SAP HANA Platform Migration
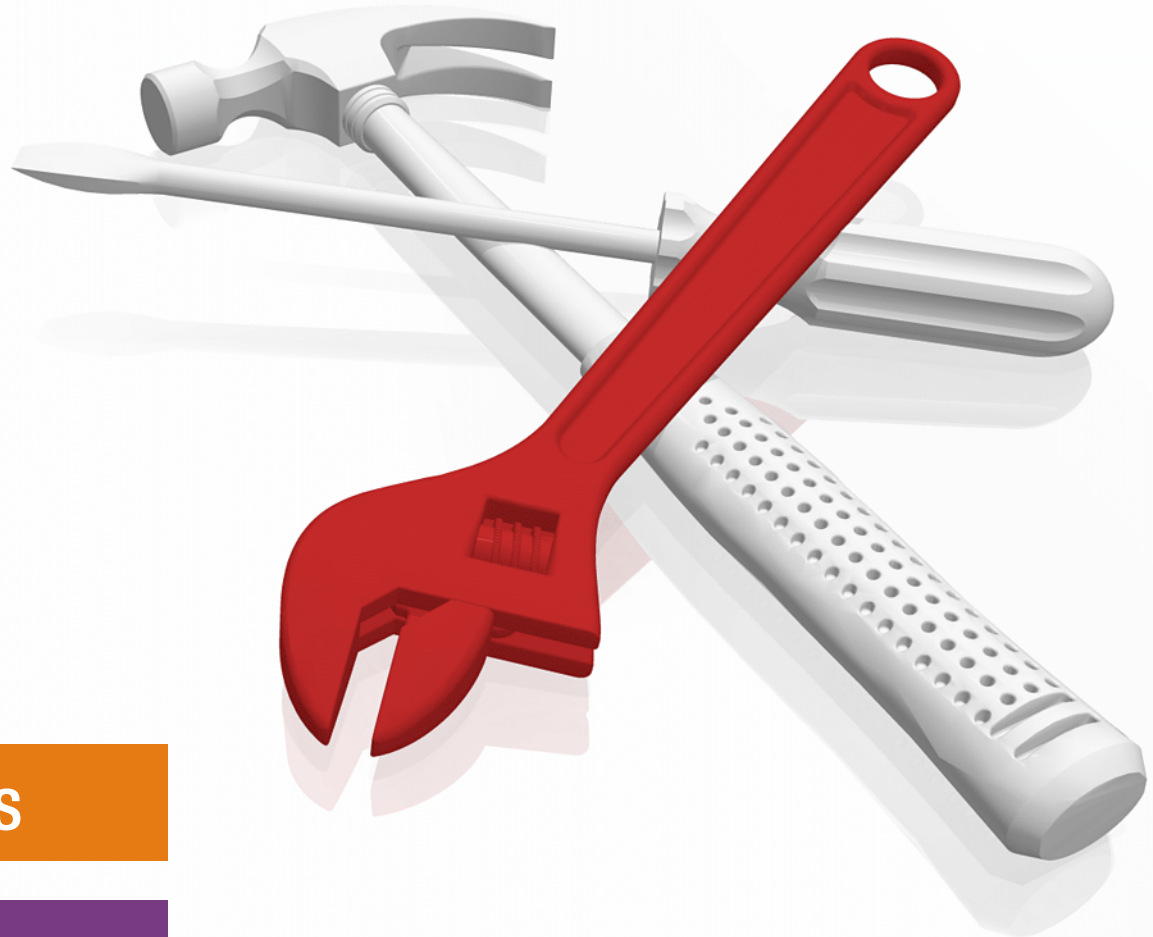
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SAP HANA Platform Migration

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Note: Before using this information and the product it supports, read the information in "Notices" on page v.

First Edition (March 2020)

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SAP HANA Platform 2.0 SPS4
SAP HANA Dynamic Tiering 2.0 SPS4

Contents

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Preface

This IBM® Redpaper publication provides SAP HANA platform migration information and details for successful planning for migration to IBM Power Systems servers.

This publication addresses topics for sellers, IT architects, IT specialists, and anyone who wants to migrate and manage SAP workloads on Power Systems servers. Moreover, this guide provides documentation to transfer how-to skills to the technical teams, and it provides solution guidance to the sales team. This publication complements documentation that is available at IBM Knowledge Center, and it aligns with educational materials that are provided by IBM Systems.

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1

Introducing SAP platform migration

This chapter introduces the SAP concepts for an SAP system database (DB) migration. The terms homogeneous system copy and heterogeneous system copy are also explained.

This chapter provides a list of possible migrations scenarios for SAP HANA DBs on IBM Power Systems, and it describes the different SAP migration tools to accomplish each scenario.

The purpose of this publication is to provide an overview of the SAP tools and methods you can use to migrate your source SAP environment to SAP HANA on IBM Power Systems, including its prerequisites. For more information about the technical step-by-step procedure and preparations, see the SAP official documentation at the SAP HANA Help Portal.

The following topics are described in this chapter:

► Database migration concepts for SAP systems
► Tools and methods that are provided by SAP for database migration to an SAP HANA DB on Power Systems

1.1 Database migration concepts for SAP systems

Migrating an SAP system DB consists of moving or copying it from one server host to a different server host by changing or not changing the DB type and operating system (OS) type.

SAP system DBs can be migrated to:

► Another server host with the same DB and OS types
► Another server host with the same DB type and a different OS type
► Another server host with a different DB type and the same OS type
► Another server host with different DB and OS types

In this matter, SAP has two concepts for SAP systems migration: Homogeneous system copy and heterogeneous system copy.

1.1.1 Homogeneous system copy

Homogeneous system copy consists of moving or copying an SAP system to a new environment with the following considerations:

► The source and target system use the same OS and DB system (DB).
► The hardware architecture remains the same, or is a certified successor where SAP supports homogeneous system copies.

For the operating and DB systems, the following considerations apply:

► SAP-released combinations of OS and DB versions.
► In some cases, an OS or DB upgrade might be necessary on the source system before a system copy can be performed.

Here are the methods for performing an SAP homogeneous system copy:

► DB export and import by using SAP migration tools
► DB backup and recovery by using backup tools that are supported for the DB
► Hardware migration and clones by using supported tools for the hardware
► Virtual machine (VM) copy
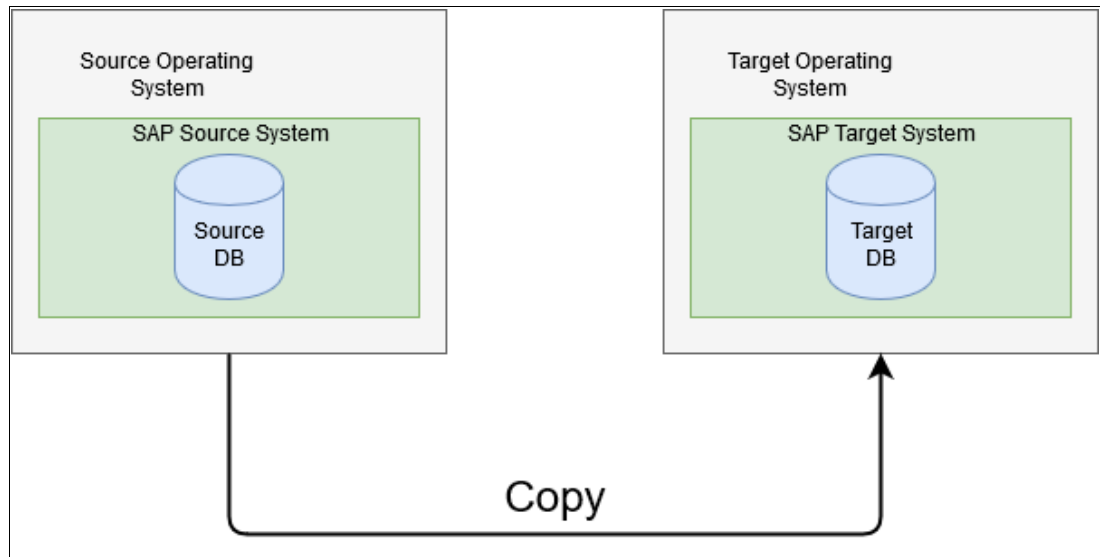
Figure 1-1 illustrates homogeneous system copy.

