



AWS FOR MIGRATION

# Migrating SAP to the cloud

How to transform your enterprise backbone into a competitive advantage

# Table of Contents

|  |    |
|--|----|
| Introduction: Powering SAP workloads with the cloud .....          | 3  |
| Answering common questions about SAP in the cloud .....            | 5  |
| Why migrate critical SAP workloads? .....                          | 9  |
| Choose AWS to run SAP.....   | 11 |
| Understanding the benefits of four different migration paths ..... | 13 |
| Resources to get started .....                                     | 19 |

## INTRODUCTION

# Powering SAP workloads with the cloud

The cloud has emerged as the de facto standard for running and modernizing SAP workloads. Join thousands of customers benefiting from AWS and Intel's infrastructure leadership, to underpin your mission-critical SAP workloads. Flexibly switch between our wide selection of cloud-native, Intel Xeon-based instances to continually optimize costs, while delivering exceptional performance, reliability and scalability. Industry leaders like BP, Bristol-Myers Squibb, ENGIE, and Liberty Mutual run SAP in the cloud to innovate faster, improve reliability and security, get more value from their data, and reduce costs.

In 2017, Moderna Therapeutics moved its SAP environment to the cloud to take advantage of these benefits and more. The company constructed a 200,000-square-foot facility to produce clinical-grade mRNA therapeutics and vaccines. The cornerstone of the facility's IT ecosystem was SAP S/4HANA, which uses cloud services to connect with manufacturing instruments, robotics, and other integral systems. By combining the power of SAP S/4HANA with the flexibility and speed of the cloud, Moderna achieved uncommon results. The company compressed preclinical drug development, reduced costs, and increased the agility of its research, development, and manufacturing processes. Above all, Moderna accomplished breakthroughs—such as the rapid development and testing of its COVID-19 vaccine—that may have been impossible even a few years ago.<sup>1</sup>

“Our scientists can have an idea for a unique protein, order it online that day, and be running preclinical experiments on it in less than a month,” said Marcello Damiani, chief digital and operational excellence officer at Moderna. “In traditional pharmaceutical research and development, it would take years.”

Intel and AWS have collaborated to create very large, cloud-native EC2 instances, purpose-built for in-memory workloads such as SAP, based on Intel® Xeon® Scalable processors. AWS’s large instances powered by Intel® Xeon® Scalable processors support some of the world’s biggest and most mission-critical SAP implementations. Most recently, the US Navy and SAP National Security Services (SAP NS2) migrated their largest SAP enterprise resource planning (ERP) system—72,000 users spread across six US Navy commands—to the cloud.

The milestone—which came 10 months ahead of schedule—will put the movement and documentation of some \$70 billion worth of parts and goods into one accessible space so the information can be shared, analyzed, and protected more uniformly. Bringing the system into the cloud increases visibility and availability of data so the Navy can make timely and informed decisions around its financial reporting and budgets and maintenance and repair logs, and conduct advanced analytics.<sup>2</sup>

These are just two examples of the many large-scale organizations that rely on the cloud to get more value from their mission-critical SAP implementations.

By reading this eBook, you’ll further understand why you should be thinking about migrating your SAP workloads to the cloud today. It includes insights, advice, and real-world examples from other organizations’ SAP cloud journeys, considerations for migrating successfully, and how the cloud can help you innovate, modernize, and transform your business processes running in SAP to drive your competitive differentiation. Learn how you can benefit from the 10+ years of collaborative innovation between AWS and Intel to optimize the cost of running your SAP workloads, while meeting your performance, scalability and reliability requirements.



# Answering common questions about SAP in the cloud

As you consider SAP migration, you're likely to have questions about the cloud and how it will handle your unique needs. In this section, we'll answer a few common questions about the cloud and SAP and look at some specific examples of how organizations have addressed them.



