



Migrating to S4/ HANA on the public Cloud

After a slow start, the process of organisations migrating to SAP S4/HANA is gathering pace. Far more than just another SAP Enterprise Core Component (ECC) upgrade, moving to S4/HANA introduces a next generation ERP with the potential to transform your business. Migrating to this new environment takes careful planning and execution to minimise risk and ensure business continuity. The white paper the role a Cloud Service Provider (CSP) can play in smoothing your transition to SAP S4/HANA.

The question isn't if but when

In 2020, SAP announced that it was extending its support of the ECC environment until 2027(1). It did so not in recognition that some organisations were reticent to make the move to S4/HANA but through an understanding that the migration represents the biggest project that some IT departments will undertake. However, the direction of travel is clear and every organisation must transition at some point.

The migration to SAP S4/HANA is not technically difficult and can be done without upsetting your current ERP system. All you need is a solid migration strategy that ensures the new environment not only meets your business needs, but also transforms your business.

However, neither is the transition simple and risk-free. It requires a deep understanding of the business structure and technical impacts as well as updated skillsets and business strategies. All organisations need a clear business case as well as knowledge of the skills and resources that will be required for a successful transition. For many, this will mean selecting a partner with in-depth SAP and cloud experience and knowledge to partner through the migration and, perhaps, management of the new S4/HANA environment.

The benefits of SAP S4/HANA

In a recent survey of SAP users worldwide(2), 43% of respondents indicated that the end of mainstream maintenance for core SAP ERP releases drove migration to SAP S/4HANA. However, an almost identical number stated the opportunity to re-engineer processes to better fit operational needs as their key driver. S4/HANA is unlike previous SAP systems in that it is a foundation for digital transformation with the capability to move you to become a truly data-driven organisation.

SAP S/4HANA builds on the functionality of previous SAP systems but represents a major step forward. It dramatically simplifies data, improves your business processes and workflows, handles larger transaction and data volumes as well as introducing real-time analysis through in-memory technology. The ability to apply data to make decisions and simulate business scenarios in real time sets S4/HANA apart.

In addition, it lets you integrate disruptive digital technologies - such as the Internet of Things (IoT) and machine learning - to connect, collect and analyse data for these new devices and systems. All this is presented through the new rich SAP Fiori user interface with its personalized, intuitive user experience and over 10,000 apps extending capabilities across all lines of business, tasks, and workflows.

SAP S4/HANA adoption increasing - rapidly

According to SAPinsider(3), over 85% of companies had at least started to evaluate the migration to S4/HANA in 2020. While the number of organisations that had gone live doubled between 2019 and 2020, the number with no plans to migrate had more than halved. In fact, of those that had started planning their migration, over half stated their goal was to migrate at least 80% of their current ERP instances to SAP S4/HANA.

An interesting finding from this survey was the fact 38% of respondents who hadn't started their migration said that they struggled to see a clear path to integrating SAP's current product line and innovations with their current ERP(4). This chimes with research from SAP user groups in the US and Germany that placed complexity and a lack of the required skills at the top of the challenges to migration(5).

The result is that more businesses are turning to third party services providers to help with the migration. IDC found that 77% of organisations beginning their migration process say they will use a partner to 'digitally transform, plan out the integrations, business process mapping, change management and deployment'(6). Cloud Service Providers are becoming a natural choice.

4 reasons for moving SAP to the Cloud

Undoubtedly, SAP is a very important part of today's businesses and most user organisations are still primarily hosting their systems on-premise. Yet, as SAP moves its solution portfolio to the Cloud, businesses that remain with on-premise infrastructure risk getting left behind. There are four key areas that, today, should be driving a Cloud-first strategy for every company.

The maturing Cloud-based SAP roadmap

While the discontinuation of ECC maintenance support in 2027 seems to suggest a drop-dead date for migration if you're to avoid high costs for maintaining legacy, on-premise systems, it shouldn't be the primary motivation. SAP S4/HANA is now a very mature product. It now has a great deal of the functionality set out in SAP's initial vision integrated into the core product to include capabilities that are simply not available in other versions of SAP ERP systems.

Major Component Modernisation

In the past, SAP could be seen as a closed box with an integrated structure for managing internal functions. However, ERP is now also viewed as a foundation for innovation. We are moving away from the monolithic, central structures of the past to more distributed and agile structures that boost flexibility and performance while reducing risk and cost. Your ERP instances can't be a standalone solution but must integrate with other components in your enterprise IT architecture.

SAPinsider found that a significant portion of companies (41%) believed the opportunity to re-engineer business processes was a key driver of their SAP S/4HANA migration, and 62% designated integrations between the core ERP and Line of Business applications as very or extremely important(7).

With the increase in the speed of innovation, it has become very difficult to keep up with the new services and innovations offered by the public Cloud. It delivers the potential for cost reductions, efficiency increases and structural improvements. These structures provide businesses with great flexibility, cost advantage and mobility. The public Cloud becomes an attractive option when migrating to SAP S4/HANA as it facilitates the major component modernization that builds an agile and resilient digital business.

Smart ERP

More than 80% of the data in the ERP system remains locked there and is never made available for analysis. This means that the full value of the operational and financial data isn't realised. SAP S4/HANA with its in-memory technology allows for the real-time analysis of all data within the ERP system not just sample sub-sets. In this way, you can use this hidden data in the ERP for forward-looking predictions and proactive decision-making. This requires being able to capture and analysis data not just from the ERP systems but other internal and external systems. The public Cloud is perhaps the only solution with the compute power and hyperscale capabilities to support these types of smart ERP activities.

The Pandemic Factor

In the last year, the COVID-19 pandemic has changed the world in ways we couldn't have imagined and it's difficult to predict what will happen next. The rush to work from home and the need to digitally engage with customers and employees showed fault-lines in IT infrastructure that had been apparent for some time and has accelerated digital transformation in virtually every industry sector. Companies now need to focus on cost optimisation but most also offer be agile and flexible about how they respond to customer and demand signals. Legacy and on-premise systems can't deliver these capabilities over the long term. The Cloud has now become the foundation that digital business is built.

