)* ▶ *Setting Application Sharing Server Parameters (RTC)* • **SAP NetWeaver 7.0 including EHP2**: http://help.sap.com/nw702 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *People Integration by Key Capability* ▶ *Collaboration* ▶ *Administration Guide* ▶ *Real-Time Collaboration* ▶ *Configuring Real-Time Collaboration* ▶ *Configuring the Application Sharing Server (RTC)* ▶ *Setting Application Sharing Server Parameters (RTC)* • **SAP NetWeaver 7.0 including EHP3**: http://help.sap.com/nw703 ▶ *Application Help* ▶ *Function-Oriented View <Language>* ▶ *People Integration by Key Capability* ▶ *Collaboration* ▶ *Administration Guide* ▶ *Real-Time Collaboration* ▶ *Configuring Real-Time Collaboration* ▶ *Configuring the Application Sharing Server (RTC)* ▶ *Setting Application Sharing Server Parameters (RTC)*

7.5.3 Business Intelligence Java Components (BI Java)

You have to perform the following follow-up activities for usage type BI Java.

Related Information

Business Intelligence (BI Java) [page 113]
Basic Configuration for Usage Type BI Java [page 114]

7.5.3.1 Business Intelligence (BI Java)

Use

Follow the instructions in this section if the entries for source system connection have not been copied to the services file of your target system.

Prerequisites

You have performed a system copy that includes SAP NetWeaver Business Warehouse (SAP NetWeaver BW).

Procedure

Adding Entries to the Services File

You have to do the following to add the entries to the services file:

If your target host runs on a UNIX platform

1. Log on to your target system as user `root`.

   > ⚠ Caution
   >
   > Make sure that the user `root` has not set any environment variables for a different SAP system or database.

2. Edit the file `/etc/services`.
3. Add the entries for your source system connection, for example **`sapgw47 3347`**.

If your target host runs on a Windows platform or on IBM i

1. Log on to your target system as a member of the local administration group.

2. Edit the file `<WindowsDirectory>\system32\drivers\etc\services`.
3. Add the entries for your *source system connection*, for example **`sapgw47 3347`**.

7.5.3.2 Basic Configuration for Usage Type BI Java

As of SAP NetWeaver 7.0 Support Package 8, you can run the wizard-based configuration task *BI-Java / Technical configuration of BI-Java (repeatable, reproducible)* using the configuration wizard to automatically configure the required settings for portal and BI Java integration.

For more information, see the *SAP Library* for your release at:

SAP NetWeaver Release	Location
SAP NetWeaver 7.0	http://help.sap.com/nw70 ▶ *Application Help* ▶ *SAP Library: <Language>* ▶ *SAP NetWeaver* ▶ *Technology Consultant's Guide* ▶ *Enterprise Reporting, Query, and Analysis* ▶ *Wizard-Based Configuration of BI Java*.
SAP NetWeaver 7.0 including EHP1	http://help.sap.com/nw701 ▶ *Application Help* ▶ *SAP Library: <Language>* ▶ *SAP NetWeaver* ▶ *Technology Consultant's Guide* ▶ *Enterprise Reporting, Query, and Analysis* ▶ *Wizard-Based Configuration of BI Java*.
SAP NetWeaver 7.0 including EHP2	http://help.sap.com/nw702 ▶ *Application Help* ▶ *SAP Library: <Language>* ▶ *SAP NetWeaver* ▶ *Technology Consultant's Guide* ▶ *Enterprise Reporting, Query, and Analysis* ▶ *Wizard-Based Configuration of BI Java*.
SAP NetWeaver 7.0 including EHP3	http://help.sap.com/nw703 ▶ *Application Help* ▶ *SAP Library: <Language>* ▶ *SAP NetWeaver* ▶ *Technology Consultant's Guide* ▶ *Enterprise Reporting, Query, and Analysis* ▶ *Wizard-Based Configuration of BI Java*.

7.5.4 Development Infrastructure (DI)

You have to perform the following manual steps on the target system after moving an SAP system with usage type Development Infrastructure (DI). The assumption here is that all components (DTR, CBS, CMS, SLD, and name server) were on a single host before the move and will remain on a single host after the move.

Procedure

1. If you are using an LDAP server for user management, it should be running to ensure that all the users that were created when the Development Infrastructure (DI) was on the source system will still be valid after the move to the target system.
2. Check the Java Engine configuration:
   - Set `MaxHeapSize` and other engine parameters to the recommended values.
     For more information, see your installation guide.
   - If your database is SAP MaxDB, perform the following steps:
     1. Upgrade your SAP MaxDB database to at least version 29.
     2. Set the `JOIN_OPERATOR_IMPLEMENTATION` parameter to **`IMPROVED`** (setting this value is only possible using the DB-WebUI in SAPMMC).
     3. Restart the database.
   - For general recommendations for the configuration of the Development Infrastructure Servers, see **SAP Note**889038.
3. Design Time Repository (DTR):
   - Redeploy the database schema.
     This is necessary to re-create the missing metadata for the database views in the dictionary. Otherwise OpenSQL cannot see the database views.
     The database schema of the DTR server is part of the NWDI SCA. This is the SCA that you have downloaded from SAP Software Distribution Center to deploy the SAP NetWeaver Development Infrastructure (NWDI).
     To only deploy this database schema, you have to extract the SCA file. You can do this by appending **`.zip`** to the filename. Then you can use a normal archive tool like WinZip. Under the subfolder `DEPLOYARCHIVES`, you can find the SDA `sap.com~tc~dtr~dbschema.sda` for the database schema. This SDA must be deployed using the Software Deployment Manager (SDM).

     > **Note**
     >
     > During deployment, use the option *Update deployed SDAs/SCAs that have any version*. This option can be set in the *Deployment* tab on SDM.

   - Restart DTR server.
   - Change the URL of the name server (in name server configuration page in Web UI: `http://<dtrhost>:<port>/dtr/system-tools/administration/NameServerConfiguration`) if you intend to use a different name server for the moved DTR instance, or if the name server was also moved.
   - Perform *Update Statistics* (30%) on the database.

