



SAP Database Migration

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1.1 Introduction

This white paper describes the migration process of an existing SAP database to a new SAP database, i.e., migrating from an Oracle database to a SQL Server database or from a DB2 database to an SAP MaxDB database. This white paper will discuss the process and procedure for an SAP database migration and is not a step by step guide on how to complete an SAP database migration. If anything, it is to compliment and guide customers through the process.

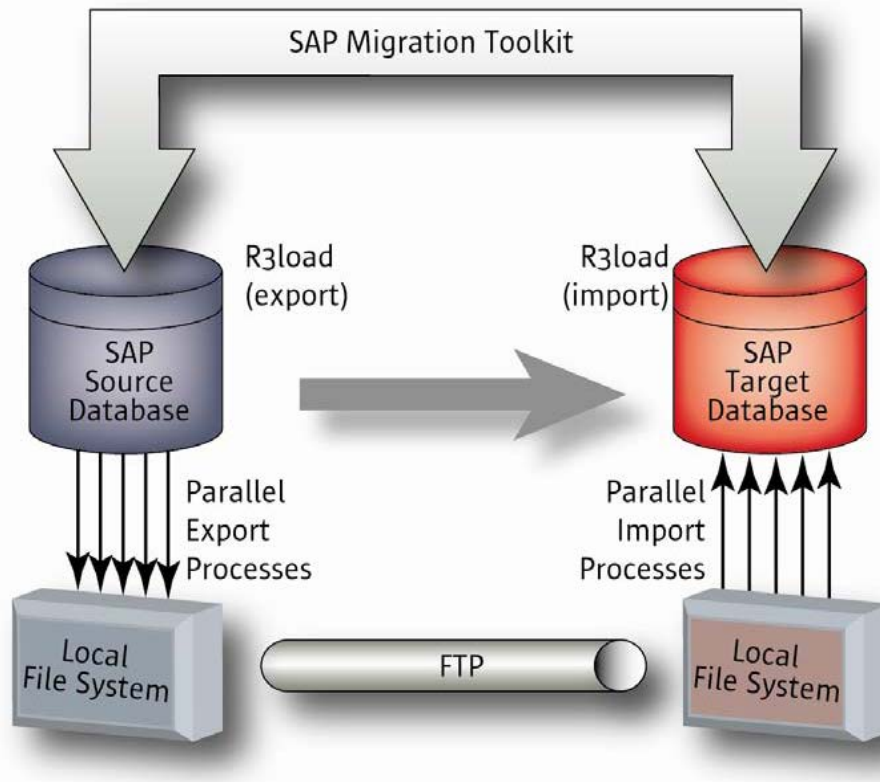


Fig. 1. SAP Database Migration Process Overview

1.2 System Copy Types for Database Migration

There are two types of system copy: homogeneous system copy and heterogeneous system copy. A homogeneous system copy is a migration of an SAP system to new hardware using the same operating system and database, i.e., Oracle on Windows to Oracle on Windows. A heterogeneous system copy is a migration of an SAP system to new hardware using either a different operating system and or a different database. I.e., Oracle on Windows to SQL Server on Windows, or Oracle on Windows to Oracle on Unix, or Oracle on Windows to DB2 on Unix. For this paper, we will focus on the migration of one database to another database. I.e., Oracle to SQL Server.

1.3 Database Migrations

There are a number of reasons that a database migration may be considered or required by an organization; out of date technology, out of date applications, hardware upgrade, and system growth. As systems grow, it can become necessary to reduce the number of servers in a landscape to reduce administration costs. Upgrading hardware technology could also lead to a reduction in maintenance and licensing fees. An increase in system size and usage could affect performance, and a migration to another database could be the required solution to regain lost performance. The size of the system could be another reason to move to a new database that performs better or gives a better solution based on the increased database size.

