

# CONSIDERATIONS FOR SAP APPLICATIONS ON AWS

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Cloud adoption has quickly matured past a trend, into a reality as mid-sized and enterprise-level organizations continue to shift mission critical workloads from on-premises data centers to cloud environments. With cloud infrastructure services growing at a rate of 27.6 percent in 2019 to reach \$39.5 billion, according to a recent Gartner report<sup>1</sup>, the benefits of application availability, improved workload management agility, optimized performance, and improved security, demonstrably outweigh the “do it yourself” approach.

As companies merge, acquire, and expand, they inevitably end up with a patchwork of company-owned and co-located data centers, hosted and managed environments, and a labyrinth of networks. This complicated environment ends up consuming their people, funding, and attention at the expense of innovation and competitive operating margins.

Of the multiple cloud options available today, Gartner forecasts demand for the public cloud market will grow 17.3 percent in 2019 to total \$206.2 billion, up from \$175.8 billion in 2018<sup>1</sup>.

This document provides proven methods and considerations for how organizations are using the cloud and multiple ways to transition SAP applications from traditional on-premises environments to the cloud. Ultimately, customers that are running full production workloads and the associated supporting infrastructure on a fully integrated hyper-scale, single cloud environment like Amazon Web Services (AWS), will produce faster innovation for their customers and have a competitive advantage. The following are some intermediary steps that customers can quickly adopt as they advance to a single, fully integrated cloud environment.

<sup>1</sup> <https://www.gartner.com/en/newsroom/press-releases/2018-09-12-gartner-forecasts-worldwide-public-cloud-revenue-to-grow-17-percent-in-2019>

# CONSIDERATIONS FOR SAP APPLICATIONS ON AWS

## Cloud is the New Normal

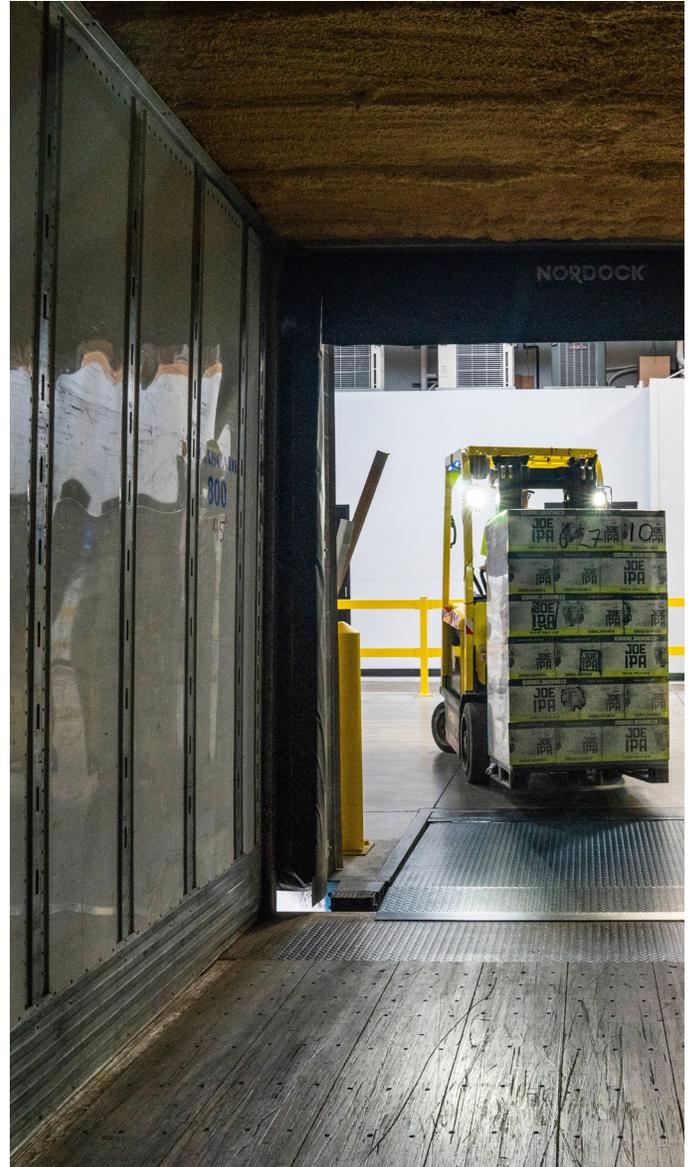
All organizations are now under pressure to accelerate their digital transformation strategies with Internet of Things (IoT), Big Data, mobile and many other new technologies as business drivers. For a traditional enterprise organization, these changes tend to occur within an already tight IT budget, laden with fixed costs. Typically, the added constraints leave little to no room for innovation. Cloud-native competitors, who have enabled their organization with agile micro-services architectures are creating scalable environments and don't face the same costly infrastructure upgrades and resource-consuming application lifecycle maintenance of legacy applications and hardware refresh cycles. Instead, cloud-first strategies offer the full advantage of a hyper-scale environment that bridges the needs of the front office to keep costs low while enabling the back office to stay innovative. Further, as companies experience the cloud's benefits, they learn how to better leverage the cloud's capabilities to fuel other business initiatives.