> **Note**
>
> If your database is SAP MaxDB, you can use the database manager to update the database statistics.

4. System Landscape Directory (SLD):

   If you used the SLD on the source host as the name server, you need to change the CimomURL to point to the target host. To do so, proceed as follows:

   a. Log on to the SLD as administrator.

   b. Choose *Administrator* > *Content Maintenance*, then under *Class*, choose *System Landscape Directory* > *<your local SLD>*.

   c. Under *CimomURL*, change the host to target host.

> **Caution**
>
> Do not change the `ObjectServer` attribute.

5. Component Build Service (CBS):

   The service properties `JDK_HOME_PATHS`, `BUILD_TOOL_JDK_HOME`, `rootFolder`, and `threadPoolSize` have to be adjusted according to the hardware and software configuration of the new system.

   For more information about these parameters, see your installation guide.

6. Change Management Service (CMS):

   The main steps in CMS involve resetting the fields containing URLs to other components (such as DTR, CBS, SLD).

   - **If CMS has not been configured yet**, proceed as follows:
     1. Copy the folder `/usr/sap/trans/EPS/in/CMS<host><SAPSID>`, including its content, to the target host.
     2. Rename the folder to the new host value and new SAP system ID (if changed).
     3. Make sure that the engine user (`<SAPSID>adm`) has write permissions in the copied folder.
   - **If CMS has been configured and you have used it already**, proceed as follows:
     1. For the domain (in the *Domain Data* tab):
        1. Change the SLD URL to point to the target host.
        2. Change the CMS URL to point to the target host.
        3. Change the transport directory to the appropriate directory on the new CMS (target host).
        4. Save the domain. You should see a status message that the data was saved successfully.
        5. Update CMS by choosing *Update CMS*. You should see a status message that the CMS update was successful.
     2. Copy the contents of the transport directory of the old CMS (source system) to the transport directory of the new CMS (target system). The transport directory is configured in the domain (see *Domain Data* tab page).
     3. For each track (in the *Track Data* tab page):
        1. Change the CBS and DTR URLs.
        2. For each runtime system that is defined, change the runtime system configuration to point to the appropriate host (of the target runtime system).
           If this has not changed, leave the fields unchanged.

3. Save the track definition.
   You should see a status message that the data was saved successfully.
4. Restore system state (of the DEV system). This places the software components (SCs) into the import queue of this system.
5. Import these SCs. After the successful import, you should see a status for each SC.

7. IDE:
   - Change the SLD URL in the preference page of the SAP NetWeaver Development Studio (under *Java Development Infrastructure* > *Development Configuration Pool*).
     This should now point to the new SLD on the target system.
   - Import the development configuration that you used earlier for development.

   Now you are ready to begin the development with you new (relocated) Development Infrastructure (DI).
8. Verification Steps (optional)

   The following steps are optional and verify that the Development Infrastructure (DI) is fully functional after the move:

   1. Log on to the DTR (using the browser) for all defined users and browse the repository.
   2. Using IDE, create a new *development component* (DC), check it in and activate it:
      - The activation should be successful.
      - The name of the development component (DC) must be reserved on the name server.
   3. Release the activity created above (from the transport view in the IDE):
      The activity (*change request*) should appear in the import queue of the CONS system of the track.
   4. Import the *change request* into the CONS system (from the CMS Transport Studio).
   5. Assemble a new version of your software components (SCs) in one of the tracks.

7.5.5 Self Services (XSS)

Related Information

Re-Creating the JCo Destinations [page 118]

7.5.5.1 Re-Creating the JCo Destinations

You must re-create the JCo destinations as described in the *SAP Library* for your release at:

SAP NetWeaver Release	Location
SAP NetWeaver 7.0	http://help.sap.com/nw70 ▶ *Development Information* ▶ *Developers's Guides: English* ▶ *Fundamentals* ▶ *Using Java* ▶ *Core Development Tasks* ▶ *Developing User Interfaces* ▶ *Web Dynpro for Java* ▶ *Ensuring Quality* ▶ *Web Dynpro Content Administrator* ▶ *Creating JCo Destinations*.
SAP NetWeaver 7.0 including EHP1	http://help.sap.com/nw701 ▶ *Development Information* ▶ *Developers's Guides: English* ▶ *Fundamentals* ▶ *Using Java* ▶ *Core Development Tasks* ▶ *Developing User Interfaces* ▶ *Web Dynpro for Java* ▶ *Ensuring Quality* ▶ *Web Dynpro Content Administrator* ▶ *Creating JCo Destinations*.
SAP NetWeaver 7.0 including EHP2	http://help.sap.com/nw702 ▶ *Development Information* ▶ *Developers's Guides: English* ▶ *Fundamentals* ▶ *Using Java* ▶ *Core Development Tasks* ▶ *Developing User Interfaces* ▶ *Web Dynpro for Java* ▶ *Ensuring Quality* ▶ *Web Dynpro Content Administrator* ▶ *Creating JCo Destinations*.
SAP NetWeaver 7.0 including EHP3	http://help.sap.com/nw703 ▶ *Development Information* ▶ *Developers's Guides: English* ▶ *Fundamentals* ▶ *Using Java* ▶ *Core Development Tasks* ▶ *Developing User Interfaces* ▶ *Web Dynpro for Java* ▶ *Ensuring Quality* ▶ *Web Dynpro Content Administrator* ▶ *Creating JCo Destinations*.

For more information, see **SAP Note** 899144.

7.5.6 CRM Java Components (JCRM) / Extended E-Selling Components (XECO)

7.5.7 MapBox

You need to proceed as follows to restore the configuration of the CRM Java component MapBox on the target system.

Procedure

1. Shut down the Java engine.
2. Copy the following files to the relevant directories:
   a. Copy the files `mapboxmeta.xml`, `mapboxmeta.xsl`, and `xmlprofiles.xml` to the directory `<J2EE_root>/cluster/server/.mapboxmeta`. You can find these files at the same location on the source system.
   b. Copy the file `coordserver.cfg` to the `<J2EE_root>/cluster/server` directory.
   c. If you want to have the smoketest directory on the target system, then you need to copy the smoketest directory too.
3. Start the Java engine and MapBox from the URL.