Figure 1-1   Homogeneous system copy concept

1.1.2 Heterogeneous system copy concept

Heterogeneous system copy consists of moving or copying an SAP system to a new environment with the following considerations:

▶ The source and target system use different OS and DB systems.
▶ A change in the hardware architecture might be involved.

For the operating and DB systems, the following considerations apply:

▶ SAP-released combinations of OS and DB versions.
▶ In some cases, an OS or DB upgrade might be necessary on the source system before a migration can be performed.

In heterogeneous system copy, the source DB is exported to DB and OS platform-independent files, and then the files are transferred to the target server host and imported into the target DB.

The method for performing an SAP heterogeneous system copy is to first export the DB and then import it by using SAP migration tools.
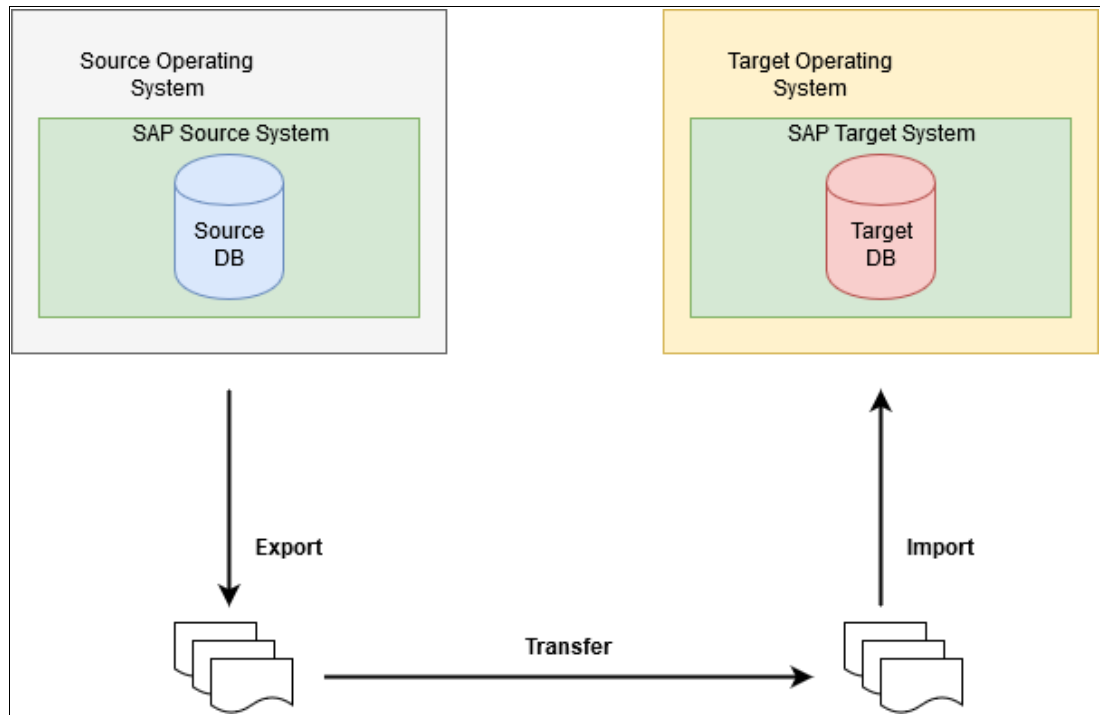
Figure 1-2 illustrates heterogeneous system copy.

Figure 1-2   Heterogeneous system copy concept

1.2 Tools and methods that are provided by SAP for database migration to an SAP HANA DB on Power Systems

To migrate SAP applications (for example, based on SAP NetWeaver) to SAP HANA or migrate SAP HANA as a source DB to SAP HANA as a target DB, use appropriate method and tools.

SAP Software Provisioning Manager (SWPM) is a tool that performs software provisioning processes such as system installation, system copy and migration, system rename, and dual-stack[1] split (SAP Business Suite system and SAP NetWeaver system). SWPM is delivered with the SAP Software Logistics Toolset. SWPM calls the R3load process at the OS level for migration of the SAP Advanced Business Application Programming (ABAP) stack DB objects, and the Jload process for migration of the SAP JAVA stack DB objects.

Table 1-1 on page 5 shows possible migration methods and tools for various common scenarios.

> **Note:** Table 1-1 on page 5 addresses only migration to SAP HANA DB on Power Systems as a target OS.

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[1] SAP Software Provisioning Manager: Dual-stack split case, found at:
   https://support.sap.com/en/tools/software-logistics-tools/software-provisioning-manager.html

Table 1-1   Tools and methods for SAP HANA to SAP HANA migration

Source database	Target SAP HANA on Power Systems	SAP application?	Method and tool
Non-SAP HANA DB type	SAP HANA 1.0 Big Endian SAP HANA 2.0	Yes	► SWPM (R3load and Jload) ► Database Migration Option (DMO)
SAP HANA 1.0 Big Endian	SAP HANA 1.0 Big Endian	Yes	► SWPM (R3load and Jload) ► SAP HANA System Replication (HSR) ► Backup and recovery
SAP HANA 1.0 Big Endian	SAP HANA 1.0 Big Endian	No	► HSR ► Backup and recovery
SAP HANA 1.0 Little Endian	SAP HANA 1.0 Big Endian	Yes	► SWPM (R3load and Jload)
SAP HANA 1.0 Big Endian	SAP HANA 2.0	Yes	► SWPM (R3load and Jload) ► SAP HANA migration tool ► Combined SWPM and SAP HANA migration tool
SAP HANA 1.0 Big Endian	SAP HANA 2.0	No	► SAP HANA Migration Tool
SAP HANA 1.0 Little Endian	SAP HANA 2.0	Yes	► SWPM (R3load and Jload) ► Backup and recovery ► HSR
SAP HANA 1.0 Little Endian	SAP HANA 2.0	No	► Backup and recovery ► HSR
SAP HANA 2.0	SAP HANA 2.0	Yes	► SWPM (R3load and Jload) ► HSR ► Backup and recovery
SAP HANA 2.0	SAP HANA 2.0	No	► Backup and recovery ► HSR

The SAP HANA Migration Tool is a toolkit that comes with the SAP HANA 2.0 installation package for Power Systems. It performs the migration and conversion of all DB objects from SAP HANA 1.0 Big Endian for Power Systems to SAP HANA 2.0 Little Endian for Power Systems. Chapter 3, "Migrating SAP HANA to SAP HANA on IBM Power Systems" on page 17 describes the procedure for using this tool.

Note: Endianness means the order in which a sequence of bytes is stored in the computer memory. For more information, see SAP Note 552464.

DMO is a tool that is integrated into the SAP Software Update Manager (SUM) tool. The SUM tool is delivered with the SAP Software Logistics Toolset.

HSR is an SAP HANA Platform feature for replicating one source SAP HANA DB to a target SAP HANA DB. It is primarily used for disaster recovery (DR) and high availability (HA) purposes, but it also can be used to migrate the SAP HANA DB.

Warning:

► For backup and recovery and HSR methods, see SAP Note 1948334. The same path for SAP HANA updates must be followed for backup and recovery and System Replication.

► For more information about backup and recovery and homogeneous system copy, see SAP Note 1642148 SAP Note 1642148 and SPA Note 1844468.

► Before installing SAP HANA 1.0 or 2.0 on Power Systems, see SAP Note 2188482.

► For more information about an overall compatibility check, see the SAP Product Availability Matrix (PAM).

2

Migrating SAP systems from a non-SAP HANA DB to an SAP HANA on IBM Power Systems DB

This chapter introduces the methods and tools that are provided by SAP to migrate SAP systems and applications (for example, SAP NetWeaver) from a non-SAP HANA source database (DB) (Oracle, IBM Db2®, or Microsoft SQL Server) to an SAP HANA on Power Systems DB.