## QUESTION

# Can you run mission-critical, large-scale production SAP systems in the cloud?

## ANSWER

**The cloud allows most organizations—even those with large production environments—to achieve higher reliability and performance for SAP workloads. AWS's large instances powered by Intel® Xeon® Scalable processors support some of the world's biggest and most mission-critical SAP implementations.**

For example, Siemens Smart Infrastructure is forecasting significant cost savings over the next four years after moving its SAP infrastructure to AWS during 2021. This involves 20+ HANA-based ERP and supply chain management systems that support business-critical processes. These will use a variety of EC2 instances, including X1 and X1e, utilizing Intel® Xeon® processor.<sup>3</sup>

NBCUniversal recently re-platformed its SAP environment—including more than 96,000 global user accounts, an 80+ terabyte database, and 163,000 custom objects—to the cloud. This led to a 40 percent average reduction in user response time, a job processing time trend improvement of 65–94 percent, and a 23 percent reduction in long-term TCO.<sup>4</sup>

And by moving its SAP environment to the cloud, the European division of global food manufacturing giant Kellogg's experienced dramatic performance improvements. Overall, the company achieved an average batch job execution improvement of 45 percent, with some jobs completing 90 percent faster than before.<sup>5</sup>

## QUESTION

# How can we accelerate our SAP migration and minimize business disruption?

## ANSWER

### **Using proven tools, cloud providers, and consulting partners allows you to migrate faster and more predictably.**

Migration tools from SAP, cloud providers, and consulting partners can help you quickly and securely move data and applications to the cloud. For example, Zappos upgraded its entire SAP landscape to SAP HANA and moved it to the cloud—all within 48 hours.<sup>6</sup> The US Navy also migrated its largest SAP ERP system—which supports 72,000 users spread across six US Navy commands—to the cloud 10 months ahead of schedule.

Furthermore, by working with consulting partners that have demonstrated they are experts in both SAP and cloud migration, you can migrate more efficiently, benefit from cloud architectures based on proven best practices, and build an efficient cloud operating model for SAP.

## QUESTION

# How does the cloud address the security and compliance requirements of our SAP workloads?

## ANSWER

### **Provider controls, native and third-party tools, and automation help improve your security posture and simplify compliance in the cloud.**

By moving to the cloud, you can inherit the compliance controls of the cloud provider. Cloud providers use redundant and layered controls, continuous validation and testing, and a substantial amount of automation to enable the underlying infrastructure to be monitored and protected 24/7.

AWS, for example, supports a wide range of security standards and compliance certifications, including FedRAMP, FIPS 140-2, GDPR, HIPAA/HITECH, NIST 800-171, and PCI DSS.

To further strengthen your security posture, you can leverage a wide variety of native and third-party tools and features. Native-cloud security controls strengthen your own compliance and certification programs, while also providing access to tools you can use to reduce your cost and time to run your own specific security assurance requirements.

One example is Seaco, the world's largest sea-container leasing company. It uses cloud-native services to virtually isolate and granularly control access to resources, monitor its network more closely, and deliver virtual desktops securely.<sup>7</sup>

The cloud can also enable you to streamline and automate compliance and reporting. Bristol Myers Squibb, for example, uses cloud-native services to create a consistent, scalable, and repeatable compliance process for GxP and other key regulatory requirements. This automates many compliance tasks and allows the company to focus on its broader SAP transformation.<sup>8</sup>



# Why migrate critical SAP workloads?

## Advantages to powering SAP with cloud resources

The cloud enables a multitude of benefits that can help you modernize your SAP environment and run it more efficiently. Migrating your SAP workloads to the cloud allows you to retire technical debt, save money, accelerate digital transformation, and gain greater business agility.

### Retire technical debt

Businesses often avoid large-scale technology upgrades, such as cloud migration of their SAP environments, in favor of applying quicker fixes to prior technology investments. In the short term, this is convenient for technical decision makers and practitioners alike, but it also means preserving antiquated tools and processes that hinder the operational effectiveness and agility of your SAP workloads. And the longer these tools and processes are embraced, the harder they are to move on from. In the long term, this trade-off is costlier than the short-term convenience is worth. By opting for cloud migration of your SAP workloads, you can eliminate technical debt, positioning your organization to improve operational efficiency and realize a faster pace of innovation for years to come.

