S/4HANA Migration Introduction, Strategy, and Planning– Part 1

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Abstract SAP S/4HANA is SAP's next-generation ERP suite designed to provide businesses with enhanced speed, agility, and innovation capabilities. Data migration to S/4HANA is a critical component of the transition, ensuring that existing data from legacy systems is seamlessly transferred to the new platform. SAP S/4HANA's in-memory computing capabilities enable businesses to access real-time insights into their operations, facilitating expedited decision-making and responsiveness to market changes. Real-time analytics empower organizations to recognize trends, anticipate customer requirements, and optimize processes to achieve superior outcomes. The SAP S/4HANA Migration Cockpit is part of SAP S/4HANA and SAP S/4HANA Cloud and its use is included in these licenses. It is a ready-to-use solution that contains a comprehensive set of preconfigured migration objects such as customer, supplier, material, cost center, and so on. The proven methodology is integrated into the SAP Activate roadmap Transition to SAP S/4HANA. It is part of the SAP Model Company service and represents best practices in data transfer.

1. Introduction

S/4HANA Migration Cockpit – The S/4HANA Migration Cockpit is a comprehensive tool provided by SAP to facilitate the migration process from legacy SAP ERP systems to SAP S/4HANA. It offers a user-friendly interface and a set of preconfigured templates and tools to simplify and streamline the migration process. The Migration Cockpit comes pre-installed with SAP S/4HANA and does not require additional installation or setup. It contains a comprehensive set of preconfigured migration objects such as customer, vendor, material, and financial data, which can be easily mapped and migrated to the new system. It includes built-in data validation checks and error-handling capabilities to ensure data accuracy and integrity throughout the migration process.

ETL – ETL stands for Extract, Transform, Load, which represents a common process in data warehousing, migration, and analytics. The ETL process plays a critical role in data integration, consolidation, and analysis, enabling organizations to derive insights, make informed decisions, and drive business outcomes based on their data assets. ETL tools and platforms automate and streamline these processes, providing features for data extraction, transformation, loading, scheduling, monitoring, and error handling.

2. Approaches for SAP S/4HANA Transformation

In today's fast-paced business world, companies are constantly searching for ways to streamline their operations, boost efficiency, and embrace the latest technologies to stay competitive. SAP S/4HANA, the cutting-edge enterprise resource planning (ERP) suite, is crafted to meet these evolving needs. It offers real-time analytics, a more intuitive user experience, and simplified data management. As businesses embark on their SAP S/4HANA transformation journeys, they encounter three main approaches: Greenfield, Brownfield, and

Bluefield. Each approach comes with its own set of advantages and considerations. In this paper, we'll dive deep into these approaches, helping you grasp their nuances and make informed decisions.

Greenfield Approach: In the Greenfield approach, organizations implement SAP S/4HANA in a brand-new and autonomous environment, beginning from square one without any existing legacy systems. This method enables companies to construct a fresh system customized to their precise needs, capitalizing on the latest functionalities and best practices provided by SAP S/4HANA. The Greenfield approach offers the chance to reassess current business processes, discard obsolete practices, and devise new workflows optimized for the digital era. Because the Greenfield approach introduces SAP S/4HANA in a separate environment, it lessens the disruption to existing business processes. However, it does demand significant time and effort for tasks like data migration and training.
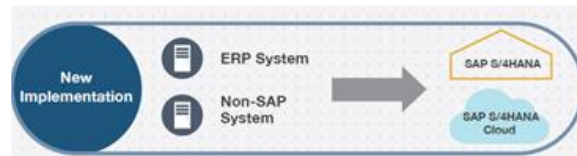
Brownfield Approach: In the Brownfield approach, organizations opt to transition their existing SAP ECC system to SAP S/4HANA. This strategy resembles renovating a familiar structure to meet contemporary standards. It enables companies to preserve their current system's investments while integrating the innovations and functionalities of SAP S/4HANA. The Brownfield approach presents a more expedited implementation timeline relative to the Greenfield method. It enables organizations to capitalize on their existing SAP infrastructure, thereby minimizing the necessity for extensive data migration and the reimplementing of business processes. Through the Brownfield approach, organizations can prioritize certain modules, processes, or business units for migration to SAP S/4HANA. This incremental method enables a phased transformation, thereby mitigating disruptions to ongoing operations.
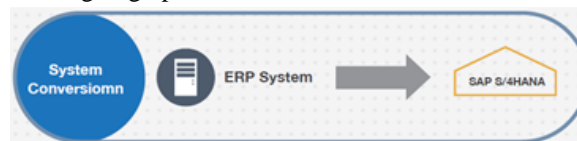
Bluefield Approach: The Bluefield approach amalgamates principles from both the Greenfield and Brownfield methodologies, providing a flexible strategy for SAP S/4HANA adoption. It entails establishing a new instance of SAP S/4HANA alongside the existing system and selectively migrating processes and data. This method enables organizations to navigate their transition to S/4HANA with adaptability and precision, leveraging the strengths of each approach to fulfill their distinct requirements and goals. With the Bluefield approach, organizations can enjoy the best of both worlds: they can integrate the innovative features of SAP S/4HANA while maintaining stability in crucial processes that are already well-established in the existing system. By carefully choosing which processes and data to migrate, organizations can reduce the risks that come with a complete system conversion. This method gives them more control over the migration process, allowing for thorough testing and validation before rolling out the changes across the entire system.
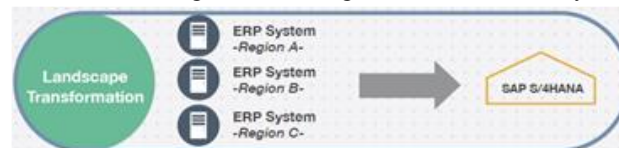