The following topic is described in this chapter:

► The SAP Software Provisioning Manager tool and the R3load and Jload processes

2.1 The SAP Software Provisioning Manager tool and the R3load and Jload processes

When you migrate an SAP application from any other source DB to SAP HANA, you are performing a heterogeneous system copy (see 1.1.2, "Heterogeneous system copy concept" on page 3). In this case, you must work with the appropriate SAP migration tools for migration. This migration consists of exporting the entire DB to DB-independent export (dump) files in the source, and then importing them in to the target DB.

> **Note:** This section describes migration from other DB types to SAP HANA. This migration does not apply to SAP/4SAP HANA and BW/4SAP HANA products because they run in SAP HANA only.

2.1.1 The SAP Software Provisioning Manager tool

The SAP Software Provisioning Manager (SWPM) performs software provisioning processes such as system installation, system copy and migration, system renaming, and dual-stack splitting. The SWPM is part of the SAP Software Logistics Toolset.

Since SAP Software Logistics Toolset 1.0 SPS 23, there are two versions of SWPM available: Version 1.0 and Version 2.0.

Version 1.0 supports provisioning of SAP systems of any supported DB type other than SAP HANA. Version 2.0 supports provisioning of SAP systems on SAP HANA only.

For version 1.0, there are two options: one for SAP systems that are based on NetWeaver 7.0X, and one for SAP systems that are based on NetWeaver higher than 7.0X (for example, 7.4 and 7.5).

Figure 2-1 shows SWPM 1.0 for SAP NetWeaver-based systems higher than 7.0X. All SAP products are available in one tool that contains the capabilities of SAP Software Logistics Toolset.
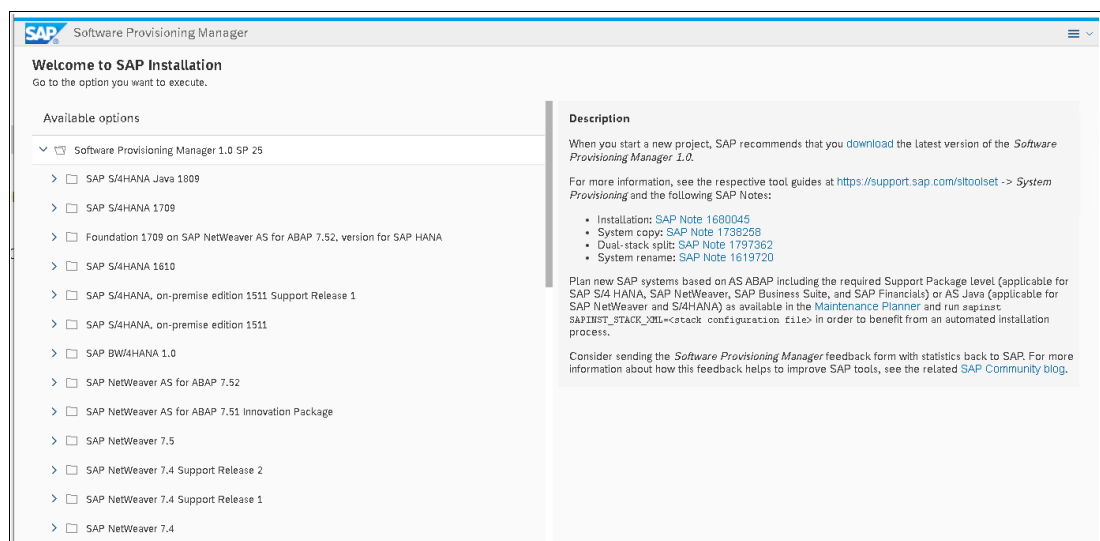

Figure 2-1   Software Provisioning Manager initial window

Note: SAP Software Logistic Toolset is a toolbox where SAP delivers all the provisioning, upgrade, and update tools together, such as the Software Update Manager (SUM) tool and SAP Provisioning Manager (see Figure 2-2). Previously, SAP tools were delivered together with individual product releases so that the Software Logistic Toolset for that product could be updated or enhanced only with a new version of the product. SAP now delivers these tools with the Software Logistics Toolset, which is updated several times a year, so you get the latest improvements and updates in time. The tool delivers software logistics tool improvements on a continuous basis that is independent from SAP application product shipments.
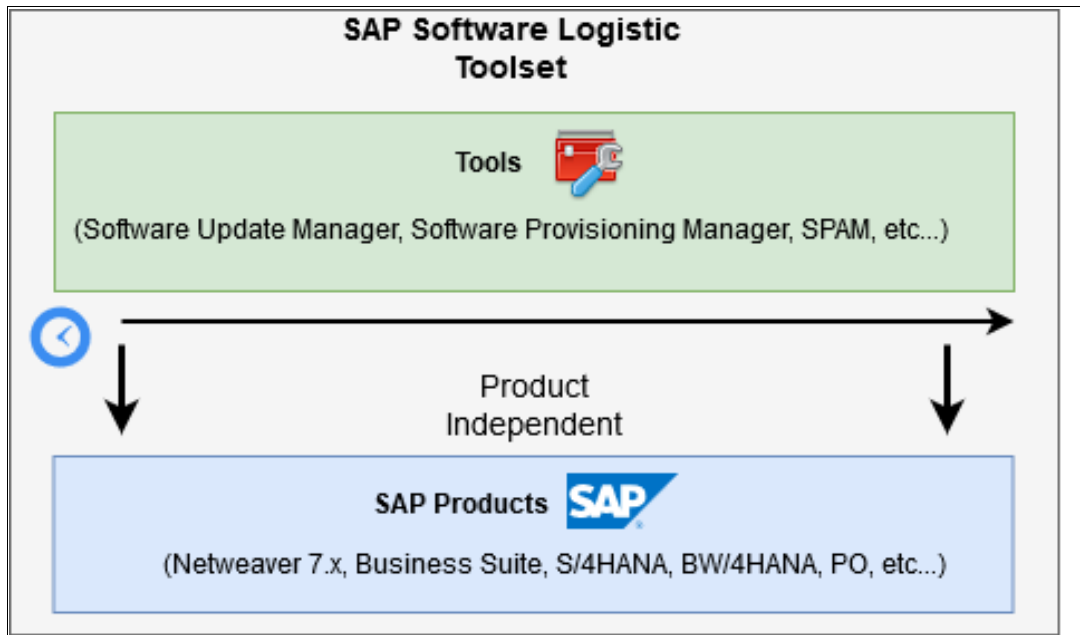
For more information, see SAP Software Logistics Tools.