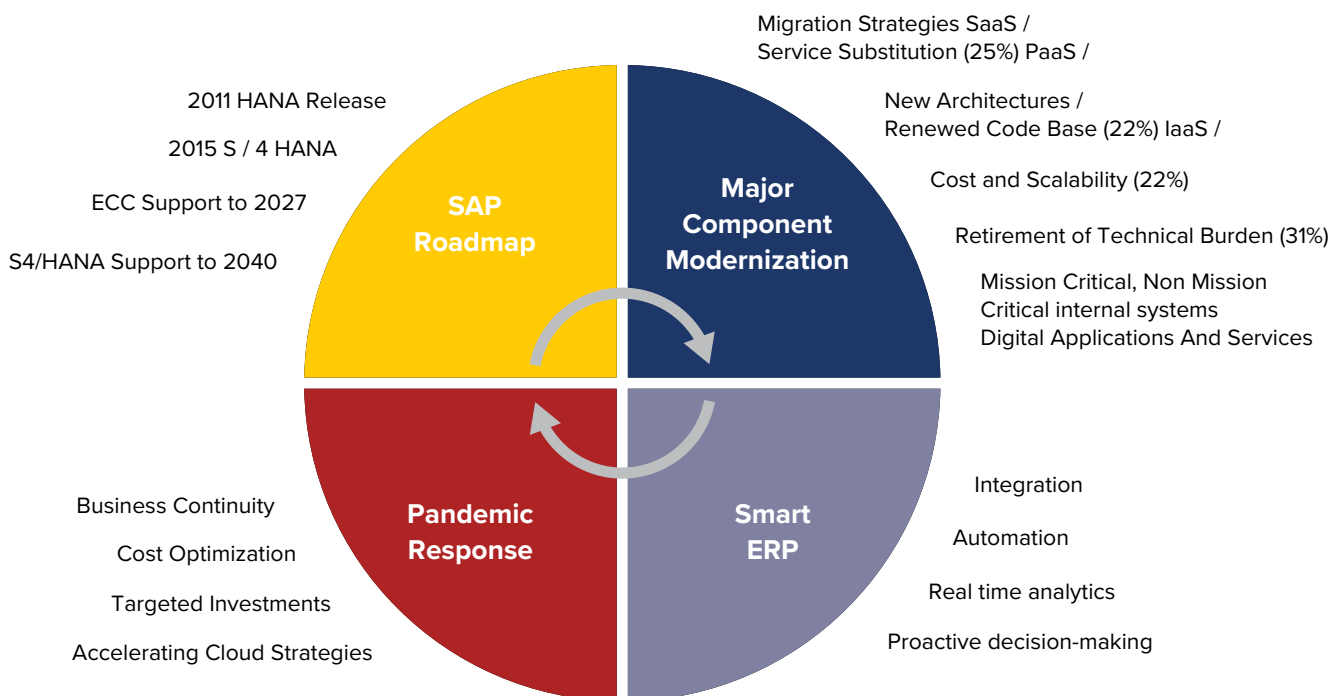


Figure: 1: 4 reasons for moving SAP to the Cloud

The functionality of public Cloud is proving attractive to many organisations as they begin the transition to SAP S4/HANA. In fact, recent research showed that while 30% of respondents preferred SAP HANA Enterprise Cloud, 39% of organisations stated that they were selecting hyperscale Cloud environments. When hybrid Cloud installation were taken into account, public Cloud adoption reached 52%(8).