Results

You have restored the configuration for MapBox on the target system.

7.5.8 SRM Live Auction Cockpit (SRMLAC)

7.5.9 SCM Forecasting & Replenishment Processor (SCM FRP)

After the system copy, you must perform follow-up activities as described in SAP Note 1033225.

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

Use

> **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 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

- 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*.

> **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 147].

8 Additional Information

Related Information

8.1 Jload Procedures Using the Java Migration Monitor

Related Information

8.1.1 About the Java Migration Monitor

> **Note**
>
> The Java Migration Monitor tool is available only for systems based on **SAP NetWeaver 7.0 EHP2 and higher**,

The Java Migration Monitor is a tool that helps you to perform and control the unload and load process during the system copy procedure.

The Java Migration Monitor performs the following steps:

- Starting the `Jload` processes to load or unload the data according to the requirements of the user
- Informing the person performing the system copy in case of errors

> **Note**
>
> Some features described in this documentation might be not available in the JMigmon tool if you do not use the most current version of the tool

Tool

The tool is part of the `CORETOOL*.SCA` archive and consists of the following:

- User Guide
  - `JMigrationMonitor.pdf`
  - Located:
    `<Drive>:\usr\sap\<SAPSID>\SYS\global\sltools`
- Scripts
  - `jmigmon_export.sh` / `jmigmon_export.bat`
  - `jmigmon_import.sh` / `jmigmon_import.bat`
  - Located:
    `<Drive>:\usr\sap\<SAPSID>\SYS\global\sltools`
- jar archive
  - `jmigmon.jar`
  - Located:
    `<Drive>:\usr\sap\<SAPSID>\SYS\global\sltools\sharedlib`
- Property files
  - `export.jmigmon.properties`
  - `import.jmigmon.properties`
  - Located:
    `<Drive>:\usr\sap\<SAPSID>\SYS\global\sltools`

Prerequisites

- The `JRE` version must be at least 1.4.1.
- `JAVA_HOME` environment variable must point to the JRE directory.
- The correct directory structure for `Jload` dump files must exist on both the source and target hosts

8.1.2 Configuration for Using the Java Migration Monitor

> **Note**
>
> The Java Migration Monitor tool is available only for systems based on **SAP NetWeaver 7.0 EHP2 and higher**,

The following options can be provided via the property file or via command line. Command line parameters take precedence over parameters specified in the property file.

Help

The tool displays the available parameters, if you call it with one of the following command line options:

- `-help`
- `-?`

Version Information

With the following command line option, the tool displays version information: `-version`.

General Options

Name	Description	Comment
`mode`	Java Migration Monitor mode: import or export	Only available as command line option
`sid`	SAP system ID	SAP system ID
`dsn`	Data source name	Specifies the data source name and is registered in the SecureStore; usually `jdbc/pool/<SAPSID>`
`ssProps`	Path to the SecureStore properties file	On Windows: local drive or UNC path
`ssKey`	Path to the SecureStore key file	On Windows: local drive or UNC path
`exportDirs`	Export directories path	Specifies the path or paths for exported data and triggers the export functionality. Separator on Windows: “;” Separator on UNIX, IBM i: “:”
`importDirs`	Import directories path	Specifies the path or paths for imported data and triggers the import functionality. Separator on Windows: “;” Separator on UNIX, IBM i: “:”

Name	Description	Comment
`orderBy`	Package order	This can be the name or path of the file that contains package names. If the option value is omitted the package order is not determined.
`jobNum`	Number of parallel export jobs	Default is 3.
`monitorTimeout`	Monitor time-out in seconds	Default is 30 seconds.
`disableStatistics`	Disables statistics logging	Disables statistics logging for each Jload process: Therefore Jload does not collect statistics data that could later be displayed by the time analyzer.

Additional Options (all optional)

Name	Description	Comment
`orderBy`	Package order	This can be the name or path of the file that contains package names. If the option value is omitted the package order is not determined.
`jobNum`	Number of parallel export jobs	Default is 3.
`monitorTimeout`	Monitor time-out in seconds	Default is 30 seconds.

8.1.3 Starting the Java Migration Monitor

Use

> **Note**
>
> The Java Migration Monitor tool is available only for systems based on **SAP NetWeaver 7.0 EHP2 and higher**,

You can start the tool using one of the following:

- The Windows batch files `jexport_monitor.bat` / `jimport_monitor.bat`
- As part of the `export / import procedure` of the software provisioning manager

The application allows you to specify options in the command line or in the export or import property files. The names of the property files are `export.jmigmon.properties` and `import.jmigmon.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>**

Prerequisites

> **Note**
>
> We recommend that you create a certain directory and start the tool from there, because the `Java Migration Monitor` produces log and trace files in the current working directory.

Before you run the Java Migration Monitor, set the following environment variables:

- `SLTOOLS_HOME`
  Set this variable to the following directory:
  Windows: `<Drive>:\usr\sap\<SAPSID>\SYS\global\sltools\sharedlib` or `<Drive>:\<sapmnt>\<SAPSID>\SYS\global\sltools\sharedlib`
- `SLTOOLS_SECURITY_HOME`
  Set this variable to the directory, which contains the `iaik_jce.jar` file.
  The default directory is:
  Windows: `<Drive>:\usr\sap\<SAPSID>\SYS\global\security\lib\tools` or `<Drive>:\sapmnt\<SAPSID>\SYS\global\security\lib\tools`
- `SLTOOLS_DBDRIVER_HOME`
  Set this variable to the directory, which contains the database driver.