### Save money versus on premises

By nature, SAP workloads tend to have volatile demand—monthly, quarterly, and annual reports create temporary peaks followed by extended valleys. On-premises, you're required to pay upfront for IT resources to support these peaks while watching these investments go largely unused during non-peak times. Adding to these costs are hardware refreshes, which require huge expenses every 3–5 years to keep systems up to date.

*“We needed to update our platform while at the same time developing a new analytics solution and new business model. Moreover, each local ERP system needed to connect to S/4HANA for development. During the short development timeframe, we needed to scale substantially—which made AWS a compelling option for us.”*

Thierry Langer, Finance Division CIO, ENGIE

*“To date, we’ve achieved a 52 percent reduction in our total cost of ownership due to using the AWS Cloud and plan to continue migrating critical applications to AWS...”*

Ben Cabanas, former Chief Enterprise and Security Architect, GE Transportation

By running SAP in the cloud, you can solve both problems. Cloud computing provides on-demand resources, which allow you to provision only what you need when you need it (and deprovision these resources when they're not needed). As a result, you pay only for the IT resources you use.

Since the peaks of SAP workloads are quite predictable, you can also provision reserved compute instances, which can save you up to 75 percent, depending on the cloud provider.<sup>9</sup> Cloud providers handle all hardware maintenance and refresh costs, meaning recurring capital investments in hardware are a thing of the past.

## Accelerate digital transformation

In the cloud, it is simple and cost-effective to combine modern technologies like the Internet of Things (IoT) and machine learning (ML) with SAP software to modernize and transform business processes that run in SAP. On premises, this initiative presents numerous challenges: Upfront costs can be massive, and it can take months or even years to plan and implement—let alone drive value.

Part of the beauty of running SAP in the cloud is that leading cloud providers continually update their services with the latest technology offerings. Because they are available natively, integrating these services with your SAP workloads can be done more quickly, cost-effectively, and with significantly less risk compared to on-premises deployments. This makes it easier for your organization to innovate and continually drive new value from your SAP landscape.

## Gain business agility

A recent McKinsey study showed that companies that invest in modernizing for agility can improve their financial performance by 20–30 percent.<sup>10</sup> While speed is critical to businesses of all sizes at every stage of their evolution, the importance of speed and the specifics surrounding its requirements can dramatically change throughout the business lifecycle. To deliver against these changing needs, your organization must be able to adapt quickly—and your SAP workloads must respond in kind, continuing to deliver fast performance as demands scale.

Moving your SAP workloads to the cloud provides you with the agility and scalability you need to achieve reliable performance throughout your business lifecycle.

*“We have increased the value of our SAP systems by integrating SAP with AWS technologies because we can steer the business in near real time.”*

Yuriy Volosenko, former Director of Enterprise Applications and Architectures, Zalando



# Choose AWS to run SAP

AWS is the platform of choice and innovation for 5,000+ SAP customers and hundreds of partners.

## Unmatched experience and industry leadership

Safeguard your migration and transformation success by running in the cloud that SAP has trusted since 2008 and that 5,000+ active SAP customers trust today. There's no comparison algorithm for experience, and when you come to AWS, you benefit from all our learnings helping far more SAP customers migrate to and modernize in the cloud than any other provider. Over this 13+ year journey, AWS has had a consistent track record of industry firsts for SAP in the cloud. Today, SAP uses AWS to power many of its most popular cloud solutions, including Qualtrics, RISE with SAP, SAP Business Technology Platform, SAP Concur, and more.

## Customer choice and flexibility

AWS provides the most choice and proven approaches to SAP in the cloud success. Whether you're looking to lift and shift ECC, migrate to S/4HANA, or innovate and transform with AWS services, we can help you get more value out of your SAP investments. Our consistent, cloud-native architecture across all instances and services gives you the most flexibility to design for your unique business requirements and seamlessly adapt as they change.