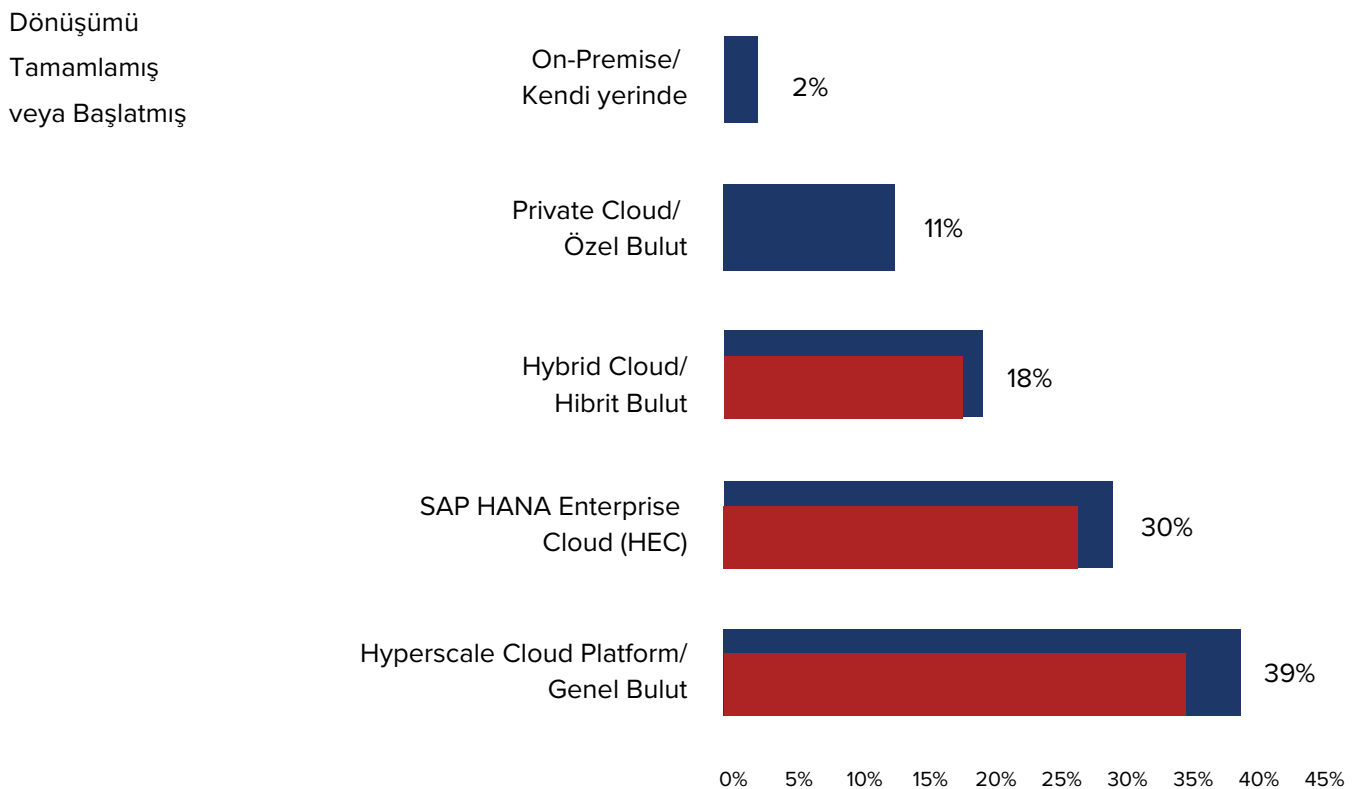


Figure 2: Public Cloud the most popular choice

Selecting your migration model

There is no single model for SAP S/4HANA migration, and every organization is in a different stage of SAP S/4HANA readiness. SAP has identified three main models: Greenfield, Brownfield and Landscape Transformation. Each model has its advantages and challenges so you have to take a look at the databases, platforms, and configurations required before deciding on the method that most suits your business requirements.

Greenfield

The Greenfield approach involves migrating from a non-SAP legacy system or SAP ERP system to an entirely new implementation of SAP S/4HANA. This has advantages in that it enables you to redesign business processes, clean data and develop new data models, and take advantage of all the new features and apps available in S/4HANA. However, in most cases it will require abandoning years of investment and customization made to suit your business needs. It can be time-consuming and costly as master and transactional data are migrated from the legacy system, meaning standard data migration tools and content have to be used. Research from IDC suggests less than a quarter of organisations favour this approach(9).

Brownfield

The Brownfield model consists of a complete conversion of an existing SAP ECC and Business Suite systems to SAP S/4HANA – often called ‘lift and shift’. In this approach, you move the whole system and business process to the new environment. Although this allows for some change and re-engineering, it’s attractive for companies

that want little alteration to their current operations and business process. It allows you to run your business with minimal disruption or risk as this is primarily a technical system conversion. You may need to use the SAP Software Update Manager (SUM) with Database Migration Option (DMO) in case SAP HANA is not currently your underlying database. The downside is that you will not be taking full advantage of the potential of S/4HANA to transform into a data-driven business. With massive investments to protect, this is the most popular choice for SAP users(10).

Landscape Transformation

In this model, organisations select the parts of their current SAP systems that they wish to migrate to SAP S/4HANA. This means identifying and migrating the process that gives you the best—and fastest—return on investment (ROI) from the migration. As well as letting you select the areas of your current ERP systems to move, the benefit of this approach is it allows you to consolidate your current system landscape onto a global SAP S/4HANA system. IDC has found that 43% of organisations are looking to consolidate several ERP instances as part of their migration process(11).

Starting with a brand-new SAP S/4HANA system, using the Greenfield approach, sounds appealing and may suit some businesses. According to a SAPInsider report(12), the majority of early adopters preferred the Greenfield approach. However, with vast amounts of custom code, system modifications and integrations, most organisations want to maximize existing ERP investments and minimize disruption during transition. SAPInsider found most organizations prefer the Brownfield model, also known as an SAP S/4HANA System Conversion.

Things to consider when migrating to S/4HANA

Custom code

Every ERP system is unique and includes a good deal of custom codes built up over the years so, when migrating to SAP S/4HANA, custom codes have to be carefully migrated. They can be migrated progressively during the overall migration process. SAP S/4HANA has many tools to adjust and revise custom code and Z-Codes to facilitate the transition during your SAP S/4HANA implementation.

Business process reengineering

SAP research found that a significant portion of respondents chose the opportunity to re-engineer business processes as a key driver of their SAP S/4HANA migration(13). Business processes evolve over time to a point where they are often ineffective – or irrelevant – for the today's business. In addition, current business processes and workflows may be incompatible with the capabilities within SAP S/4HANA. The migration process gives the potential to address and improve the business processes you migrate to SAP S/4HANA.

Application integration

SAP research demonstrates that 62% of organisations see integrations between the core ERP and LoB applications as very or extremely important(14). A major benefit of S/4HANA is its support for and open and

diverse landscape of SAP and third party business applications. While SAP provides native integration for S4/HANA with other SAP systems and some third party systems, it's highly likely that more complex API-driven integration and data transformation will be required to fully migrate existing integrations and establish new ones.

Data cleanliness and quality

Many organisations place data cleansing, deleting and archiving at the top of their priority list as part of their migration strategy(15). They look to improve the quality of the data being migrated while minimising the footprint of the new SAP HANA footprint. As there are many data and table changes involved in an S4/HANA conversion beginning with data cleansing and retirement – where possible – will improve the quality and performance on the new environment.

Why AWS is the ideal chose for public Cloud

Whether Greenfield, Brownfield or Landscape Transformation, selecting the correct public Cloud strategy is essential to drive successful migration. Amazon Web Services (AWS) is becoming the choice for many enterprises worldwide. It offers a range of benefits when hosting your SAP S4.HANA environment, including:

Digital transformation

In order to achieve digital transformation, you need a Cloud environment that allows you to perform this transition effectively. AWS enables you to host S/4 HANA on SAP-certified machines on AWS, and use them with full efficiency while providing a smooth transition to a fully Cloud-based environment as your migration strategy (see blow) or business need dictates.

Flexible pricing

AWS provide 'pay as you go' pricing model for Cloud hosting allows you to quickly benefit from economies of scale by scaling up or down as your business requires. You are able to reach the capacity you need without wasting resources. Not only can this reduce costs, it will free investment in other areas of your SAP S4/HANA program.

Business agility

As of 2020, AWS now offers more than 175 services (16) including services for compute, storage, database, analytics, management tools, IoT and enterprise applications. You have the capabilities to quickly and easily optimize your SAP S4/HANA environment while extending connectivity and capabilities. New services can be brought online within days to boost your agility and innovation through access to new technologies within the Cloud environment.

Business continuity

AWS offers a wide range of business continuity features to ensure access and availability of your business critical systems at all times. Chief amongst these are the 77 Availability Zones and global infrastructure in 24 different regions of the world. AWS not only provides high availability services, but also helps you maintain system access at the desired SLA levels while reducing your costs.