  > **Example**
  >
  > For MaxDB on Windows: `<Drive>:\sapdb\programs\runtime\jar`

Procedure

Start the Java Migration Monitor as user `<sapsid>adm` by executing one of the following from the command line:

- **jmigmon_export.bat -<optionName> <optionValue>**
- **jmigmon_import.bat -<optionName> <optionValue>**

> **Example**
>
> **jmigmon_export.bat -sid CE3 -dsn jdbc/pool/CE3 -ssProps D:\usr\sap\CE3\SYS\global\security\data\SecStore.properties -ssKey D:\usr\sap\CE3\SYS\global\security\data\SecStore.key -exportDirs D:\JPKGCTL**

Start the monitor and then close the shell window or command processor. The monitor process runs in the background. Use the `monitor *.log` and `*.console.log` files to check monitor processing state.

Result

What happens during the export or import:

During the **import** the tool starts a search in the directories specified by the `-importDirs` parameter for packages in XML format and puts them into a working queue.

Next it starts a number (specified by the `-jobNum` parameter) of parallel Jload importing tasks, taking tasks from the working queue until the queue is empty.

During the **export** the tool starts a search in the directories specified by the `-exportDirs` parameter for packages in XML format and puts them in a working queue.

Then it starts exporting all the packages containing metadata one after another (not in parallel) while removing them from the queue. The tool then starts a number (specified by the `-jobNum` parameter) of parallel `Jload` export tasks, taking tasks from the working queue until the queue is empty.

Example

export.jmigmon.properties file with export options

```
# jmigmon mode: import or export mode = export # number of parallel export jobs,
default is 3 jobNum = 1 # <SAPSID> of the system sid = CE3 # name of datasource
registered in system's SecureStore; usually jdbc/pool/<SAPSID> dsn = jdbc/pool/
CE3 # path of the SecureStore properties file ssProps = D:\usr\sap\CE3\SYS\global
\security\data\SecStore.properties # path of the SecureStore key file ssKey = D:
\usr\sap\CE3\SYS\global\security\data\SecStore.key # list of export directories
exportDirs = D:\JPKGCTL # monitor timeout in seconds, default is 30
monitorTimeout = 30
```

import_monitor.properties file with import options

```
# jmigmon mode: import or export mode = export # number of parallel export jobs,
default is 3 jobNum = 1 # <SAPSID> of the system sid = CE3 # name of datasource
registered in system's SecureStore; usually jdbc/pool/<SAPSID> dsn = jdbc/pool/
CE3 # path of the SecureStore properties file ssProps = D:\usr\sap\CE3\SYS\global
\security\data\SecStore.properties # path of the SecureStore key file ssKey = D:
\usr\sap\CE3\SYS\global\security\data\SecStore.key # list of import directories
importDirs = D:\export\unpacked\JAVA\JDMP # monitor timeout in seconds, default
is 30 monitorTimeout = 30
```

8.1.4 Output Files of the Java Migration Monitor

> **Note**
>
> The Java Migration Monitor tool is available only for systems based on **SAP NetWeaver 7.0 EHP2 and higher**,

Export

- `export.state.properties`
- `<PACKAGE>.xml.log`

Import

- `import.state.properties`
- `<PACKAGE>.xml.log`

Both the export and import state files contain package state lines such as the following:

```
SAPUSER=+
```

Format of lines is `<PACKAGE>=<STATE>`. The following table shows the possible values for state:

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.

8.1.5 Restarting Jload Processes

Use

> **Note**
>
> The Java Migration Monitor tool is available only for systems based on **SAP NetWeaver 7.0 EHP2 and higher**,

The state file allows package states to be manually updated to restart failed `Jload` 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 will be started again.

Procedure

- To restart package processing, set the package state from “-” to “0”.
- To skip package processing, set the package state from “0” or “-” to “+”.

> ⚠ Caution
>
> This is not recommended because it can cause inconsistent data files or database content.

- If the package is currently being processed (the package state is “?”) then any manual modifications of the package state are ignored.

8.2 Analysis of the Export and Import Times

You can reduce the runtimes by splitting the packages in question or extracting long-running tables from the packages.

If your SAP system is based on **SAP NetWeaver 7.0 EHP2 and higher**, you can use the `jmigtime.jar` archive to analyze the runtimes of the individual packages. The tool is part of the `CORETOOL*.SCA` archive and consists of the following:

- User Guide
  - `JavaTimeAnalyzer.pdf`
  - Located:
    `<Drive>:\usr\sap\<SAPSID>\SYS\global\sltools`
- Scripts
  - `jexport_time.sh` / `jexport_time.bat`
  - `jimport_time.sh` / `jimport_time.bat`
  - `jtime_join.sh` / `jtime_join.bat`
  - Located:
    `<Drive>:\usr\sap\<SAPSID>\SYS\global\sltools`
- jar archive
  - `jmigtime.jar`
  - Located:
    `<Drive>:\usr\sap\<SAPSID>\SYS\global\sltools\sharedlib`
- Property files
  - `export.jmigtime.properties`
  - `import.jmigtime.properties`
  - Located:
    `<Drive>:\usr\sap\<SAPSID>\SYS\global\sltools`

8.3 Package and Table Splitting for Java Tables

Purpose

The Java Splitter offers the following possibilities:

- Splitting the default packages `EXPORT.XML` and `IMPORT.XML` into several smaller and equal sized packages:
- Extracting large tables into packages of their own
- Splitting large tables into several smaller and equal sized packages (table splitting)

The tool provides the corresponding split packages for export and import. Package splitting and table splitting can be used combined or separately.

Tool

The tool archive consists of the following:

- User Guide
  - *JSplitterUserGuide.pdf*
  - Located:
    `<Drive:>:\usr\sap\<SAPSID>\SYS\global\sltools`
- Scripts for starting the tool standalone
  - `jsplitter.sh`, `jsplitter.bat`
  - Located:
    `<Drive:>:\usr\sap\<SAPSID>\SYS\global\sltools`
- jar archive
  - `sdt_jcopy_jpkgctl.jar`
  - Located:
    `<Drive:>:\usr\sap\<SAPSID>\SYS\global\sltools\sharedlib`

8.3.1 Configuration for Using the Java Splitter

The following options can be provided via the property file or via command line. Command line parameters take precedence over parameters specified in the property file.