Figure 2-2   SAP Software Logistic Toolset

Software Provisioning Manager window for export and import
Figure 2-3 shows the SWPM window for migrating by using the System Copy option. The options for exporting from a source and importing in to a target are available.
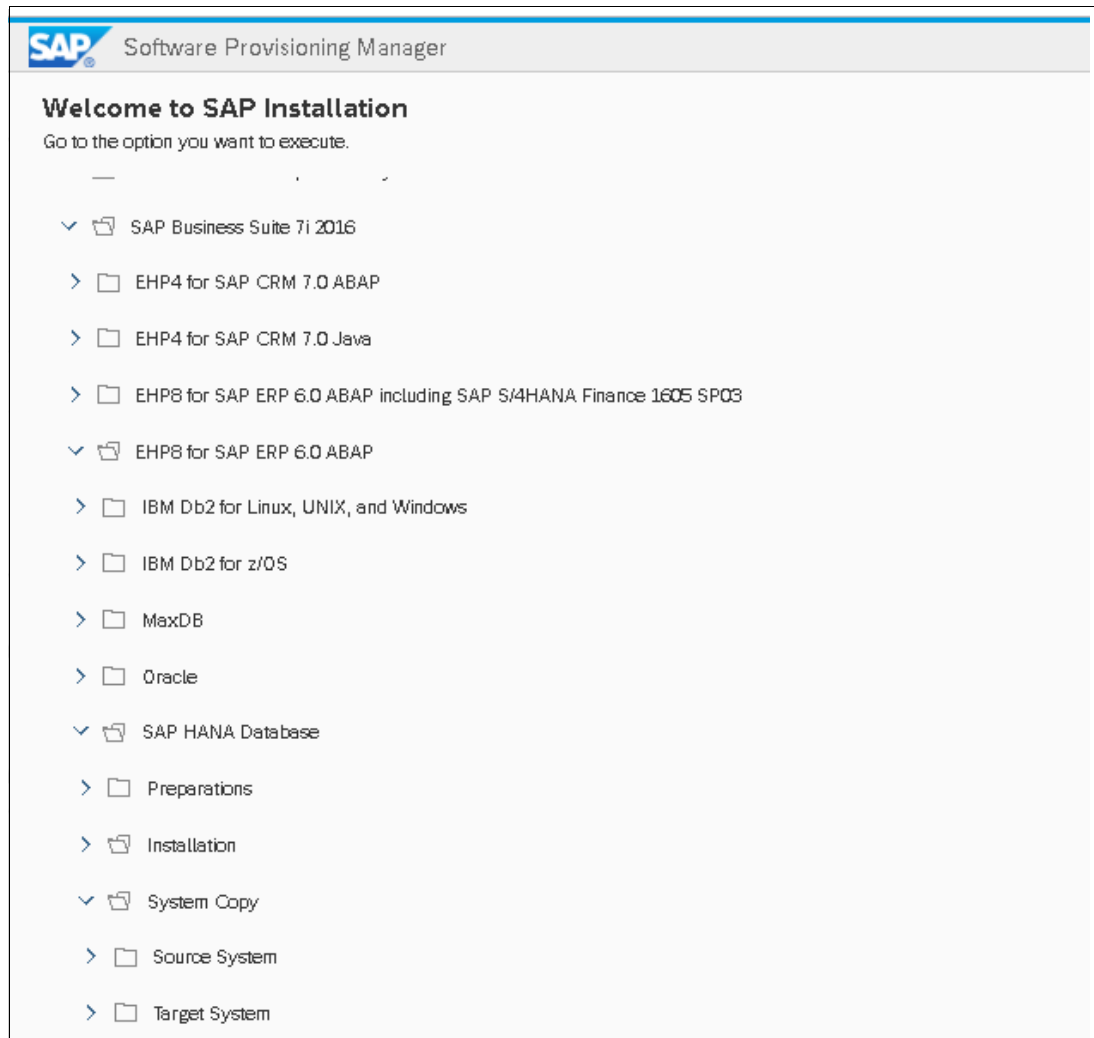

Figure 2-3   System Copy options in Software Provisioning Manager initial window

2.1.2 The R3load and Jload processes

The R3load and Jload processes are the core of the migration process. They are called by the SWPM and run in the background at the operating system (OS) level to generate the DB-independent export files during the export of the source system. Then, they import the DB into the target DB (as called by the SWPM from the target side).

R3load exports and imports SAP NetWeaver Advanced Business Application Programming (ABAP) based products, and Jload exports and imports SAP NetWeaver Java based products.

Table 2-1 on page 11 shows the capabilities of the R3load and Jload processes.

Table 2-1   Capabilities of R3load and Jload processes

R3load process capabilities	Jload process capabilities
Implementation is DB- and platform-specific.	NetWeaver version-specific.
Dump format is independent of DB and platform.	Dump format is independent of DB and OS.
Efficient data compression.	Efficient data compression.
Data integrity is checked by the checksum calculation.	Data integrity is checked by the checksum calculation.
Syntax check of R3load control files.	N/A.
Parallel call of multiple R3load processes is common.	Multiple Jload processes can run simultaneously.
Restart-capable for data export and import.	Restart-capable for data export and import.
Requires migration key for heterogeneous data import.	Exports Java metadata (dictionary definitions) and table data.
Table splitting.	Table splitting.
Character set conversion (EBCDIC and Unicode).	N/A.

2.1.3 Advanced migration techniques for Software Provisioning Manager and R3load and Jload

One common problem with migration of SAP systems is the time that is taken for the export and import processes. For example, when migrating an SAP system with a large DB, it can take a long time for the entire export and import to complete, making it challenging to find a migration window that is feasible for the enterprise.

In this case, there are options that are available to speed up the export and import processes.

Parallel export and import

In a standard migration process, the export of the entire DB is carried out first, and then the export files are copied to the target server host. Then, the import process can be started. With the parallel export and import, the migration can be set up so that the import process in the target system is carried out in parallel with the export.

To transfer the export files from the source to the target environment, the tool provides two options:

► Transfer the files by using the integrated FTP utility.
► Transfer Network File System (NFS) shares from the source environment to the target environment.

Choose one of these two options based on the latency of your network.

The parallel export and import feature is integrated into the SWPM. In the SAP System Database Export window for setting up export parameters, there is the **Perform Parallel Export and Import** check box, as shown in Figure 2-4.
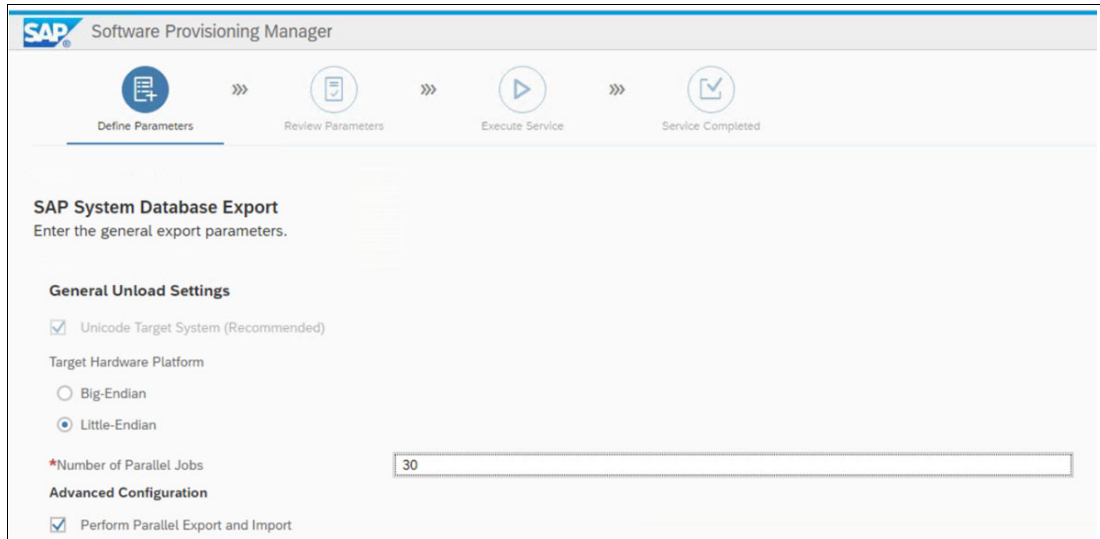

Figure 2-4   Perform Parallel Export and Import check box in Software Provisioning Manager

Figure 2-5 shows the Data Transfer options that you can choose: NFS or FTP.
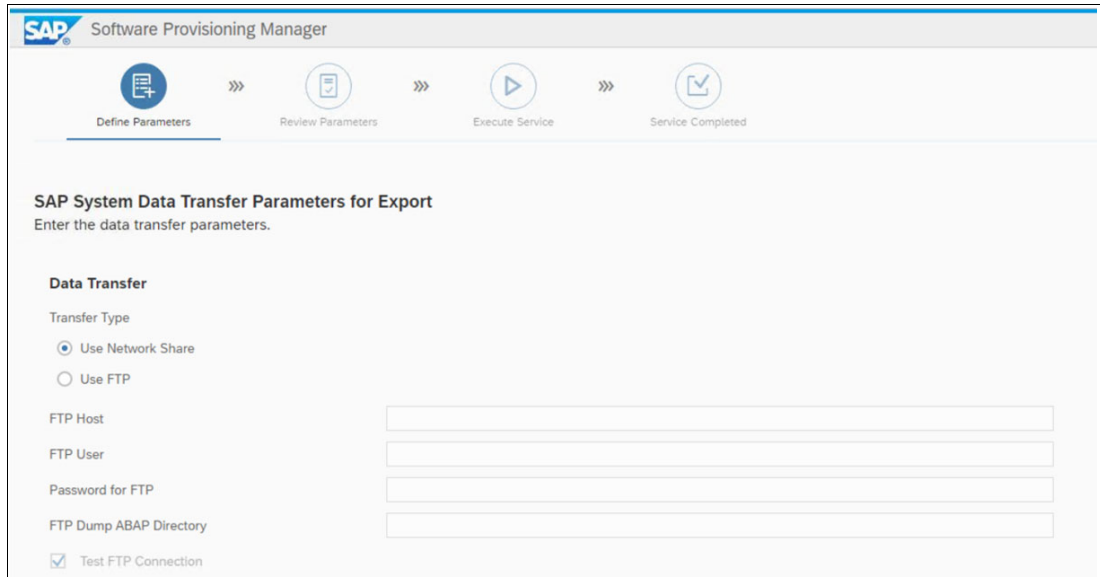