Real-time analytics

In addition to the new analytics features of SAP S4/HANA, AWS provides capabilities to enhance, organize and analyze data in AWS in an integrated environment including S4/HABA and other enterprise applications.

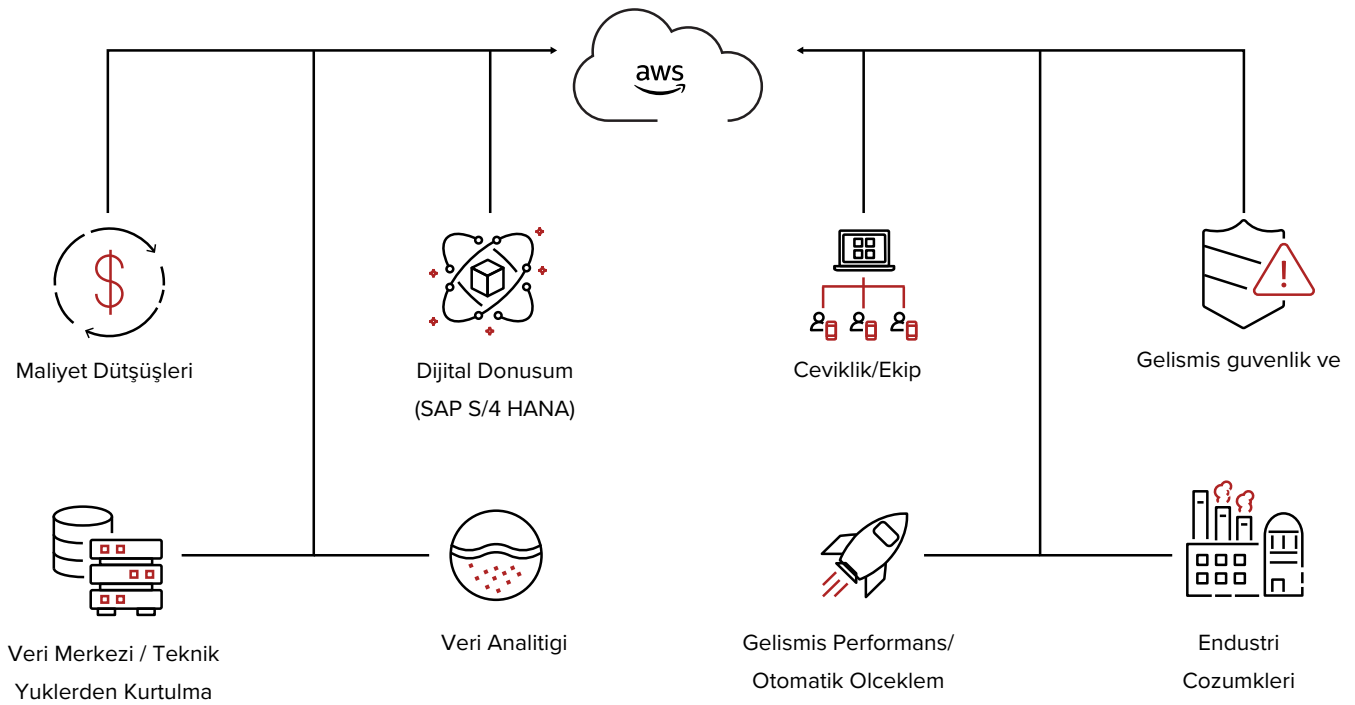


Figure: 3: Capabilities of AWS

Source: AWS

In short, AWS is enabling businesses to realizing all the benefits of placing their SAP workloads in public cloud and make the transition to SAP S4/HANA.

SAP transport and migration strategies on AWS

Today, there are six common transportation strategies – known as the 6 ‘R’s (See table 1). When dealing with Cloud environments, the first four R’s are important, while the first two are also most relevant for the transportation strategy in SAP environments. However, it’s important to note that factor such as cost, transportation skills, time, and skills availability are also major consider that affect the transportation journey.

Looking at in a little more depth at the first four R's:

Re-Host

The Re-Hosting strategy involves moving any on-premise server to the Cloud “as-is” with little or no modification. You can think of this as the “lift-and-shift” method. The advantage of this approach is that you’re moving your on-premise capabilities to the same or better environment on AWS while reducing the cost and resource needed to manage or maintain it.

Re-Platform

The Re-Platform strategy is suitable for aiming to move a non-HANA data warehouse to a HANA data warehouse, either on-premise or on SAP S4/HANA.

Re-Purchase

The Re-Purchasing method is the easiest method when transitioning to public Cloud. It enables you to migrate the basic SAP workload from your on-premise quickly by adapting it to its equivalent in AWS. This accelerates the migration process and makes it easier to begin using the workload in the Cloud.

Re-Factor/Re-Architect

This strategy that will provide you the most added value from your SAP S4/HANA migration. However, it can be a complex and time-consuming process that has to be constantly updated. The benefit is that, with this strategy, you reshape the architecture of your current environment according to the cloud and move it to AWS, so the new environment is customized to your business needs.

Table 1: The 6 R's

“R” Migration Strategy	Methodology
Re-Hosting	The application is migrated as is to Cloud. This is called a “lift-and-shift” approach.
Re-Platforming	The application is changed or transformed in some respect as part of its migration to Cloud.
Re-Purchasing	You move to a different application or solution on the Cloud.
Re-Factoring / Re-Architecting	The application is redesigned (for example it is converted from a monolithic architecture to microservices) as part of the migration to Cloud.
Retiring	The application is retired, and usually replaced (with an application or SaaS service) during migration to AWS.
Retaining	The application is stayed put and not migrated.

Deciding on the Transport Strategy

The next question becomes which transportation strategy to select for your organisation. When choosing the transportation strategy, you need to consider some issues in both your business operations and the AWS delivery side.

We can divide the operational issues into four: project, infrastructure, transportation, and optimization. After gaining a full understanding of these issues, they must be applied properly to the delivery side. So, you then need to determine whether you will make a “lift-and-shift” with the Re-Hosting strategy for the delivery side or a “lift, tinker & shift” with the Re-Platform strategy (See Figure 4).