3. Essential Steps Involved in Data Migration

Data migration within an SAP system is a critical process performed programmatically to transfer data from diverse sources to various destinations, encapsulating a wealth of valuable information. It stands as one of the pivotal factors dictating the triumph or setback of the SAP S/4HANA implementation project, whether it entails system deployment, upgrade, or consolidation. For legacy migrations, businesses predominantly lean on ETL (Extract-Transform-Load) tools like SAP Data Services and Migration Cockpit to seamlessly load master data from any SAP or non-SAP system to a S/4HANA system with minimal downtime and reduced complexities. Let's explore the practical steps involved in ETL in greater detail:

Extract: This serves as the foundational step in crafting a detailed roadmap for extracting business data from the current source system. Here, crucial data, mission-critical workloads, and their interconnected dependencies are pinpointed, extracted, and purified with a focus on data correction and quality assurance. Subsequently, the refined data is loaded into the staging database while ensuring the uninterrupted operation of both the source and target systems.
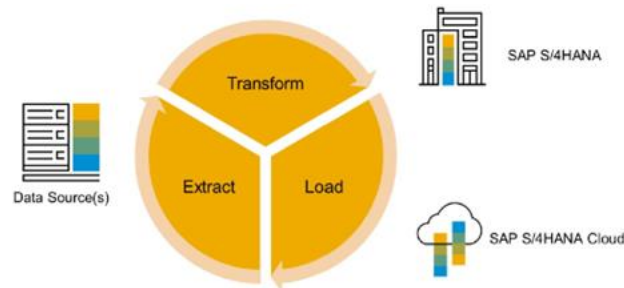

Transform: In this phase, the focus is on enhancing synchronization between existing legacy sources and SAP systems. Here, the extracted, cleansed, and thoroughly validated data is converted into an SAP-compatible format using a series of predefined functions. Ensuring accuracy at this stage can minimize inefficient data transfer, optimize data volume assessment, enhance technical validation, and improve resource utilization.

Load: The final stage involves loading fully processed and validated data into the relevant SAP module. Upon completion of all business and technical reconciliations, the data is deployed using the SAP S/4HANA migration cockpit. Following approval of the load, the business-ready data is seamlessly migrated into SAP S/4HANA with minimal disruptions.