Figure 2-5   SAP System Data Transfer Parameters for Export in Software Provisioning Manager

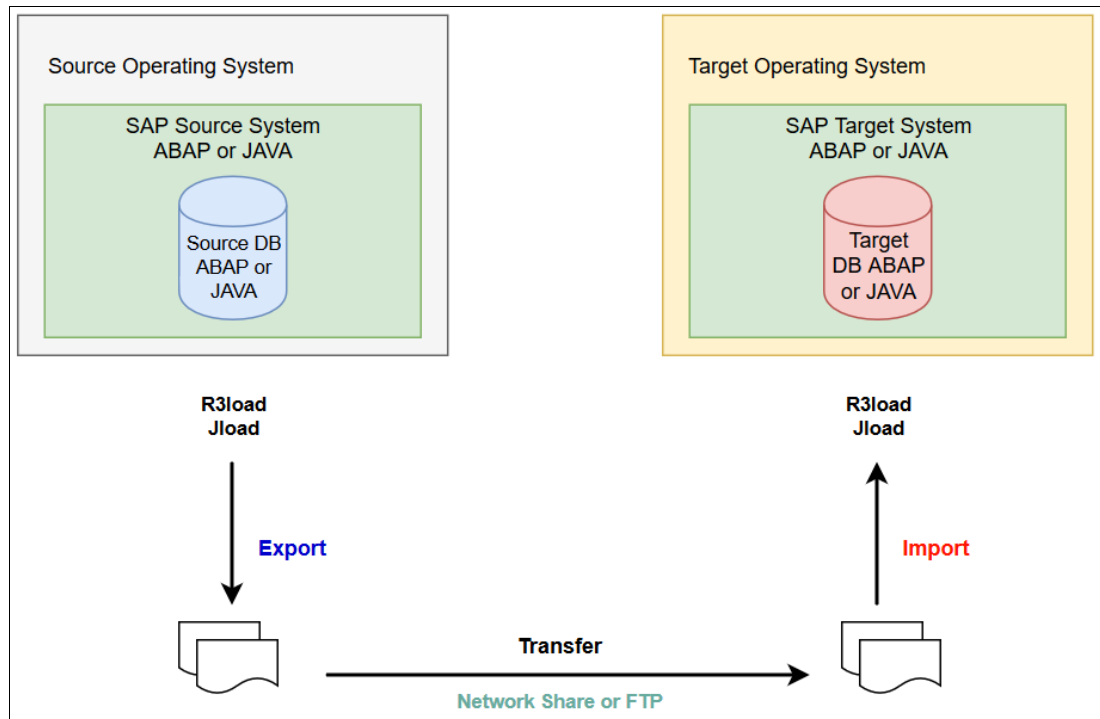Figure 2-6 illustrates how the parallel export and import works.

Figure 2-6   Parallel export and import illustration

Table splitting

Another advanced and useful technique to speed up the migration process is *table splitting*. When using the standard configuration for the export process, all tables are exported by one R3load process each. Depending on the size of the tables, the export process can take a long time.

By using the table splitting technique, large tables of the source DB can be exported as a number of predefined segments. The table is exported in parallel by several R3load processes, one for each table segment.

A text file must be created that defines the splitting criteria of each table to be exported in parallel. Each table is alphabetically defined by name, followed by a % and the number of segments to split the table into. For example, *CDCLS%30* splits the table CDCLS into 30 segments.

Then, SWPM splits the defined tables by using the R3ta process from the SAP system kernel. The R3ta process creates text control files for each table that define the split criteria, which are based on the primary key data from the table, and they are automatically chosen by the R3ta processes. Then, this information is used by the R3load process to split the export of the table into parallel processes.

After the export process starts, one R3load process starts for each split of the table, which speeds up the table export.

In the SWPM SAP System Split STR Files window (when splitting tables, this window is used before the export process), select and define the parameters for the splitting tool, as shown in Figure 2-7.
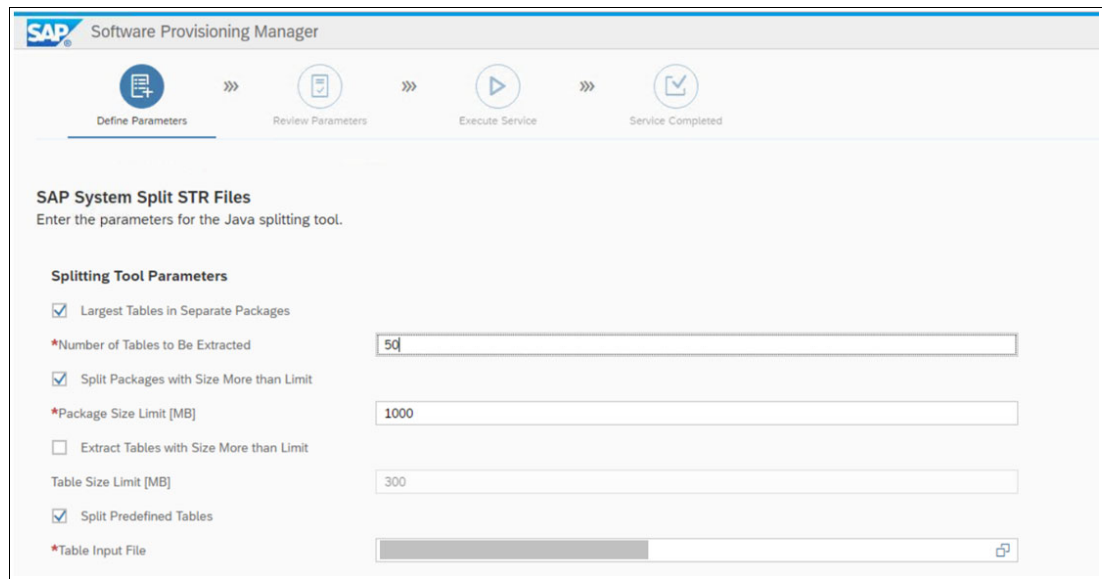

Figure 2-7   Table splitting options in Software Provisioning Manager

Database tuning

Before you start the export process, adjust your source DB to optimize the export. At the SAP Support Portal, you can search for SAP Notes about tuning the source DB. For example, if the source DB is Oracle, you can use SAP Note 936441 to apply important recommendations before starting the export.

> **Note:** For more information about all the prerequisites, necessary preparation activities, and details about migration advanced techniques, see the *SAP System Copy Guide* for your SAP system version. For more information about the SWPM tool, see the *SAP Installation Guide* for your SAP system version. You can find this documentation by going to the Guide Finder for SAP Netweaver and ABAP Platorm.