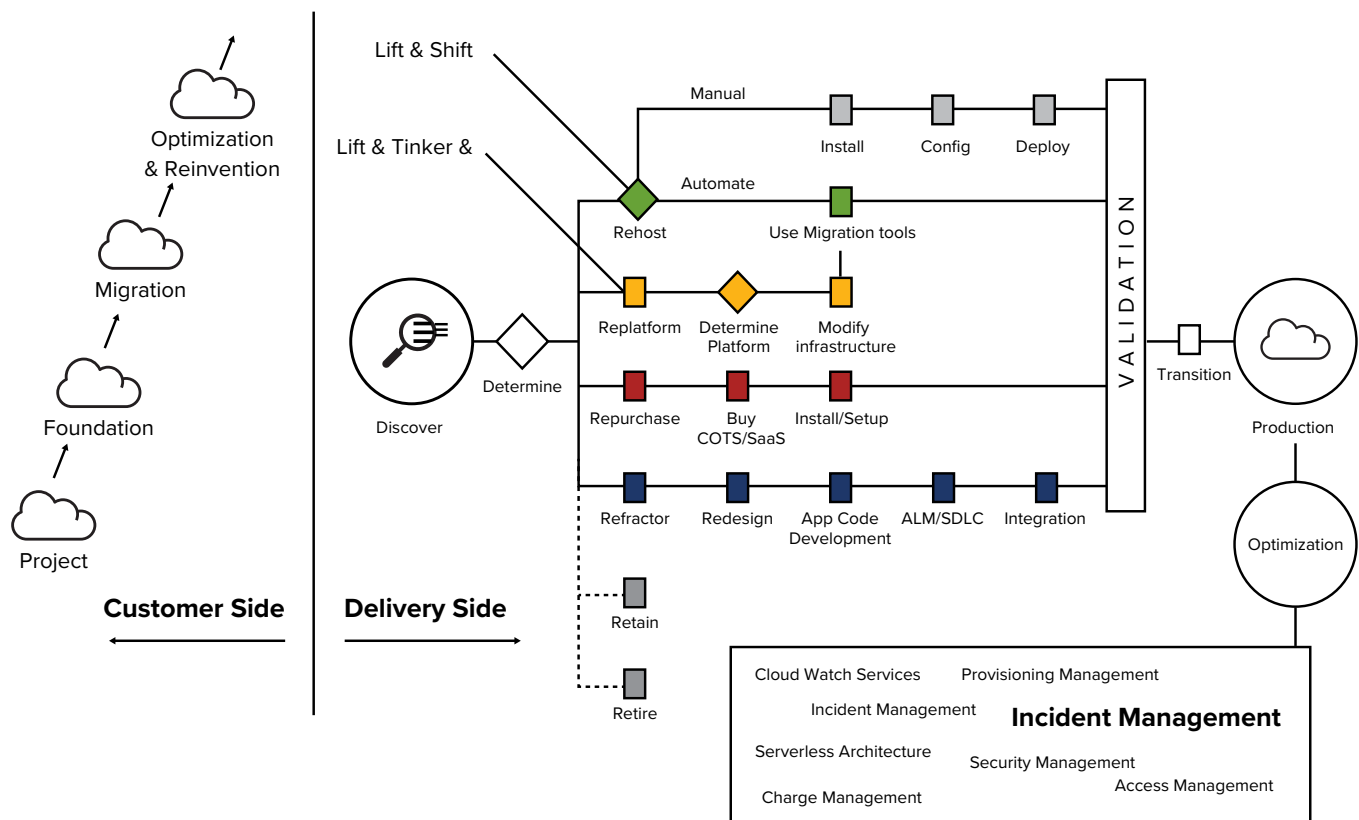


Figure: 4: Different transportation strategies

Transport tools and methodologies

There are certain tools and methodologies that can assist you in your journey to move your SAP workloads to the Cloud. These include:

SAP HANA Classical Migration

SAP offers the SAP HANA classical migration option for migrating from other database systems to SAP HANA. In the preparation phase, your SAP workload is converted to unicode with the “Split dual-stack” operation. Next, the upgrade phase involves all planning and performance maintenance for the new S4/HANA environment. Finally, all the on-premise data is moved to SAP S4/HANA during the transport phase.

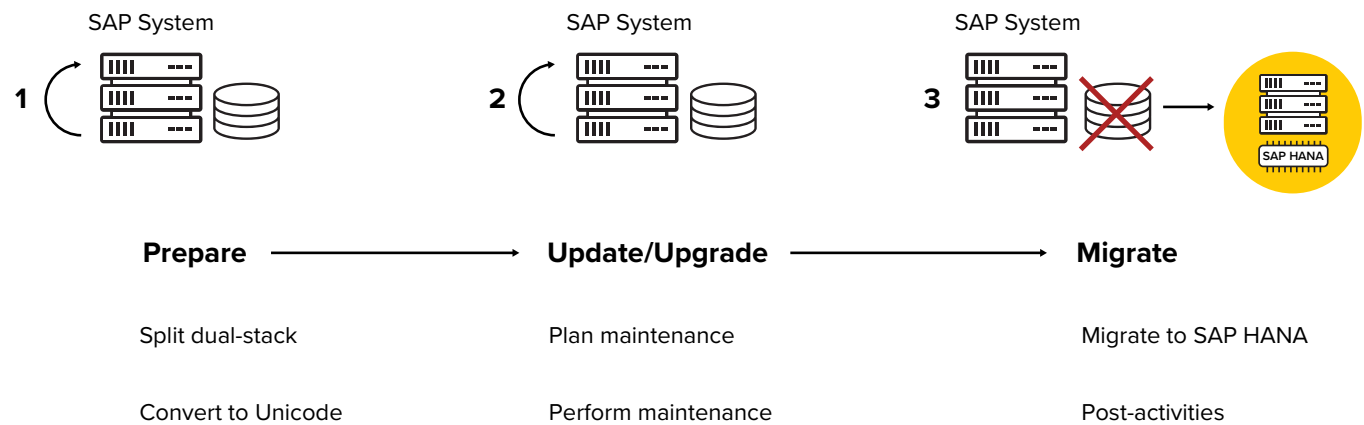


Figure 5: SAP HANA Classical Migration

SAP Software SUM DMO

SAP offers the standard SUM DMO approach as a one-step migration option from other database systems to SAP S4/HANA. In this approach, you can do the same operations we do in the SAP HANA Classical Migration strategy “on the fly”, that is, while performing the migration process. It uses SAP DMO process and tool to automate multiple required migration steps. This is a preferred option if you are already running SAP on anyDB on AWS, as it will improve your migration times to SAP HANA.