4. Data Migration Utilizing Staging Tables

When migrating data using staging tables, the Migration Cockpit generates a series of database tables within the SAP HANA database, mirroring the structures of migration objects in your project. These tables are then populated with the desired data for migration. Subsequently, the Migration Cockpit transfers the data from the staging tables into the SAP S/4HANA System. Staging tables can be established either within the SAP HANA database of your SAP S/4HANA target system or within a distinct SAP HANA database. Starting from SAP S/4HANA release 1909 FP 1, it is possible to create staging tables within the same schema utilized by the SAP S/4HANA system. In earlier releases, a separate schema is necessary.
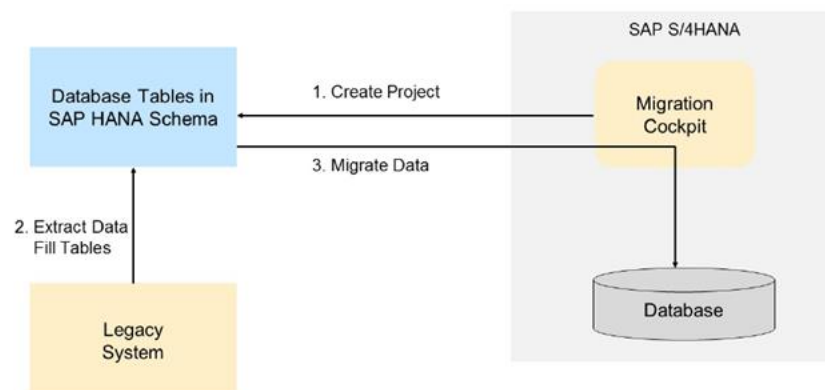
To establish a new schema, initiate by creating a database user in the SAP HANA Studio. This user necessitates no privileges beyond the default ones assigned during its creation. Consequently, this user becomes the proprietor of a database schema bearing the identical name. The database user within the SAP S/4HANA System must possess SQL privileges about the new schema. Next, you must register the database schema within the SAP S/4HANA system utilizing transaction DBCO.

To streamline the selection process and ensure that only connections pertinent to data migration are suggested when creating a project, it is crucial to register your connection with the Migration Cockpit. To achieve this,

initiate transaction SM30 and input table name DMC_C_WL_DBCO_OP. Opt for Maintain and proceed to select New Entries. Input the name of your connection and save the entry. This registration enables you to utilize the connection seamlessly for the creation of migration projects.

To initiate a migration project utilizing staging tables, begin by creating a new project within the Migrate Your Data application. Ensure that you configure the transfer option as "Transfer Data from Staging Tables." Assign a descriptive name to your project, allocate it a Mass Transfer ID, and select the desired database connection. You have the flexibility to choose between the local database schema of the S/4HANA system or a remote database connection. However, remote database connections must be previously registered in table DMC_C_WL_DBCO_OP.

To include objects in the project, simply select them from the left-hand side and use the right arrow button to add them to the project list on the right. Once you've added all necessary objects, click "Review" to move forward. Note that you can always add more objects later. In the "Review" stage, you'll see an overview of your project settings and the migration objects you've chosen. Here, you can make any necessary adjustments. Keep in mind that certain settings, like the migration approach and mass transfer ID, can't be changed after project creation. Once you're satisfied, hit "Create Project" to proceed. You can track the project's progress in the Running Activities view.

In the project overview, you'll see the migration object's name and the number of associated tables. Clicking on the table count reveals a summary of the staging tables, including their descriptions, technical names from the ABAP Dictionary, and the names of the physical tables in the database (prefixed with /1LT/). You can also view the number of records contained in each table. Clicking on the record count allows you to see the data within the staging table. Please note that for data protection reasons, you can only view the data here and cannot make any changes to it.

When you click on the name of a structure in the migration object, the system shows you its field list. This list includes the field name, field group, description, key flag, and mandatory flag. A key field must have a unique value for each record being migrated. If a field is marked as "Not Null," it must have a value assigned to it, even if it's just the initial value for that data type. Make sure to assign values to all mandatory fields, and keep in mind that these fields may be located lower down in the field list.

There are several ways to fill the staging tables. One method is to employ an ETL (Extract, Transform, Load) tool, which could be provided by SAP, like SAP Data Services or SAP Smart Data Integration, or from a third-party vendor. The concept behind these tools remains consistent. You start by defining the legacy database and the SAP HANA database containing the staging tables as data sources. Then, you establish mappings between them. Similar to the Migration Object Modeler, you can either directly copy values or apply transformations during the copy process.
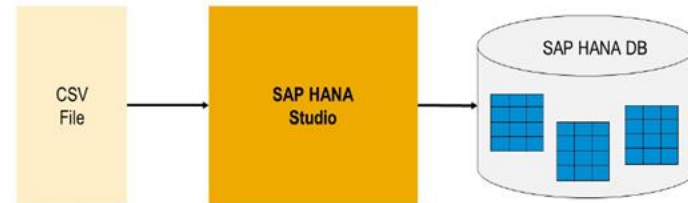
Instead of relying on complex ETL tools, you have a simpler option to populate the staging tables using CSV files. Here's how: Open the SAP HANA Studio and navigate to the SAP HANA Modeler perspective. From there, go to the Quick View and choose Import, followed by SAP HANA Content → Data from Local File. Here, you can specify the CSV file's name, its delimiter, and the target table where you want to insert the data. Once you proceed to the next step, the system presents the columns of both the CSV file and the staging table. You'll need to map the fields from the file to the corresponding fields in the table. Once you've completed the mapping, selecting Finish initiates the process of loading the data from the file into the table. This straightforward approach avoids the complexity of ETL tools, making data loading more accessible and user-friendly.