1.4 SAP Software Provisioning Manager

The latest approved method supported by SAP to migrate a database to utilize the Software Provisioning Manager tool. The following databases are supported by the tool:

- IBM Db2 for Linux, UNIX, and Windows
- IBM Db2 for z/OS
- SAP MaxDB
- Oracle
- MS SQL Server
- SAP ASE

The Software Provisioning Manager tool is the latest migration tool released by SAP and replaces release specific migration tools including SAPinst. As always SAP recommends that you use the latest possible version of available tools when performing a migration.

1.5 Archiving

Data Archiving is the process where in, huge volume of data is deleted from the system which has not been used for a long time. SAP recommends this process of data archiving to clean up the SAP standard tables, to improve the system performance and usability which yield to shorter response time. As part of the database migration project, you may need to include an archival of older data. However, after a database migration, SAP may not support all archived processes. If using the SAP archive feature, customers may not have access to the archived material from the newly migrated system. You will need to organize and define access to the stored archived file for the migrated system to access the data when needed.

SAP Archival process mainly involves the below steps:

1. Preprocessing Operation: This is an optional step, which makes the date/flag value set for the data which needs to be archived but doesn't delete the data. This is not found in all archiving objects.
2. Write Operation: It is a mandatory step which mainly writes the archival file in the logical file path before deletion occurs, based on the criteria chosen.
3. Delete Operation: It is a mandatory step which deletes the archival file which has been written out in the above step.
4. Read Operation: It reads the archived data from the storage area after the deletion.

SAP recommends a separate archiving migration project to ensure future access to the archive from a migrated system.

1.6 Migration Plan

When migrating a database, planning is very important, and timing can be everything. You need to plan when systems will be available and the best possible time for outages. You also need to take into consideration business processes cycles, for example, production closures, end of tax year, holiday periods, etc.

The timings of the migration through your entire landscape need to be planned and outlined since each system in your landscape will need to be migrated, i.e., Sandbox, Development, QA (Test), Training, Pre-Production, Production, etc.

Typically, there are two important tests to run when migrating a database. The first is testing the technical aspect of the migration which should be completed in a Sandbox or Development system. Preferably on a Sandbox system that does not affect the ongoing support of your SAP landscape. The second test is for timing for the actual migration steps, which is to plan outages that may affect ongoing support and business functionality. The larger the database size, the longer the migration steps will take and typically the largest database with a landscape is the Production

system. If a Pre-Production system is not available, then the ideal is to have a copy of the production system to test all processes in outside the production system.

Questions to consider when planning a migration include:

- How long will the migration take?
- How long will the system be unavailable?
- When will the system be unavailable?
- Will the business be affected?
- What is the risk of losing data?
- What are the costs?
- How will it affect the team and normal IT activities?
- Do we have a test environment?
- Can we have a copy of the production system?
- What versions of the database are compatible with the SAP system?
- How much business testing will be required and how long will it take?

1.7 Sorted Versus Unsorted Unload

During the migration, there is an option to export the database either sorted or unsorted. SAP's recommendation and the default setting is unsorted. The unsorted option is typically quicker.

1.8 Package Splitting

Due to their size, some database packages can take a long time to export. In this situation, it can be beneficial to split the package. The SAP default is to use the Package Splitter, which will improve the performance of the export.