2.1.4 Database Migration Option tool

Database Migration Option (DMO) is an SAP tool for migrating SAP systems. It is based on SAP NetWeaver to SAP HANA DB. DMO is integrated in to the SUM tool. The SAP environment supports migrating to SAP HANA DB, and the SUM tool facilitates migration by using DMO in phase PREP_INPUT/MIG2NDDB_INI, as shown in Figure 2-8.
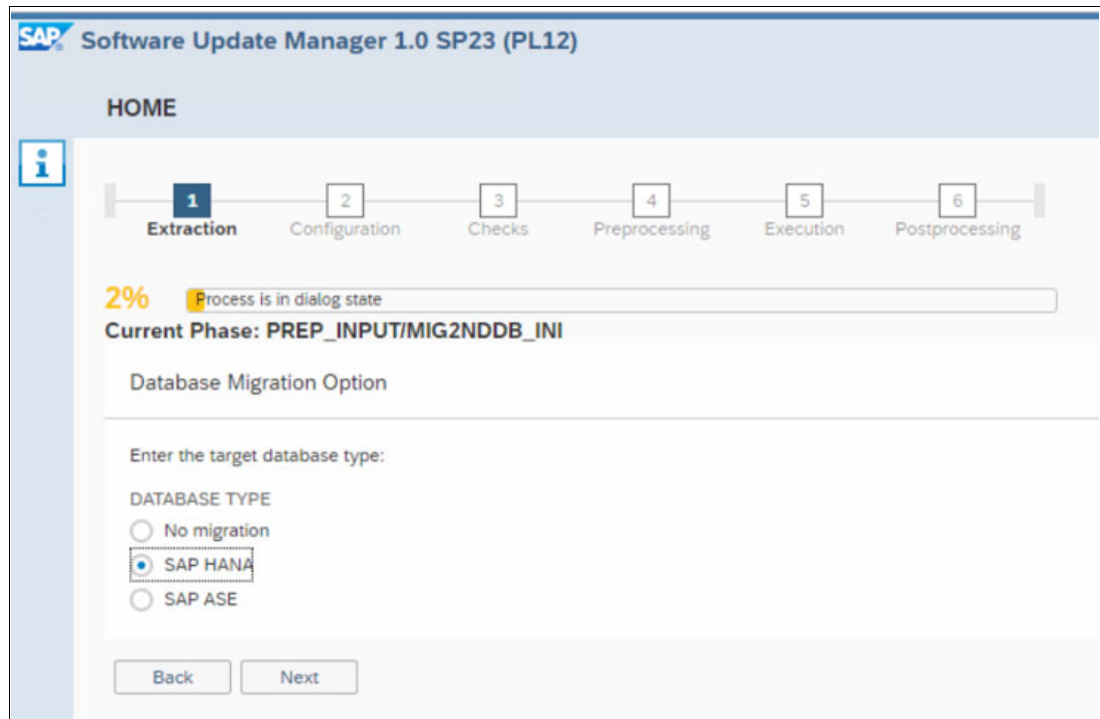
Figure 2-8   DMO option window in the Software Update Manager tool

Because DMO is a component of the SUM tool, it is also part of the Software Logistics Toolset, so it is updated on a regular basis regardless of SAP products releases.

With DMO, you cannot migrate your SAP system to SAP HANA or perform a combined SAP upgrade or Support Package update and migration to SAP HANA in one step. Because DMO is integrated into the SUM tool, it uses all the SUM tool capabilities for the upgrade or update.

Another advantage of the DMO option is that the source system is not altered during the upgrade or update and migration process. All upgrade and update processing is performed in the target system, which means that there is an instant reactivation of the source system if there are any problems or failures during the DMO process. Figure 2-9 shows an overview of the DMO update and upgrade migration process.
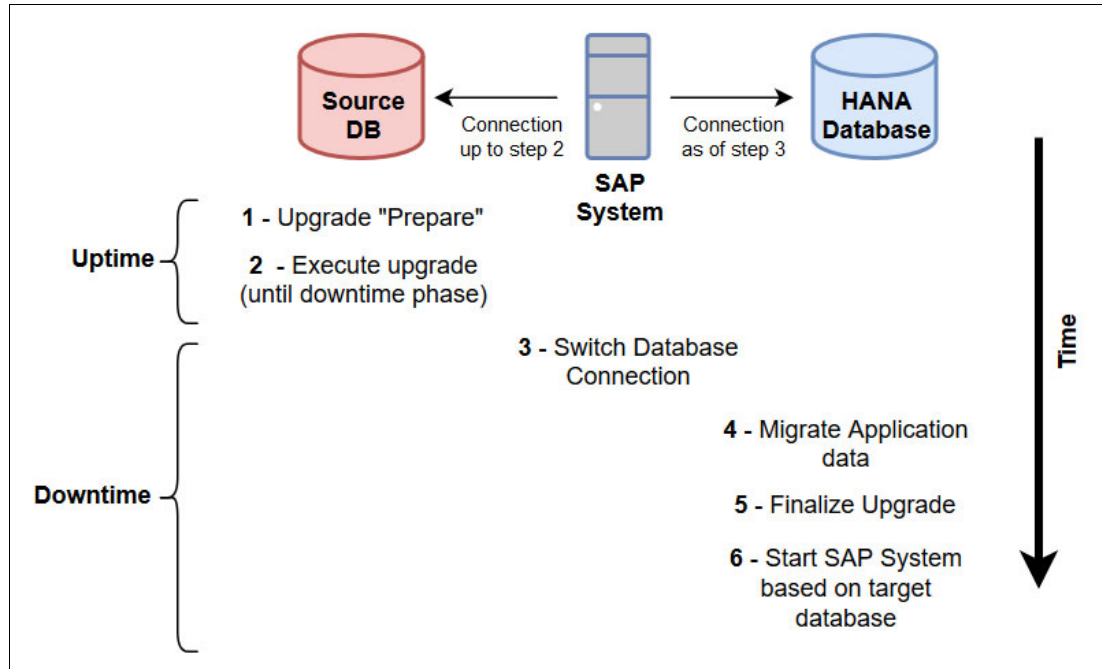

Figure 2-9   DMO functioning diagram

DMO performs table splitting and most of the preparation steps automatically (for example, it generates the DDL statements by using report SMIGR_CREATE_DDL).

When DMO was released, migrating only the DB to SAP HANA was supported. The application environment had to be migrated manually.

Starting with SUM 1.0 SP20, SAP introduced a new feature for DMO called *DMO with System Move*. With this new feature, you can migrate your entire SAP system by using DMO, that is, the DB and the SAP application servers.

> **Caution:** DMO is not supported for migration from SAP HANA DB to SAP HANA DB.

For more information about how to work with DMO for migration to SAP HANA DB and all the necessary preparation activities, see *Database Migration Option: Target Database SAP HANA*, which can be found at the SAP Help Portal. Also, see the DMO release SAP Note for the version of the SUM tool that you are using. For example, for DMO with SUM 2.0 SP07, see SAP Note 2840346.

3

Migrating SAP HANA to SAP HANA on IBM Power Systems

This chapter covers the methods and tools for the migration of an SAP system on an SAP HANA database (DB) (for example, based on SAP NetWeaver) and native applications running on an SAP HANA to IBM Power Systems DB.

The following topics are described in this chapter:

► Migration of SAP systems on SAP HANA DB
► Migrating native applications on SAP HANA DB

3.1 Migration of SAP systems on SAP HANA DB

If you plan to migrate an SAP system running on an SAP HANA DB to an SAP HANA on Power Systems DB, the following tools or methods can be used:

► Tools and methods for an SAP HANA DB source and target running on the same endianness[1]:
  – SAP Software Provisioning Manager (SWPM) (R3load and Jload)
  – Backup and recovery
  – SAP HANA System Replication (HSR)

► Tools and methods for an SAP HANA DB source and target running on different endianness:
  – SWPM (R3load and Jload)
  – SAP HANA Migration Tool and Smart Data Integration or Smart Data Access, which is used only when migrating from SAP HANA 1.0 on Power Systems to SAP HANA Database 2.0 on Power Systems

Note: Endianness means the order in which a sequence of bytes is stored in the computer memory. For more information, see SAP Note 552464.

3.1.1 Software Provisioning Manager (R3load and Jload)

The SWPM tool can be used to migrate SAP systems running on SAP HANA from the same or different endianness. For more information about how this tool is used for migration, see 2.1.1, "The SAP Software Provisioning Manager tool" on page 8.

3.1.2 Backup and recovery

This section describes the backup and recovery option for SAP system migrations. The following items apply when using this method:

► The source and target SAP HANA DBs must have the same endianness.

► For SAP HANA 1.0, there is no support to take a backup of a single container system and restore it on a multi-tenant DB system. Only a backup from a tenant DB system can be used to copy it into a tenant of another DB system.

► The source and target SAP HANA version or revision must follow the path that is described in SAP Note 1948334 or the recovery fails.