*“BP needs the agility to be competitive when prices, policy, technology, and customer preferences are changing, and that’s what we get with AWS.”*

Steve Fortune, CIO, BP

## Proven cost savings

Break the expensive and complex hardware refresh cycle with the last infrastructure upgrade you will ever have to make. Then, continuously benefit from our constant improvements to the [AWS Global Infrastructure](#) without making new capital investments. AWS customers save an average of 31 percent on IT infrastructure,<sup>11</sup> and a 2021 Forrester Report commissioned by AWS found that composite customers that bring SAP ECC to AWS experience a 103 percent ROI after three years.<sup>12</sup>

## World’s broadest set of cloud services

Drive innovation, modernize your infrastructure, and transform your business by combining your SAP investments with 200+ AWS services, including analytics, IoT, artificial intelligence (AI), machine learning, and more. AWS provides significantly more services—and more features within those services—than any other cloud provider. AWS also has the most comprehensive set of cloud-native partner offerings purpose-built for SAP customers.

## Comprehensive, industry-leading security and compliance

Strengthen your security posture with comprehensive, industry-leading security and compliance controls. When you run on AWS, you get the control and confidence needed to securely run your SAP systems with the most secure cloud computing environment available anywhere.



# Understanding the benefits of four different SAP migration paths

There are many paths to pairing SAP with the cloud, and organizations will discover many crossroads, forks, and stopgaps along the way. Some businesses are focused on getting additional value from their existing SAP environments. Others are ready to embrace SAP HANA or SAP S/4HANA as part of their migration. And some don't currently use SAP but are evaluating a cloud-based SAP implementation.

The following use cases demonstrate how AWS can help you make the transition to SAP in the cloud across four typical scenarios. Each provides a list of common challenges and corresponding solutions along with real-world case studies to demonstrate the advantages of running SAP environments on AWS.

# 1. Lift-and-shift/re-platform ECC

Many SAP customers want to reduce costs/technical debt and improve the reliability/performance of the SAP systems they already have. By bringing these SAP systems to AWS as is or with very minor changes to the operating system, database, or app layers, they can achieve these benefits and can get quicker time to value than is often possible with a database or application upgrade.

| Common challenge  | Cloud solution  |
|---|---|
| Reducing risk as you move your most mission-critical applications | AWS offers extensive experience and customer references, reducing risk and providing peace of mind.   |
| SAP Basis teams lack cloud skills                                 | AWS delivers purpose-built services to simplify SAP operations and management. These solutions shorten the learning curve and help your SAP administrators make use of their existing skill sets without advanced cloud expertise. Additionally, AWS can provide you with a resident architect who brings SAP and cloud expertise to your team while supporting you throughout the project. |
| Technical debt in ECC systems                                     | You can dramatically reduce technical debt in your SAP systems by moving to AWS. For example, during their migration of ECC, NBCUniversal was able to remove 54,000 customizations and reduce system size by 83 percent. This contributed to a 40 percent reduction in average user response times and a 65–94 percent improvement in job processing time. <sup>13</sup>                    |

## Success stories

Del Monte Foods was tasked with reducing IT costs, so the company decided to migrate its IT landscape—with SAP ECC at its core—to AWS, reducing costs by 35 percent.<sup>14</sup>

Hudbay Minerals brought its systems—which run ECC on Microsoft SQL Server—to AWS, which the company believes will save it \$100,000 in operating costs.<sup>15</sup>

Midas runs SAP ECC 6.0 on AWS, which has allowed it to reduce costs by 40 percent while improving SLA to 99.9 percent uptime and streamlining key compliance practices.<sup>16</sup>

<sup>13</sup> "The Story of NBCUniversal's SAP Journey to the Cloud," Migrate to AWS Online Event, AWS, 2020

<sup>14</sup> "From Produce to Productivity," Accenture white paper, 2019

<sup>15</sup> "Hudbay Runs SAP on AWS to Boost Performance and Cut Costs," AWS Case Study, 2021