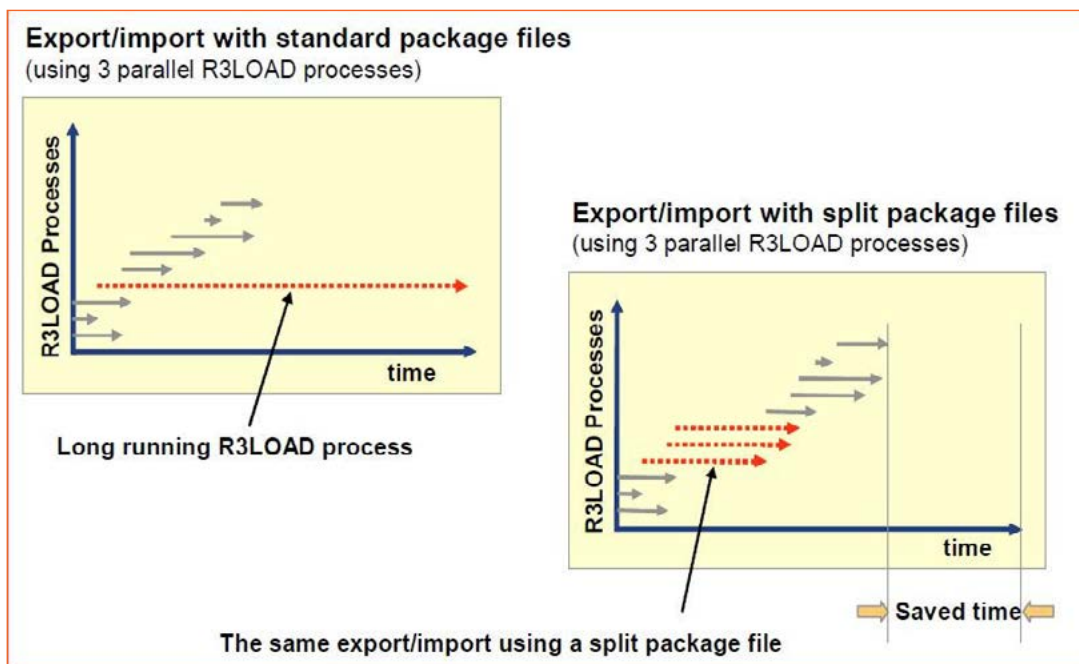


Fig. 2. Example of improved performance with Package Splitter.

1.9 Table Splitting

To improve the performance of the export it may be required to split very large database tables. The Table Splitter can be used to split a large table. The advantages of using the table splitter are that large tables are broken down into smaller packages; if the process stops for any reason during the export or import, then only the small packages must be resolved. For example, the export of the whole table does not have to start again. Multiple processes can be started in parallel to speed up the migration. However, there are also some disadvantages to take into consideration. If the parallel processing is not configured for optimal use, then the complete processing time for some table may actually increase. This may be one of the considerations during testing.

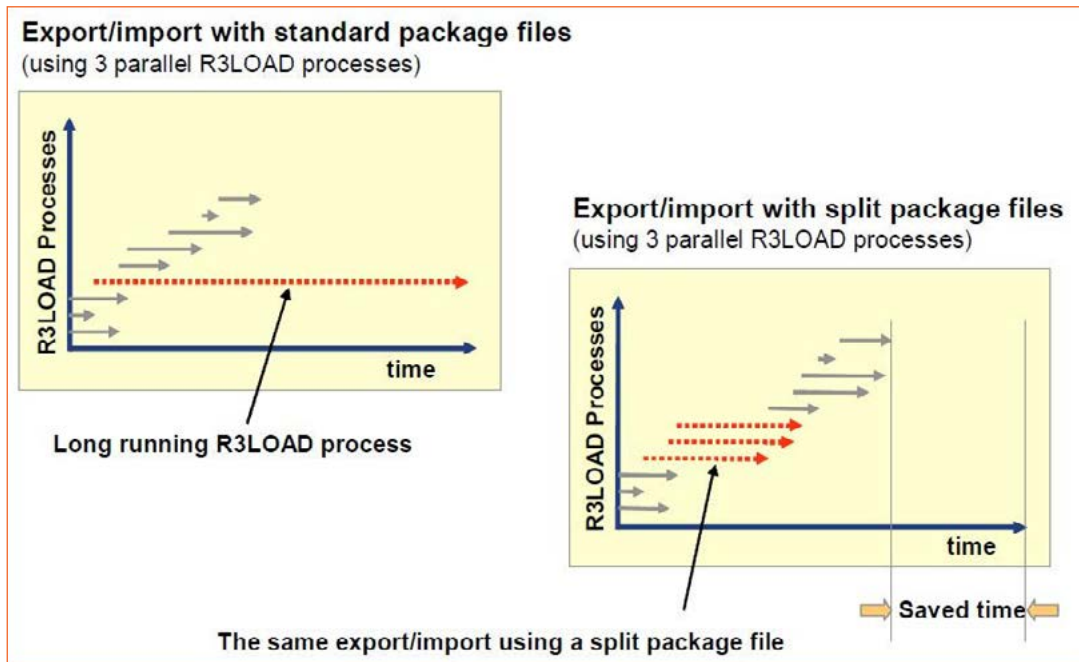


Fig. 3. Example of improved performance with Table Splitter

1.10 Migration Preparations

To ensure a consistent database migration process, the database to be migrated must be prepared.