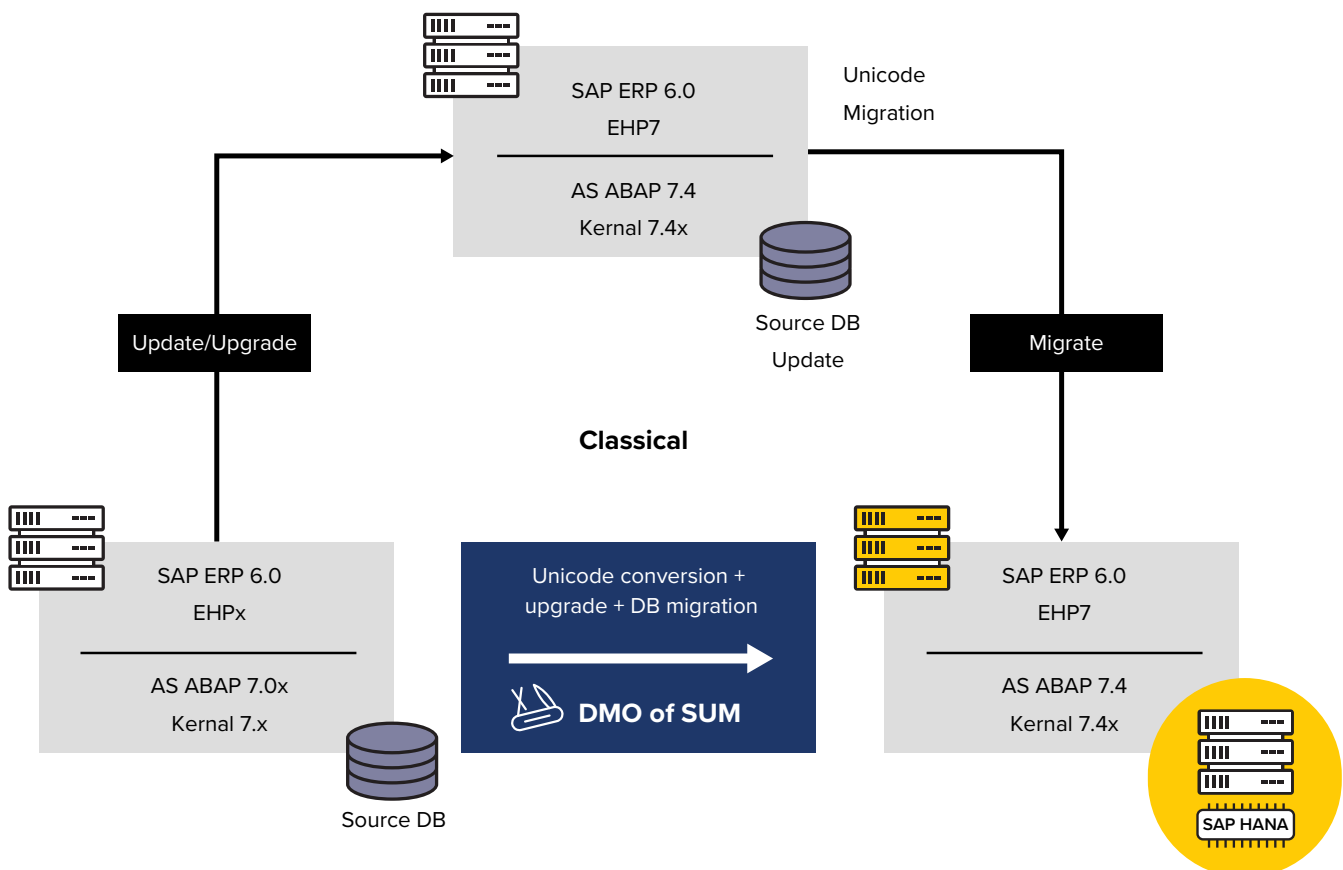


Figure 6: SAP Software SUM DMO

SAP HANA HSR

With SAP HANA HSR, you can move the data warehouse to a secondary data warehouse or another location using the SAP HANA System Replication (HSR) tool. Although the secondary data warehouse is identical to the primary data warehouse, it can be used as a primary data warehouse.