> **Note**
>
> To get the complete list of supported options run **`java com.sap.inst.<tool> -help`**

Help

With the following command line option, the tool displays all parameters available:

`-help`

General Options

General Splitting Options

Option	Description	Comment
`-sec`	List of SAP system ID and data source name[,SecureStore property file, SecureStore key file][,SecureStore key phrase]	**Note** This option is mandatory. Separator on Windows: "," Separator on UNIX, IBM i: ","
`-dataDir`	Output data directory	**Note** This option is mandatory. If this option is missing, the split rules are taken from the command line arguments.
`-log`	Log file with program output messages and errors	Default log file name is `JPkgClt.console.log`. In addition, a trace file (`JPkgCtl.trc`) with detailed process descriptions, errors, and messages is generated.
`-help`	Prints help options for the parameters and their usage	non

Mandatory General Options

The following splitting options are mandatory for both package and table splitting:

`sid`, `dsn`, `ssProps`, `ssKey`, `dataDir`

Package Splitting Options

Package Splitting Options

Option	Description	Comment
`-split`	Size of the splitted package with tables	Size can be a number of bytes (for example, 1048576, 200M, 8G, and so on)

Additional Mandatory Option for Package Splitting

Splitting option: `split`

Table Splitting Options

Table Splitting Options

Option	Description	Comment
`-splitrulesfile`	Files that contains key fields for each table	Syntax: <TABLE_NAME>:<NUMBER_OF_PACKAGES_FOR_SPLITTING>:<[TABLE_KEY_FOR_SPLITTING]>
`-tablesplit`	Rules for splitting each table	Syntax: <TABLE_NAME>:<NUMBER_OF_PACKAGES_FOR_SPLITTING>:<[TABLE_KEY_FOR_SPLITTING]>

`-checksplitrules`	Checks the syntax of the `splitrulesfile`. It expects a file as an argument.	Syntax:
		<TABLE_NAME>:<NUMBER_OF_PACKAGES_FOR_SPLITTING>:<[TABLE_KEY_FOR_SPLITTING]>
		Example
		`J2EE_CONFIG:2:`
		`J2EE_CONFIGENTRY:4:CID`
		`BC_COMPVERS:`
		`2:COMPID;HASHNUMBER;COMPONENTTYPE;SUBSYSTEM`

Caution

When configuring table splitting for a table without primary key (such as `J2EE_CONFIGENTRY`), you have to provide a value for parameter `<COLUMN_TO_BE_USED_FOR_SPLITTING>`. If the table to be split has a primary key (PK), this parameter is optional.

Additional Mandatory Options for Table Splitting

Splitting options: `splitrulefile`, `tablesplit`

Example

JSplitter_cmd.properties :

```
#
# Table Splitting options
#
# Common options
#
# List of SAPSID, data source name[,SecureStore property file, SecureStore key
file][,SecureStore key phrase]
-sec=CE1, jdbc/pool/CE1,D:\usr\sap\CE1\SYS\global\security\data
\SecStore.properties, D:\usr\sap\CE1\SYS\global\security\data\SecStore.key
# Size of the split package with tables
-split=200M
# Output data directory
-dataDir=C:\jsplitter_export_dir
# File that contains key fields for each table with the following syntax:
<TABLE_NAME>:<NUMBER_OF_PACKAGES_FOR_SPLITTING>:<[TABLE_KEY_FOR_SPLITTING]>
-splitrulesfile=C:\jsplitter_export_dir\splitrulesfile.txt
# Log file with program output messages and errors
-log=
# Check splitrulesfile syntax
-checksplitrules=C:\jsplitter_export_dir\splitrulesfile.txt
```

8.3.2 Starting the Java Splitter

This section describes how to start the Java splitter.

Prerequisites

Before you run the table splitter, set the following environment variables:

- `SLTOOLS_HOME`
  Set this variable to the following directory:
  `<Drive>:\usr\sap\<SAPSID>\SYS\global\sltools\sharedlib` or `<Drive>:\sapmnt\<SAPSID>\SYS\global\sltools\sharedlib`
- `SLTOOLS_SECURITY_HOME`
  Set this variable to the directory, which contains the `iaik_jce.jar` file.
  The default directory is:
  `<Drive>:\usr\sap\<SAPSID>\SYS\global\security\lib\tools` or `<Drive>:\sapmnt\<SAPSID>\SYS\global\security\lib\tools`
- `SLTOOLS_DBDRIVER_HOME`
  Set this variable to the directory, which contains the database driver.

  Example

  For MaxDB on Windows: `<Drive>:\sapdb\programs\runtime\jar`

Context

Recommendation

We recommend to create a certain directory for splitting and start the tools from there, because the splitter produces log and trace files in the current working directory.

The application allows you to specify options in the command line or in the application property file. The name of the property file is `JSplitter_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.

Note

To check the splitting processing state, use the `splitter *.trc` and `*.console.log` files.

Procedure

1. Start the table splitter as user `<sapsid>adm` using the following batch file:
   `jsplitter.bat`
2. Specify options as required in one of the following ways-`optionName optionValue`.
   - Command line:
     Specify the option in the format **`-optionName optionValue`**
   - Property file:
     Add an option as a new line in the format **`optionName=optionValue`**

> **Note**
>
> If you use an invalid option or you enter `-help`, the available options for starting the tool are displayed.

Example

Command line

```
jsplitter.bat -tablesplit BC_COMPVERS:2 -tablesplit J2EE_CONFIG:4:CID;PATHHASH -
tablesplit J2EE_CONFIGENTRY:4:CID
```

8.3.3 Output Files of the Java Splitter

Here you find an overview of the log, trace, result, and metadata files of the Java splitter.

- `JPkgCtl.console.log`
  Default log file of splitter tool
- `JPkgCtl.trc`
  Trace file with additional and more detailed information
- `IMPORT_<PKG_NUMBER>.XML`
  Resulting xml files for import after package splitting
- `EXPORT_<PKG_NUMBER>.XML`
  Resulting xml files for export after package splitting
- `IMPORT_PKG_METADATA.XML`
  Metadata for tables
- `EXPORT_PKG_METADATA.XML`
  Metadata for tables
- `sizes.xml`
  File with list of the biggest tables with their expected package size in bytes

8.4 Implementing Oracle Database Vault with the Installer

The installer supports Oracle Database Vault. This section provides information about implementing Oracle Database Vault (DV) with the installer.