► If the SAP HANA source DB is a multi-node environment, the target SAP HANA DB must be multi-node too (and vice versa), and it must have the same topology (same number of nodes and services, like the indexserver).

Note: SAP HANA 1.0 on Power Systems is Big Endian only. SAP HANA 2.0 on Power Systems is Little Endian only.

The complete procedure for backup and recovery for SAP systems running on SAP HANA is described in SAP Note 1844468.

---

[1] Endianness described at `https://techterms.com/definition/endianness`.

Hint: If you migrate the system by using the backup and recovery method and must convert from a multi-node environment to a single node system, follow the procedures that are documented in SAP Note 2093572 and SAP Note 1844468.

For more information, see the following documentation:

► SAP Note 1642148.
► SAP Note 2096000.
► The SAP HANA Administration Guide for the SAP HANA version you are working with, which you can find at the SAP Support Portal.

3.1.3 SAP HANA System Replication

HSR can copy and continuously synchronize an SAP HANA DB to a secondary location in the same or a remote data center. System replication is used to support high availability (HA) and disaster recovery (DR), but it also can be used for system copies.

When you configure HSR, it first performs an initial synchronization of the entire DB from the primary SAP HANA environment (source) to the secondary SAP HANA environment (target). Then, continuous replication ensures synchronization until a takeover is made in the secondary environment, as shown in Figure 3-1.

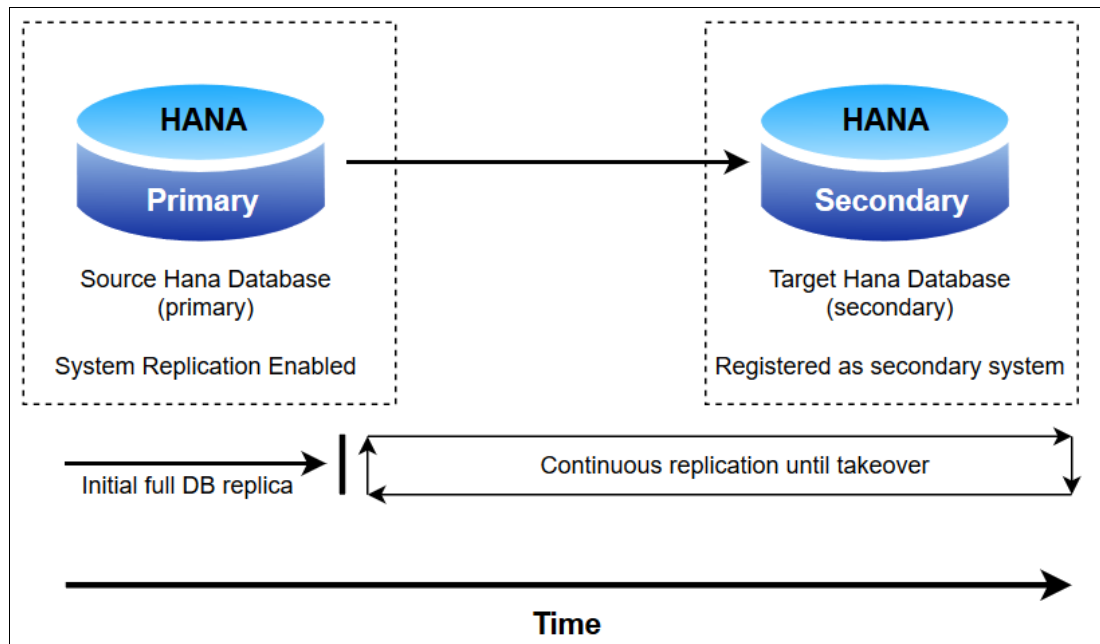*Figure 3-1   SAP HANA System Replication diagram*

The following constraints apply when working with HSR:

► The source and target SAP HANA DBs must have the same endianness.

► There is no support to perform an HSR from an SAP HANA 1.0 single container to an SAP HANA 1.0 multi-tenant DB container (MDC) tenant DB or from SAP HANA 1.0 single container to an SAP HANA 2.0 MDC tenant DB.

- If the source and target SAP HANA version or revision are different, they must follow the path that is described in SAP Note 1948334 or the takeover fails.
- If the SAP HANA source DB is a scale-out environment, the target SAP HANA DB must be scale-out and have the same topology (same number of nodes and services, such as the indexserver).

Migration preparation with SAP HANA System Replication

To migrate an SAP system based on SAP NetWeaver on an SAP HANA DB by using HSR, do an initial installation of an SAP HANA DB with the same topology as the source SAP HANA DB (single-node, multi-node, and number of services) and an initial installation of an SAP system of the same source version in the target environment (SAP NetWeaver 7.X, SAP Business Suite ECC, CRM, and so on).

Configuring SAP HANA System Replication

After the initial installation completes, configure the HSR. The HSR configuration enables the system replication in the primary (source) SAP HANA system and registers the secondary (target) SAP HANA system to the primary one.

To enable and register the SAP HANA environments, you can use SAP HANA Studio, SAP HANA Cockpit, and the SAP HANA command line.

There are a few prerequisites:

- An initial DB backup of the primary SAP HANA DB must exist. In an SAP HANA MDC environment, the system DB and all tenant DBs must be backed up.
- The `log_mode` parameter in the primary SAP HANA DB must be set to `normal`. In an SAP HANA MDC environment, this parameter must be `normal` for all tenant DBs.
- In SAP HANA 2.0, the public key infrastructure (PKI) Secure Stores in the File System (SSFS) key and data file must be copied from the primary SAP HANA system to the target SAP HANA system in the same path. The keys locations are:
  - `/usr/sap/<SID>/SYS/global/security/rsecssfs/data/SSFS_<SID>.DAT`
  - `/usr/sap/<SID>/SYS/global/security/rsecssfs/key/SSFS_<SID>.KEY`
- The primary and secondary SAP HANA systems must have the same system ID (SID).
- The primary and secondary SAP HANA systems must have the same instance number.

In the command line, you can enable HSR in the primary SAP HANA system by completing the following steps:

1. Run the `hdbnsutil` command as the *<sid>adm* user, and using the syntax shown in Example 3-1.

   Example 3-1   SAP HANA System Replication: Enabling the primary by running the hdbnsutil command

   ```
   hdbnsutil -sr_enable --name=<siteName>
   ```

   The string `<siteName>` = `Alias` represents your primary system. Assign it as the primary system for system replication.

2. To check whether the system was successfully enabled for system replication, run the command that is shown in Example 3-2.

   Example 3-2   SAP HANA System Replication: Checking whether the primary is activated

   ```
   hdbnsutil -sr_state
   ```

3. To enable the secondary system, stop SAP HANA and run the command that is shown in Example 3-3 as the *<sid>adm* user.

Example 3-3   SAP HANA System Replication: Registering secondary system with the hdbnsutil command

```
hdbnsutil -sr_register --name=<secondarySiteName> --remoteHost=<primary_host>
--remoteInstance=<primary_systemnr>
--replicationMode=[sync|syncmem|async]--operationMode=[delta_datashipping|logre
play|logreplay_readaccess]
```

Where:

`--name`	Alias that is used to represent the secondary system.
`--remoteHost`	Name of the primary host that the secondary registers with.
`--remoteInstance`	Instance number of the primary.
`--replicationMode`	Log replication modes.
`--operationMode`	Log operation mode.
`--online`	If the system is running, you can use this parameter to automatically perform a system restart. Not relevant if the system is shut down.
`--force_full_replica`	Use this parameter to initiate a full data shipping. Otherwise, a delta data shipping is attempted.

4. After this command runs on the secondary system, SAP HANA starts the system replication process and synchronizes data from the source system. To check whether the system successfully registered for system replication, run the command that is shown in Example 3-4.

Example 3-4   SAP HANA System Replication: Checking whether the secondary system registered

```
hdbnsutil -sr_state
```

5. To see the initial full replica window that is shown in Figure 3-2, select **SAP HANA Studio → Landscape → System Replication**.

AB REPLICATION_STATUS	AB REPLICATION_STATUS_DETAILS	12 PORT
ACTIVE		30,007
ACTIVE		30,001
INITIALIZING	Full Replica: 0 % (49/7027 GB)	30,003

Figure 3-2   SAP HANA System Replication: Initial full replica running

Figure 3-2 shows that the replication started for the indexserver service, which has the DB.