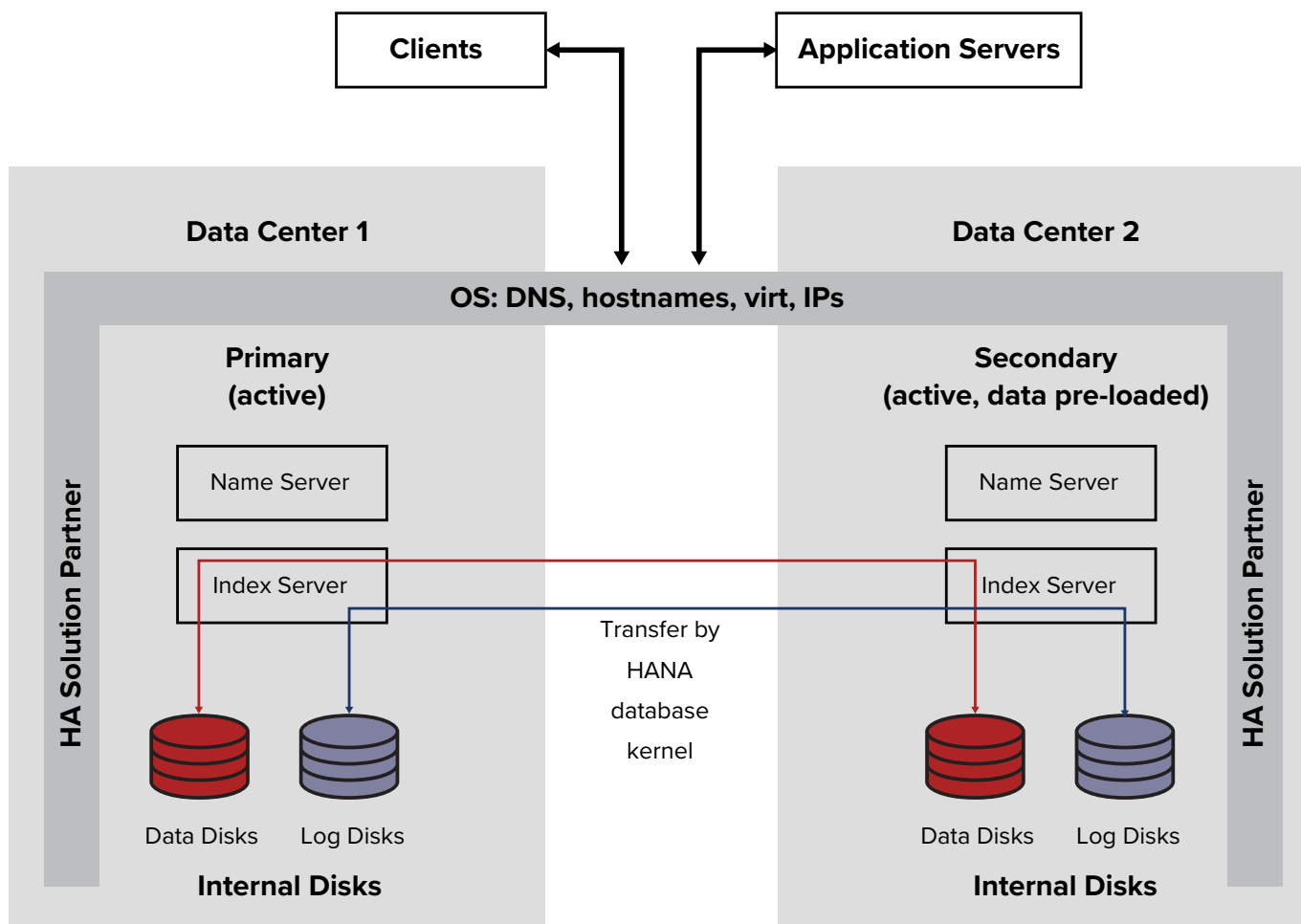


Figure 7: SAP HANA HSR

SAP HANA HSR with Initialization via Backup and Restore

With this method, there are backup and recovery options in response to any bandwidth problem in addition to the processes in HSR. In addition it allows you to replicate data without consuming bandwidth needed for your current network traffic.

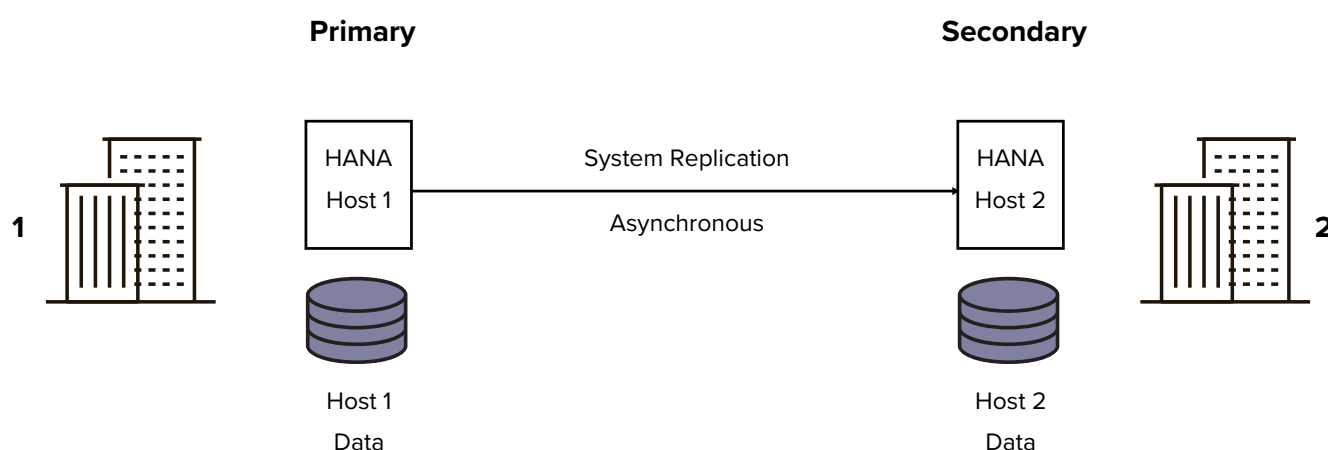


Figure 8: SAP HANA HSR with initialization via Backup and Restore

SAP S4/HANA migration scenarios

There are a number of SAP S4/HANA migration scenarios that are available to you (See table 2). For example, when you want to move a non-SAP data warehouse in any environment to the SAP S4/HANA data warehouse in AWS, one of two transport methods can be used: SAP HANA Classical Migration or SAP Software SUM DMO.

In the scenario where you want to move an SAP data warehouse in any environment to SAP in AWS, the available methods are SAP HANA Classical Migration, SAP HANA HSR and SAP HANA HSR with Initialization via Backup and Restore.

Finally, in the scenario where you want to move a SAP HANA in EC2 in AWS to a high memory EC2, SAP HANA HSR with Initialization via Backup and Restore, SAP HANA HSR. In addition, EC2 instance resize and AMI can be used.

Table 2: SAP S4/HANA migration options

Migration scenario	Source database	Target database	Migration tool or methodology
Migration of anyDB from other platforms to AWS*	anyDB (any non-SAP HANA database such as IBM DB2, Oracle Database, or SQL Server)	SAP HANA	[✓] SAP HANA classical migration [✓] SAP DMO with System Move
Migration of SAP HANA from other platforms to AWS*	SAP HANA (scale-up and scale-out considerations apply here as well)	SAP HANA	[✓] SAP HANA backup and restore [✓] SAP HANA classical migration (considered a homogeneous system copy in this scenario)** [✓] SAP HANA HSR [✓] SAP HANA HSR with initialization via backup and restore
Migration of SAP HANA from an existing EC2 instance to an EC2 High Memory instance	SAP HANA	SAP HANA	[✓] Instance resize [✓] Amazon Machine Image (AMI) [✓] SAP HANA backup and restore [✓] SAP HANA HSR

RPO / RTO - Risk vs Cost - Finding Your Optimum Level

One of the most important issues in moving your SAP S/4 HANA to the cloud is to find the most suitable environment for your business, ie the optimum environment. There are to measures you should apply to reach the optimum for your business these are:

Recovery Time Objective (RTO)

The RTO is the maximum acceptable delay between service interruption and service reinstallation.