<sup>16</sup> "Midas Safety Lowers TCO by 40% Running SAP on AWS," AWS Case Study, 2020



## 2. Migrating ECC on AnyDB to Suite on Hana

Organizations planning to move to S/4HANA at some point may choose to retain ECC as their ERP system but move from AnyDB (e.g., Oracle, SQL Server) to SAP HANA as part of their cloud migration.

| Common challenge   | Cloud solution   |
|--|--|
| Transitioning to the cloud and re-platforming on HANA at the same time       | AWS and AWS SAP Competency Partners can work with you to successfully make this transition.  |
| Ensuring data protection during the move to HANA                             | You can leverage a combination of tooling from AWS and its partners along with SAP (e.g., SUM DMO) to ensure your source data is protected during the move to the new HANA database.   |
| Data integration challenges given the complexity and rigidity of HANA schema | You may have data coming from hundreds or thousands of sources. While much of this data can and will reside in HANA, you can put other data in native AWS services and then use cloud analytics services in conjunction with HANA to reduce costs, drive deeper insights, and combine SAP with non-SAP data. |

### Success stories

Zappos worked with AWS to migrate from Oracle to Suite on HANA in less than two days. Since the move, the company has seen massive performance improvements to key processes that run in SAP, and the migration to HANA represents a key step in Zappo's journey to S/4HANA.<sup>17</sup>

By purchasing Goldcorp—the largest acquisition in the history of the gold industry—Newmont Corporation created a redundancy of SAP systems across three data center sites. Knowing its long-term plan was to move to S/4HANA but needing to get to the cloud quickly, Newmont chose to utilize a Suite on HANA implementation on AWS. Today, the company is in the process of using SAP Selective Data Transfer to leverage key operational data while still eliminating technical debt in its existing ECC-based systems as part of an S/4HANA implementation. Overall, Newmont has achieved annual cost savings of \$500,000.<sup>18</sup>

### 3. Migrating to S/4HANA

Organizations that want to holistically modernize their business processes may choose to move from ECC to S/4HANA as part of their cloud migration. And organizations that have outgrown their existing non-SAP ERP systems often look to cloud-based SAP (typically S/4HANA) implementations to gain additional functionality and support their continued growth.

| Common challenge   | Cloud solution   |
|--|--|
| Interruption to core business processes that are based on ECC                        | AWS provides professional services and works with AWS SAP Competency Partners to help you make the transition while minimizing disruption. Additionally, AWS Partner solutions can streamline data integration between source systems and the new S/4HANA environment.   |
| Funding a cloud migration and S/4 implementation at the same time                    | A move to S/4HANA is a long-term decision. AWS offers consulting support, training, and services credits to organizations that commit to running eligible SAP workloads on their platforms. The <a href="#">AWS Migration Acceleration Program</a> reduces the risk and cost of migrating to the cloud while helping you build a strong operational foundation for your SAP landscape. |
| Budget and timeline overruns   | AWS helps your organization accelerate time to value by pairing your team with certified SAP cloud consultants. By working with AWS and qualified AWS SAP Competency Partners, you can better ensure an implementation that meets (or even exceeds) budget and time requirements.  |
| Minimal in-house SAP expertise   | AWS and its partners provide expertise and solutions that make it easy for your IT admins to deploy SAP systems in the cloud in accordance with best practices, even if you don't have SAP expertise.  |
| Infrastructure dependencies for SAP teams  | AWS offers easy launch capabilities that can automatically make recommendations based on your unique SAP application requirements. This enables your team to deploy compute and storage resources that will provide the performance, reliability, and cost-effectiveness your SAP applications need.   |
| Management makes options like RISE with SAP and HEC feel like the only viable option | AWS provides professional services and managed services that offer more flexibility and cost-effectiveness than packaged offerings like RISE and HEC.  |



## Success stories

Phillips 66 is moving from R/3 on premises to S/4HANA on AWS to embrace industry standards, integrate siloed data, streamline and automate core processes, and future-proof itself against inevitable change.<sup>19</sup>