Steps to Prepare the Database:

- Check the minimum kernel patch level is available.
- Check if canceled or pending update requests exist. Update these again or delete them.
- Change all scheduled background jobs from Released to Scheduled.
- Change the operation mode to ensure that operating modes does not change during the database migration.
- Confirm logical system names.
- Delete QCM tables.
- Ensure there is plenty of disk space for the export.
- Ensure that database log backup is enabled.
- Prepare the media required for the export.
- Oracle Database only. If using Oracle Database Vault, ensure that use Implementing Oracle Database Vault with the Installer. Check the contents of the TAORA and IAORA database tables and ensure that the entries are consistent.
- The following modules and components have specific product preparations that must be completed: FI module, Co module, and SAP BI/BW component.

1.11 Migration Procedure

Database Migration Steps:

- Ensure the preparations are complete.
- For heterogeneous database migrations generate a migration key via the SAP Portal. Using the SAP system installation number of the system to be migrated.
- Prepare the database for table splitting if required.
- Run Software Provisioning Manager tool.
- Follow the instruction to export the database.
- Prepare the SAP system to be migrated too as described in the installation guide based on the operating system and database required for the migration.
- Transfer the exported database files to the system for the migration system.
- Run Software Provisioning Manager tool
- Follow the instruction to migrate the database.
- Complete the installation by following the install

1.12 Post Activities

To complete the database migration, perform post activities:

- Install the SAP License Key
- Connect the system to SAP Solution Manager
- Complete ABAP Post Activities
- Complete Operating System Post Activities
- Complete Database Post Activities
- Complete SAP System Post Activities
- Complete Product-Specific Post Activities

1.13 Checking the Migrated SAP System

Complete the following tasks to check the migrated SAP system:

- Perform an initial system consistency check.
- Check the system log on all application servers.
- Check the consistency of the database
- Perform a server check.
- FI customers run the jobs SAPF190, RFUMSV00, RAGITT01, RAZUGA01, and RAABGA01.
- CO customers run the report group 1SIP.

1.14 Validate the Migrated SAP System

To validate the migrated SAP system, perform the following activities:

- Backup target system with imported SAP database
- Perform functional acceptance testing
- Perform performance testing
- Perform interface testing
- Perform DR testing

1.15 Conclusion

The general recommendation for the migration of an SAP Database is to use DMO with or without System Update. The *Heterogenous System Copy* is a reasonable alternative, but is more complex, and requires a certified consultant. SAP migrations are complex, and proper planning is needed to minimize any potential issues. We recommend that you first target smaller, standalone SAP systems to familiarize yourself with the outlined migration steps. Such systems could potentially be sandbox, development, training, demo, and SAP Internet Demonstration and Evaluation System (IDES) environments.

1.16 About Spinnaker Support

Spinnaker Support is the leading global provider of third-party support and managed services for enterprises that run SAP. Spinnaker Support clients gain more comprehensive and responsive service, save an average of 62% on their support fees, and can remain on their current software releases indefinitely. They trust Spinnaker Support to keep their enterprise applications running at peak performance and to help them navigate from on-premise to hybrid to cloud.

Spinnaker Support operates from nine regional operations centers located in Denver, London, Moscow, Mumbai, Paris, Singapore, Seoul, Tel Aviv, and Tokyo. Our award-winning blend of services span SAP, BusinessObjects, Oracle E-Business Suite, JD Edwards, Siebel, Oracle Database, Oracle Fusion Middleware products, Hyperion, Agile PLM, ATG/Endeca, and more.

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