Prerequisites

- Your Oracle database version must be 12.1 or higher.
- Check the prerequisites, restrictions, and patch requirements as listed in SAP Note 2218115.

Context

For Database Independent System Copy [page 33], the installer prompts whether DV is to be installed.

For the Oracle-Specific Procedure [page 55] the DV is already installed in the source database and must be first disabled to complete the scenario and can then be enabled before the scenario is completed.

DV requires the following addional users:

- `secadmin`
- `secacctmgr`

These users are created by the installer.

For more information about Oracle Database Vault, see the Oracle Database documentation referred to in SAP Note 2218115.

Procedure

1. Start the installer and choose the export option for your system variant as described in Running the Installer [page 38].
2. During the target system installation, on the *Oracle Database* screen where you are prompted to enter the required Oracle database parameters, mark the *Install Oracle Database Vault* checkbox.
3. During the target system installation, on the *Database Accounts for Oracle Database Vault* screen, specify the following:
   - Provide the passwords for the Oracle Database Vault user accounts `secadmin` and `secacctmgr` which are to be created by the installer.
   - If you want to be enabled after the installation has completed, mark the *Enable Oracle Database Vault* checkbox.

Next Steps

Configure Oracle Database Vault as described in SAP Note 2218115.

8.5 IBM Db2 for Linux, UNIX, and Windows Database

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

Use

> ⚠ Caution
>
> This section applies **only** 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 enables you 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 Db2's own log file management solution. For more information, see the documentation *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, 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)
   - `USEREXIT`
     For downward compatibility with the former user exit concept, you can specify value `USEREXIT` for parameter `LOGARCHMETH1`.
   - `VENDOR:<path_to_vendor_lib>`
     Log files are archived to a library that is provided by your vendor storage management.

   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 documentation *Database Administration Guide for SAP on IBM Db2 for Linux, UNIX, and Windows*.
3. To activate the settings, restart the database. The database is now in backup pending mode. You need to take an offline backup before you can continue.
4. If you plan to make a backup to tape on Windows, you have to initialize the tape drive by entering the following command:
   ```
   db2 initialize tape on \\.\<tape_device>
   ```
5. 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 `TAPE0` and `TAPE1`, enter the following command:

   ```
   db2 backup database C11 to \\.\TAPE0, \\.\TAPE1
   ```

Note

On a multipartitioned 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

- *Database Administration Guide for SAP on IBM Db2 for Linux, UNIX, and Windows* (see Online Information from SAP [page 147])
- For direct access to online information about Db2 that is provided by IBM, see Online Information from IBM [page 138].

- For access to more documentation for SAP systems on IBM Db2 for Linux, UNIX, and Windows, see Online Information from SAP [page 147].

8.5.2 Online Information from IBM

You can use the following IBM Knowledge Center welcome page as a starting point to all kinds of documentation for yourIBM Db2 for Linux, UNIX, and Windows version: http://www.ibm.com/support/knowledgecenter/en/SSEPGG

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

IBM Db2 Knowledge Center

Database Version	Internet Address
IBM Db2 11.1	http://www.ibm.com/support/knowledgecenter/SSEPGG_11.1.0/com.ibm.db2.luw.kc.doc/welcome.html
IBM Db2 10.5	https://www.ibm.com/support/knowledgecenter/SSEPGG_10.5.0/com.ibm.db2.luw.kc.doc/welcome.html
IBM Db2 10.1	https://www.ibm.com/support/knowledgecenter/SSEPGG_10.1.0/com.ibm.db2.luw.kc.doc/welcome.html
IBM Db2 9.7	https://www.ibm.com/support/knowledgecenter/SSEPGG_9.7.0/com.ibm.db2.luw.kc.doc/welcome.html

IBM Manuals

Database Version	Internet Address
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
IBM Db2 9.7	http://www.ibm.com/support/docview.wss?rs=71&uid=swg27015148

8.6 Oracle Database

Additional Information about the OraBRCopy Tool [page 139]

8.6.1 Additional Information about the “OraBRCopy” Tool

Related Information

Configuration [page 139]
Output Files [page 141]

8.6.1.1 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
`oracleHome`	Oracle home directory	Determined automatically in script/batch files from the `ORACLE_HOME` environment variable
`sourceSid`	Source database `SID`	Determined automatically in script/batch files from the `ORACLE_SID` environment variable
`targetSid`	Target database `SID`	

Name	Description	Comment
listenerPort	Listener port number	Mutually exclusive with `tnsAlias`. Can be found in the `listener.ora` file of the source database.
tnsAlias	Oracle `TNS` alias	Mutually exclusive with `listenerPort`. Can be found in the `tnsnames.ora` file of the source database.
password	Password of SYSTEM database user	
generateFiles		Generates control/trace and `init<TARGET_DBSID>.ora` files.
forceLogSwitches		Forces log switches. If this option is specified then Oracle database will be stopped during the tool execution. 3

Additional Options

Name	Description	Comment
bg	Enables background mode	**Note** Takes effect only as command line option. If the tool is running in the background mode, the UNIX shell window or Windows command prompt can be closed after startup.
secure	Enables secure mode	**Note** Takes effect only as command line option. 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.

Name	Description	Comment
trace	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**

8.6.1.2 Output Files

- CONTROL.SQL
- CONTROL.TRC
- init<TARGET_DBSID>.ora
- ora_br_copy.log
- OraBRCopy.console.log

8.7 Verifying and Adjusting the instanceID of an AS Java Instance

Using option *Adjust instanceID of an AS Java Instance* in Software Provisioning Manager (the“ installer” for short), you can verify the correctness of the instanceID and box number parameters of an existing AS Java instance, and adjust them if required.