Bristol-Myers Squibb moved from ECC on-premises to SAP S/4HANA on AWS to retire technical debt and tackle the ECC end of support. As part of this transition, the company has also automated and standardized GxP compliance with AWS services.<sup>20</sup>

Peloton is implementing S/4HANA on AWS to support its long-term business growth and bring immersive and challenging workouts into people's lives in a more accessible, affordable, and efficient way. A five-month proof of concept gave Peloton the assurance and confidence to deploy the SAP S/4HANA platform that's mission-critical to its long-term business growth.<sup>21</sup>

<sup>19</sup> AWS re:Invent 2020: "[How Phillips 66 Transformed Its Business with SAP on AWS](#)," AWS on YouTube, AWS, 2021

<sup>20</sup> AWS re:Invent 2020: "[SAP Transformation and GxP Compliance at Bristol-Myers Squibb](#)," AWS on YouTube, AWS, 2021

<sup>21</sup> Niederman, C., "[AWS GSI Partners Help Customers Drive Innovation-Led Business Transformation](#)," AWS Partner Network (APN) Blog, 2020

## 4. Driving innovation, modernization, and transformation

Many organizations want to combine their SAP applications and data with capabilities they don't have on premises, including industry-specific solutions or advanced technologies like advanced analytics, AI/ML, and IoT.

| Common challenge   | Cloud solution   |
|--|--|
| Difficulties with integrating SAP applications and native cloud services                 | AWS and its partners offer services purpose-built for easy SAP integration and standard SAP functionality.   |
| Combining SAP data with other enterprise data to gain a more holistic view of operations | AWS enables your organization to combine your SAP data with data from other sources in repositories such as data lakes. Your team can then more easily use AWS analytics and machine learning services to get more value from the data you already have. |
| Modernizing core business processes without investing in an S/4HANA upgrade              | You can modernize your infrastructure by combining the ECC systems your business processes depend on with AWS services.  |

### Success stories

INVISTA combined SAP from its decades-old ECC environment with other enterprise data in an AWS data lake and now uses other AWS services to modernize its core operational processes. For instance, the company uses AWS machine learning video and image analysis to automatically identify faulty parts and additional machine learning solutions to perform predictive maintenance. INVISTA believes these operational improvements will deliver \$300 million in operational value.<sup>22</sup>

Zalando runs the SAP systems that support its online fashion platform, which attracts 350 million visits per month and has 31 million active customers, on AWS. Zalando integrated its SAP systems with 36 AWS technologies and created a hybrid data architecture, giving them a more cost-effective alternative to running a larger SAP S/4HANA database. By optimizing usage of AWS services such as EC2 with Intel® Xeon® processors, Zalando is able to derive businesses insights at 30 percent lower cost.<sup>23</sup> The company is also able to offer a better experience for its customers. For example, the company uses machine learning-based automated image processing to speed up invoice processing and an AI chatbot to improve customer response time.



# Conclusion

## About AWS

In 2006, Amazon Web Services (AWS) began offering IT infrastructure services to businesses in the form of web services—now commonly known as cloud computing. One of the key benefits of cloud computing is the opportunity to replace upfront capital infrastructure expenses with low variable costs that scale with your business. With the cloud, businesses no longer need to plan for and procure servers and other IT infrastructure weeks or months in advance. Instead, they can instantly spin up hundreds or thousands of servers in minutes and deliver results faster.

Today, AWS provides a highly reliable, scalable, low-cost infrastructure platform in the cloud that powers hundreds of thousands of businesses in 190 countries around the world. With AWS data center locations in the US, Europe, Brazil, Singapore, Japan, and Australia, customers across all industries are taking advantage of benefits such as lower costs, agility and instant elasticity, openness and flexibility, and security.

To learn more about AWS, visit [aws.amazon.com](https://aws.amazon.com).

## Resources to get started

- [Learn more about running SAP workloads on AWS](#)
- [Find Amazon EC2 instances SAP-certified and powered by Intel for your application](#)
- [Find an APN Partner to help you transform your SAP environment](#)