After the initial full replica completes, the services' status change to ACTIVE, as shown in Figure 3-3.

	HOST		SECONDARY_HOST		REPLICATION_MODE		REPLICATION_STATUS		12 PORT	12 VOLUME_ID	SITE_ID		SITE_NAME	12
AB		AB		AB		AB		AB				AB		
					SYNC		ACTIVE		30,007	2	1			
					SYNC		ACTIVE		30,040	5	1			
					SYNC		ACTIVE		30,003	3	1			
					SYNC		ACTIVE		30,011	4	1			
					SYNC		ACTIVE		30,001	1	1			

Figure 3-3   SAP HANA System Replication: Replication in active status

6. When possible, complete the migration process by completing the following steps:

   a. Stop the source SAP system (not the SAP HANA DB).

   b. Perform a takeover on the SAP HANA secondary system.

   c. Start the target SAP system.

   d. Stop the source SAP HANA DB.

7. To perform the takeover on the SAP HANA secondary system, run the command that is shown in Example 3-5.

Example 3-5   SAP HANA System Replication: Takeover by using the hdbnsutil command

```
hdbnsutil -sr_takeover
```

For more information about the HSR prerequisites and procedures, see the following documentation:

► SAP Note 1999880

► SAP HANA System Replication Guide, found at the SAP Support Portal

3.1.4 Using SAP Software Provisioning Manager with the SAP HANA Migration Tool

If you are migrating from SAP HANA 1.0 on Power Systems to SAP HANA 2.0 on Power Systems, you can use the SAP HANA Migration Tool.

SAP HANA Migration Tool was developed to migrate from the Big Endian mode that is used in SAP HANA 1.0 for Power Systems to the Little Endian mode that is used in SAP HANA 2.0 for Power Systems.

SAP HANA 1.0 for Power Systems was developed for Big Endian mode only, and SAP HANA 2.0 for Power Systems was developed for Little Endian only, so it is not possible to use the backup and restore or HSR methods.

You can use the SAP HANA Migration Tool to migrate the entire source Big Endian DB to the target Little Endian system. But the SAP HANA Migration Tool is not as fast or efficient as the SWPM. Therefore, using the SAP HANA Migration Tool by itself can take considerable time if you migrate a large-sized DB.

The migration of an SAP HANA 1.0 DB to SAP HANA 2.0 cannot be done by using only the SWPM. SAP HANA 1.0 has some required schema objects that the SWPM cannot migrate. Using a combination of both the SAP HANA Migration Tool to move these schema objects and the SWPM to migrate the core DB table data together can speed up the migration process compared to using the SAP HANA Migration Tool alone.

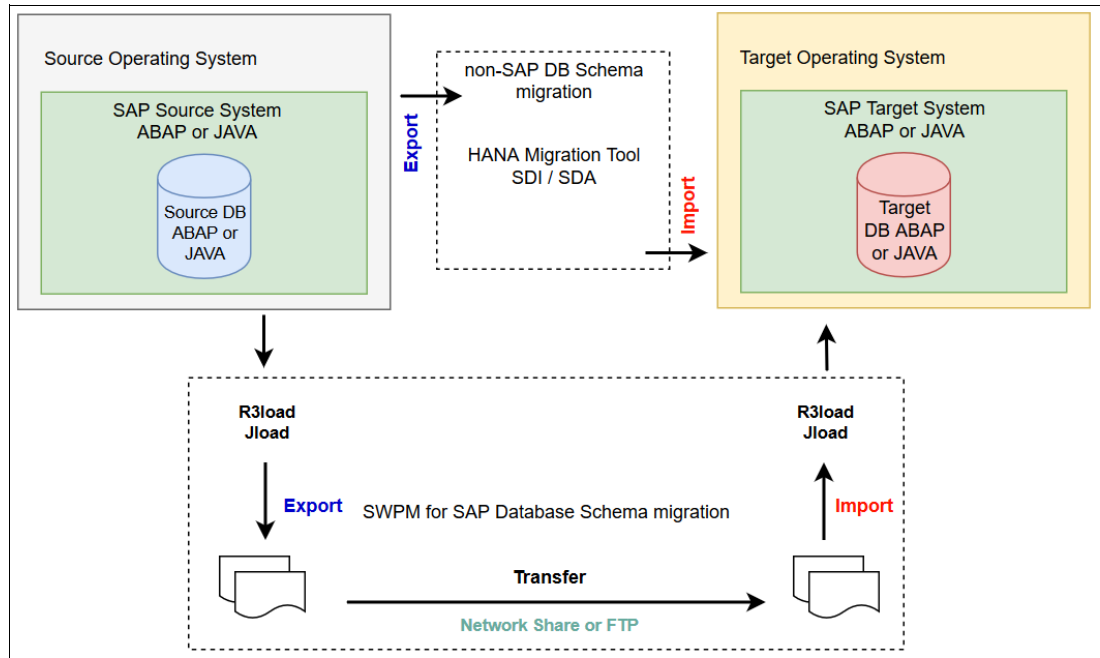The migration process that uses the SAP HANA Migration Tool combined with SWPM is shown in Figure 3-4.

Figure 3-4   SAP HANA migration tools

For more information about this procedure, see the following documentation:

► SAP HANA Big Endian to Little Endian Migration
► SAP Note 2802500
► SAP Note 2537080

3.2 Migrating native applications on SAP HANA DB

When migrating an SAP HANA system without an SAP application platform like SAP NetWeaver, S/4SAP HANA, or BW/4SAP HANA, it is not possible to use SWPM to migrate the DB because the tool exports SAP schema objects only, which are part of the SAP application platform. Native applications do not have supported SAP schema that the SWPM tool can migrate. This section describes other SAP tools and methods that can be used to migrate a native application from SAP HANA 1.0 to SAP HANA 2.0 on Power Systems.

3.2.1 Migrating an SAP HANA DB with the same endianness for native applications

For migrating SAP HANA with the same endianness (Big Endian to Big Endian or Little Endian to Little Endian), use the methods that are described in 3.1.2, "Backup and recovery" on page 18 and 3.1.3, "SAP HANA System Replication" on page 19.

> **Note:** SAP HANA DB Big Endian was released only on Version 1.0 for Power Systems.

3.2.2 Migrating an SAP HANA DB with different endianness

This case exists only if you have an SAP HANA Database 1.0 on Power Systems as the source DB because it is Big Endian only, and you must migrate to SAP HANA 2.0 on Power Systems (which is Little Endian only).

For other scenarios (SAP HANA Database 2.0 on Power Systems or SAP HANA 1.0 on X86 platform as the source DB), both source and target are in Little Endian mode.

Therefore, for this singular case, use the SAP HANA Migration Tool and see the following documentation:

► SAP HANA Big Endian to Little Endian Migration
► SAP Note 2537080

Related publications

The publications that are listed in this section are considered suitable for a more detailed description of the topics that are covered in this paper.

IBM Redbooks

The following IBM Redbooks publications provide more information about the topic in this document. Some publications that are referenced in this list might be available in softcopy only.

- ► *IBM Power Systems Security for SAP Applications*, REDP-5578
- ► *IBM Power Systems Virtualization Operation Management for SAP Applications*, REDP-5579
- ► *SAP HANA on IBM Power Systems: High Availability and Disaster Recovery Implementation Updates*, SG24-8432
- ► *SAP Landscape Management 3.0 and IBM Power Systems Servers*, REDP-5568

You can search for, view, download, or order these documents and other Redbooks, Redpapers, web docs, drafts, and additional materials, at the following website:

ibm.com/redbooks

Online resources

These websites are also relevant as further information sources:

- ► Guide Finder for SAP NetWeaver and Advanced Business Application Programming (ABAP) Platform

  https://help.sap.com/viewer/nwguidefinder
- ► SAP Support Portal

  https://support.sap.com/en/index.html
- ► Software Logistics Tools

  https://support.sap.com/en/tools/software-logistics-tools.html
- ► Welcome to the SAP Help Portal

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