Prerequisites

- The AS Java instance can be started.
- **Caution:** The installer performs changes in the database which are related to J2EE Engine configuration. Therefore it is recommended that you back up the J2EE Engine configuration using the ConfigTool. You can do this by exporting configurations cluster_data,HttpHosts, apps, jms_provider, and WebContainer using OfflineConfigEditor and configuration of <SAPSID>/Server <xxx>/Services/Key Storage using the Visual Administrator.

Context

When to Use Option *Adjust instanceID of an AS Java Instance*

- Software Update Manager (SUM) fails due to incorrect parameter `instanceID`.

  Example

  An error like the following occurs during the upgrade of a Java system based on SAP NetWeaver 7.0x:

  ```
  The detected instance ID IDXXXXX and the one calculated from the box number
  IDXXXXX do not match. A possible reason for this could be that you have
  changed the box number in the central instance instance.properties file.
  ```

- The installer (70SWPM*.SAR) fails due to incorrect parameter `instanceID`.

  Example

  An error like the following occurs during system copy, dual-stack split, or system rename of a Java system based on SAP NetWeaver 7.0x with Software Provisioning Manager:

  ```
  The source or target cluster ID is not present on the system! The current
  (source) cluster ID is XXXXX and the new (target) cluster ID is XXXXX
  ```

- You are in doubt about consistency or correctness of the `instanceID` parameter of an AS Java instance.

Background Information About How *Adjust instanceID of an AS Java Instance* Works

Software logistics tools (Software Provisioning Manager (the“ installer”), Software Update Manager) verify if the `instanceID` parameter corresponds to the box number of an SAP system based on SAP NetWeaver AS for Java. If the `instanceID` parameter is not consistent, Software Provisioning Manager fails.

The Box number has the format `<SAPSID><instance_name><host_name>` and is used as a parameter for the `instanceID` generation. `instanceID` is a unique identifier generated for each instance and is stored in the SAP system database schema when creating a new Java system.

An inconsistency between `instanceID` and `box number` is caused by applying an unsupported procedure to create or maintain the system. Using Software Provisioning Manager for system copy or system rename (changing the `<SAPSID>`, host name, or instance name) guarantees consistency.

Adjust instanceID of an AS Java Instance changes the `box number` and `instanceID` in the database and synchronizes the `instance.properties` file.

More Information

For more information, such as troubleshooting and FAQ, see SAP Note 2259748.

Procedure

1. Stop the AS Java instance or dual-stack instance and make sure that the database is running.
2. Start the installer and choose option *Adjust instanceID of an AS Java Instance* from the following path in the *Welcome* screen:

Software Life-Cycle Options > *Additional Preparation Options* > *Adjust instanceID of an AS Java Instance*

> **Caution**
>
> If the AS Java instance uses a virtual host name, start the installer with the installer property `SAPINST_USE_HOSTNAME` as follows:
>
> `./sapinst SAPINST_USE_HOSTNAME=<Virtual_Host_Name>`

3. Follow the instructions given on the screens.

Next Steps

Perform the following activities after applying the correction:

1. Calculate the box number using the `SAPLOCALHOST` profile parameter in lower case.
2. Calculate the correct `instanceID` using the tool attached to SAP Note 1987497.
3. Adapt the `/usr/sap/<SAPSID>/<instance_name>/j2ee/cluster/bootstrap/bootstrap.properties` file: Assign the `instance.prefix` property to the correct `instanceID`.
4. Examine the instance profile - if `j2ee/instance_id` exists, change it to the new `instanceID`.
5. Open the `OfflineConfigEditor` and expand `cluster_data`
   If the `perfomerID` property exists, change it to the new `instanceID`.
6. If you have **EP: Knowledge Management and Collaboration** installed on your system, you have to do the following adjustments for the **Scheduler Service**:
   Assign scheduler tasks to the new system IDs of the target system. This is required because after applying the correction, tasks are still assigned to the IDs of the source system.
   For more information, see SAP Help Portal at:

Release	Path
○ **SAP NetWeaver 7.0**: ○ **SAP NetWeaver 7.0 including EHP1**: ○ **SAP NetWeaver 7.0 including EHP2**: ○ **SAP NetWeaver 7.0 including EHP3**:	https://help.sap.com/viewer/p/SAP_NETWEAVER > *SAP NetWeaver 7.0* `<Including Enhancement Package>` > *Application Help* > *SAP NetWeaver by Key Capability* > *Information Integration: Key Areas* > *Knowledge Management* > *Administration Guide* > *Minimal Configuration for Knowledge Management* > *Cluster Only: Assigning Tasks to Nodes*

Related Information

Running the Installer [page 38]

8.8 Using PowerShell

SAP uses Windows PowerShell to run and describe Windows commands.

For Windows Server 2012 (R2) and higher, SAP only uses Windows PowerShell to run and describe Windows commands.

Windows PowerShell is a powerful tool integrated in the Windows operating system. It uses object-oriented methodology, which allows fast and stable script development.

For more information about the Windows PowerShell, see:

http://technet.microsoft.com/en-us/scriptcenter/dd742419.aspx

There you can find links to the online help, online documentation, scripting repository, downloads, and blogs.

If you want to use the PowerShell feature, note the following:

- Windows Server 2016
  Windows Server 2016 contains PowerShell 5.0
  You can update to PowerShell 5.0 (search the internet for *Windows Management Framework 5.0*).
- Windows Server 2012 R2
  Windows Server 2012 R2 contains PowerShell 4.0.
- Windows Server 2012
  Windows Server 2012 contains PowerShell 3.0.
  You can update to PowerShell 4.0 (search the internet for *Windows Management Framework 4.0*).
- Windows Server 2008 R2
  Windows Server 2008 R2 contains PowerShell 2.0.
  For more information about PowerShell 2.0, see http://support.microsoft.com/kb/968929 .
  You can update to PowerShell 3.0 or 4.0 (search the internet for *Windows Management Framework 3.0* or *Windows Management Framework 4.0*).
- Windows Server 2008
  You have to activate the PowerShell feature with *Start* > *Administrative Tools* > *Server Manager* > *Features* .
  On Windows Server 2008, you can update to PowerShell 3.0 (search the internet for *Windows Management Framework 3.0*).