Recovery Point Objective (RPO)

The RPO is defined by the organization. It is the maximum acceptable time since the last data recovery point. This determines what is considered an acceptable data loss between the last recovery point and the downtime. If you want the recovery to occur within seconds, the risk of data loss is very low, but the cost is also higher.

Likewise, if you want high availability for your environment, this reduces the downtime of your system but also increases the cost.

In essence, by creating the ideal balance between RTO and RPO you can determine the optimum level for your specific business requirements (See figure 9).

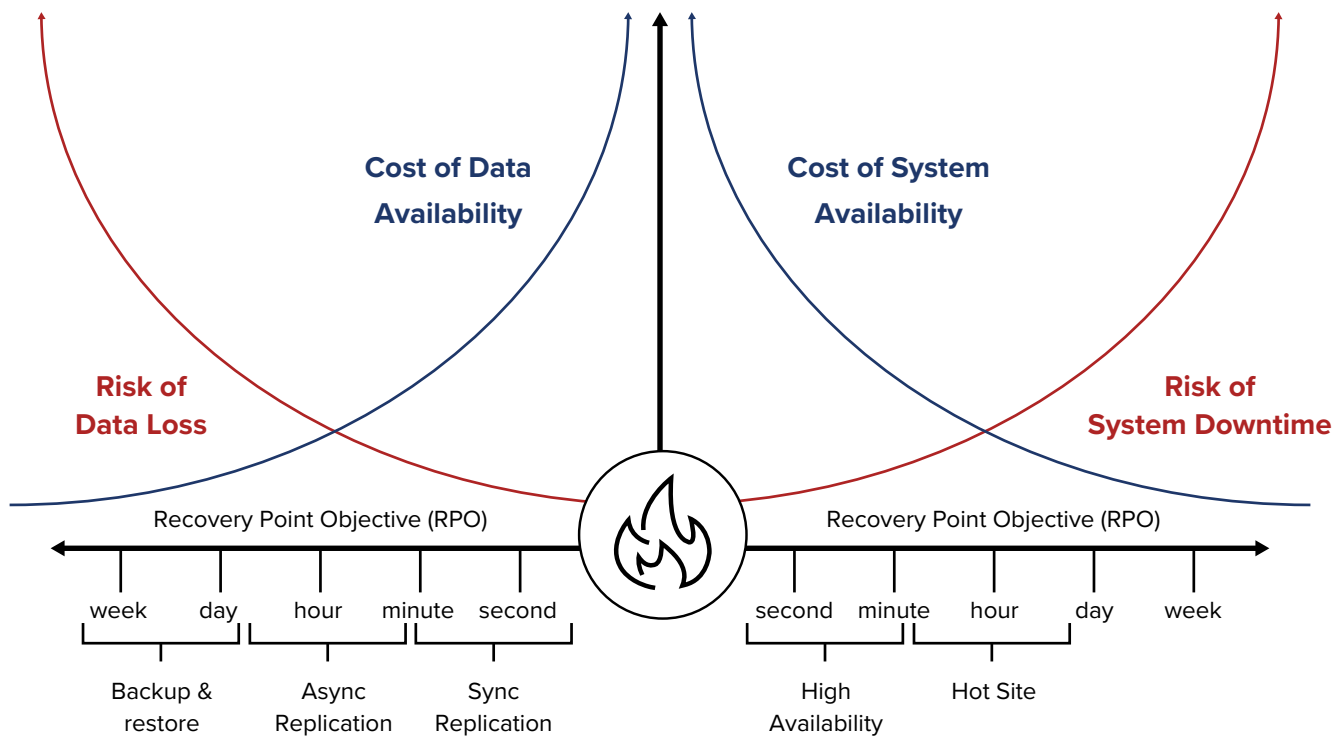


Figure 9: RTO and RPO

The advantages of working with a Cloud Service Provider

The cost and complexity of any SAP S4/HANA migration program is making most organisation consider partnering with an CSP to ease the process. It also provides access to a skills base – in both SAP and the Cloud – that is usually missing internally and recruitment for these skills is increasingly costly and difficult.

Recent research showed 80% of companies still to complete their Cloud migration had postponed or cancelled their migration of SAP applications to the public cloud due to a shortage of SAP skills(17). In addition, another 74% of organisations said they have taken a similar decision due to a lack of public cloud skills.

Beyond, the flexible access to skills and resource, a recent paper from the Society In its 2021 report the Society for Innovation, Technology and Modernisation (Socitm)(18) outlined four areas where working with a CSR delivers significant benefit:

Business benefits

- Easy and flexible access to skills and resource Interface and access, ease of use
- Business continuity and resilience built into the service
- Governance and reporting integrated into the service

- Business agility and innovation

Finance benefits

- Costs based on capacity and usage
- Predictable and transparent billing
- Value for money through current and future benchmarks
- Reduction in hidden costs and future cost protection

Technology benefits

- SAP, Cloud and wider application and infrastructure experience and skills
- Support including transition capacity and skills transfer
- Access to latest versions of all technologies
- Elimination of technical debt and legacy maintenance

Data benefits

- Compliance, data protection and GDPR compliance
- Data recovery planning and high availability services
- Highest levels of security and access management
- Data policies designed for Cloud environments

Why Runibex Technology?

Runibex Technology is a Cloud Service Provider that also specialises in delivering services and consultancy to SAP users worldwide. With more than 20 years of SAP experience, our consultancy and management services optimise the performance and cost of any SAP installation. As you look to the power, flexibility and scalability of the Cloud to get more from your SAP investments, you have SAP service providers that can smoothly migrate and effectively manage your journey to SAP S4/HANA.



About Runibex Technology

Runibex Technology Limited is a wholly owned subsidiary of the Runibex Technology Group (RTG). Founded in Turkey in 1988, RTG is active in four core businesses: Cloud-based Managed Services, e-commerce, SAP consulting, cloud-based business analytics and intelligence.

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