In the subsequent phase of the migration process, you'll focus on preparing the staging tables. During this preparation stage, the system can validate the data within these staging tables. If you've populated the staging tables using file templates, you can skip this validation step as the system automatically validates the data upon file upload. However, if you've populated the staging tables using ETL tools or custom SQL code, it's advisable to enable the consistency check. This ensures that the data in the staging tables aligns with the required standards and prevents potential issues during the migration process.
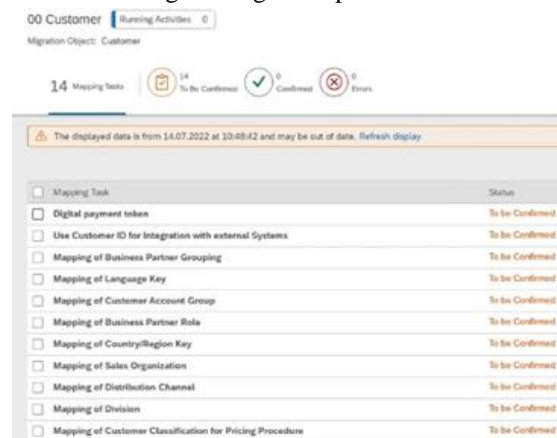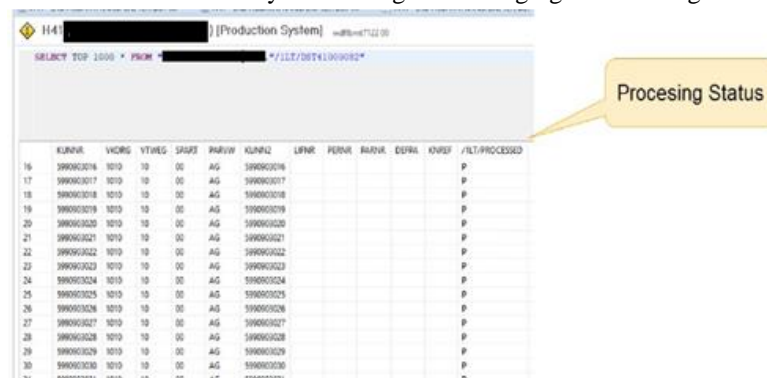

In this simulation, certain messages related to control parameters, are crucial values that guide the migration object in processing the migration effectively. These parameters, set during value mapping, are distinct from regular mapped values. For the customer migration to proceed accurately, the system needs to determine whether to utilize external or internal numbering, verify digital payment tokens, and enable integration with external systems. These control parameters ensure a smooth migration process aligned with specific requirements and system architecture.

To access the staging tables in the SAP HANA Studio and review both their definitions and contents, you'll need to log in to the SAP HANA database using a user account with the appropriate permissions to access the schema where the data is stored. In addition to the staging tables, there's an extra table named

/1LT/DS_MAPPING, which lists all the staging tables along with details such as the associated project, migration object, and source structure. Within each staging table, alongside the fields from the source structure, you'll find a field labeled /1LT/PROCESSED. This field indicates the current status of the data record, offering insight into the processing stage of each data entry within the staging tables. Understanding and accessing these tables and their fields is crucial for effectively monitoring and managing the data migration process.

5. Conclusion

In conclusion, the migration to SAP S/4HANA marks a pivotal shift for organizations aiming to modernize their ERP systems and embrace digital transformation. This white paper has explored the multifaceted journey of S/4HANA migration, covering essential topics from introduction to strategy and planning. Through detailed examination, we've explained various approaches available for SAP S/4HANA transformation, highlighting the significance of choosing between Greenfield, Brownfield, and Bluefield methodologies. Each approach offers distinct advantages and considerations, necessitating careful evaluation based on organizational needs and objectives. A significant aspect discussed is the utilization of staging tables for data migration, providing a structured approach to organize and validate data before its integration into the S/4HANA system. By leveraging staging tables, organizations can mitigate risks, streamline data migration processes, and enhance overall project efficiency.

Declarations

Ethics approval and consent to participate: Not Applicable

Consent for publication: All authors have consent to submit this paper to the Journal of Cloud Computing. Also, we confirm that this paper or any part of this paper was not submitted anywhere.

Availability of data and materials: Not Applicable

Competing interests: Not Applicable

Funding: Not Applicable

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