How to Start PowerShell

> **Caution**
>
> Make sure that you start the PowerShell in administrator mode.

- Windows Server 2012 (R2) and higher
  Open the command prompt and enter the command:
  `powershell.exe`

To start PowerShell on Windows Server 2008 (R2), you have the following options:

- From the command prompt, by entering the command:
  `powershell.exe`
- From the *Start* Menu:
  - PowerShell 1.0:
    Choose *Start* > *All Programs* > *Windows PowerShell 1.0* > *Windows PowerShell*.
  - PowerShell 2.0:
    Choose *Start* > *All Programs* > *Windows PowerShell* > *Windows PowerShell*.

How to Work with PowerShell

Most commands that are used in `cmd.exe` are also available in the PowerShell (defined as aliases).

You can use well-known commands, such as `cd`, `type`, `copy`, `move`, `mkdir`, `delete`, `rmdir`. There is also online help available, which you can access by typing the command: **`help`** (or **`help <command>`**).

This is a list of differences between PowerShell and `cmd.exe`:

- Before you can run PowerShells scripts (text files with the file extension `.ps1` that contain PowerShell statements), you might have to change the default security setting to allow the execution of non-signed scripts as follows:
  `set-executionpolicy ("unrestricted")`
- By default, when double-clicking PowerShell scripts (`.PS1` files) in the Windows explorer, this does not execute the script as is the default for `.cmd` files, but opens the script in an editor. If you want to activate automatic script execution after a double-click, you have to change the value `HKEY_CLASSES_ROOT\Microsoft.Powershellscript.1\Shell\Open\Command` from `notepad.exe` to the full path of the PowerShell executable.
- The output of PIPE commands is not just a stream of characters (strings) but a stream of objects. You can easily access the properties and methods for these objects (see the process list DLL example below).
- The current working directory is not part of the directory search path that the PowerShell looks at for scripts and programs. The PowerShell only searches directories listed in the environment variable path. Therefore, you might have to run a local program with `./sapcontrol.exe` or specify its full path.
- You can use the UNIX-like directory delimiters, such as `cd /usr/sap/C11`.
- You can have your current working directory in a UNC path (`cd \\sapglobalhost\sapmnt`).
- The shell distinguishes between environment variables and shell variables:
  - Use of shell variables:
    Definition: **`$x="hello"`**
    Reference: **`write-host $x`**
  - Use of an environment variable:
    Definition: **`$env:x="hello"`**
    Reference: **`write-host $env:x`**
- The PowerShell has an interesting container concept called `ps-drives`. Within `ps-drives` you can navigate in other objects, such as the registry or shell internal lists in the same way as you typically navigate in a file system (`cd, dir, del`, and so on).
  `dir env`: to get a list of environment variables
  `dir variable`: to get the list of shell variables

`dir HKLM`: to get a list of registry keys in HKEY_LOCAL_MACHINE
`get-psdrive` to get a list of available ps-drives

- Windows PowerShell has full access to the .NET runtime. You can directly access missing functions in the PowerShell via .NET.
- With Windows PowerShell, you can create GUI-class user interfaces using Windows forms.

PowerShell Commands

The following table lists some PowerShell commands that are available on Windows Server 2012 (R2) and higher:

Command	Explanation
`stop-service sap*`	Stops all Windows services with service name starting with "SAP"
`get-process`	Lists currently started processes on your system
`get-process | sort starttime | select -last 1`	Lists the last started process on your computer
`get-process | sort starttime | select -last 1 | format-list -proper *`	Lists all properties of the last started process
`get-process | sort starttime | select -last 1 | get-member`	Lists all process class members (properties and methods) of the last started process
`get-process | %{$_.name;"-----------"; $_.modules}`	Lists all processes, and the executables and DLLs the processes loaded
`$processes = (get-process | sort starttime)`	Defines a shell variable `$processes`, which contains an array of process objects
`$processes.length`	The number of processes in the array (is equivalent to the number of processes on your computer)
`$processes[$processes.length-1].kill()`	Invokes the kill method (terminate process) of the last started process
`(dir a.txt).set_attributes("readonly")`	Sets the file `a.txt` to "read-only"

8.9 Online Information from SAP

More information is available online as follows:

Title	Internet Address
Running an SAP System on IBM Db2 <Version> with the Db2 pureScale Feature	IBM Db2 10.5: https://help.sap.com/viewer/db6_purescale_10_5 (PDF version here) IBM Db2 10.1: https://help.sap.com/viewer/db6_purescale_10_1 (PDF version here)
IBM Db2 High Availability Solution: IBM Tivoli System Automation for Multiplatforms	https://help.sap.com/viewer/db6_samp (PDF version here)
Database Administration Guide for SAP on IBM Db2 for Linux, UNIX, and Windows	https://help.sap.com/viewer/db6_admin (PDF version here)
Database Administration Using the DBA Cockpit: IBM DB2 for Linux, UNIX, and Windows	https://help.sap.com/viewer/db6_dbacockpit (English) https://help.sap.com/viewer/db6_dbacockpit_de (German) Also available in PDF format in English and German
SAP Business Warehouse on IBM Db2 for Linux, UNIX, and Windows: Administration Tasks	https://help.sap.com/viewer/db6_bw PDF version here
Enabling SAP Business Warehouse Systems to Use IBM Db2 for Linux, UNIX, and Windows as Near-Line Storage (NLS)	https://help.sap.com/viewer/db6_nls (PDF version here)
Database Administration Guide for SAP on IBM Db2 for z/OS	https://help.sap.com/viewer/db2_administration_guide
Planning Guide for SAP on IBM Db2 for z/OS	https://help.sap.com/viewer/db2_planning_guide
SAP Security Guide for SAP on IBM Db2 for z/OS	http://help.sap.com/viewer/db2_security_guide
SAP on Db2 for z/OS Community	https://www.sap.com/community/topic/db2-for-zos.html

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