## Don't Go It Alone: The Business Case for SAP on AWS

AWS offers a large inventory of SAP-certified instances readily available for both production and non-production usage. Its global infrastructure is designed around regions with multiple Availability Zones, creating the most reliable environments available today. The advancements in security, with investments in infrastructure hardening, physical, operational, and software measures, are completed on a massive scale and readily available to the enterprise. This scalability, reliability, resiliency, and flexibility offered by AWS is out of the reach of traditional enterprise on-premises environments.

**AWS and SAP have been co-innovating since 2008**, which has given AWS years of access to SAP resources and joint customers which has led to the leading portfolio of SAP certified hyper-scale cloud offerings that exist today. New SAP customers can easily adopt SAP on AWS and be underway with a low-cost, low-risk path to a world-class digital enterprise. However, existing customers that are laden with hundreds of applications sitting in dozens of environments running in legacy data centers are faced with a more daunting challenge.

- How can they stay competitive with companies that are starting new today on a single, fully integrated public cloud platform?
- What are the proven methods to transition from a complex mix of data centers to a single hyper-scale cloud architecture?



The following are proven use cases that companies are leveraging today that are helping them take advantage of what the hyper-scale cloud offers.

## Adopting and Leveraging AWS for SAP: The Use Cases

Let's evaluate some use cases where integrating AWS resources for your enterprise can help optimize your SAP applications and aid in the transition to a hyper-scale environment.

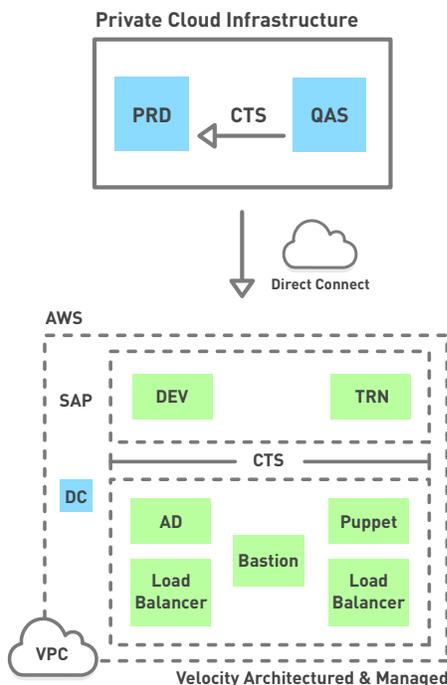


**Your current SAP application and infrastructure environment likely have some of the following characteristics:**

- An active user community with constant demand for changes and/or enhancements

**Required upgrade to SAP EHP7 to provide functional advantages for users**

- Technical teams that must be Unicode compliant before upgrading to EHP7
- Projects that include numerous application enhancements, interface updates, and report modifications
- Requests requiring IT infrastructure and SAP technical resources to support



## Solution

Consider optimizing your current SAP landscape by moving non-production infrastructure to a dynamic cloud infrastructure (see Diagram A). Many customers choose this as a starting point for reducing their data center footprint and to get their existing staff prepared for a more expansive cloud strategy. This method allows you to retain your production (PRD) and quality assurance (QAS) application instances in your current infrastructure while moving all non-production instances such as development (DEV), and training and testing (TRN) to AWS. This is the lowest risk / reward approach but does get the organization started and often helps “demystify” the cloud in the process.

Your change and transport system (CTS) structure would flow within the non-production landscape and then eventually from testing to QAS in your primary infrastructure. This will allow QAS to be in sync with PRD and also allow for any final simulation or validation before the final CTS moves to production.

Remember that when planning a cloud strategy, consider that cloud migration is only part of the equation. To fully realize your cloud investment, analysts emphasize the importance of a managed cloud approach, which helps organizations optimize and innovate their cloud-bound applications and manage cost, while reducing waste and sprawl. This is especially true for organizations in which IT infrastructure management is not a core business focus.

## Business Benefits

### Cash Flow and CapEx Optimization

By moving a heavily utilized non-production landscape to a more dynamic infrastructure you can optimize your cash resources. You eliminate the need to consistently purchase additional hardware for compute storage and infrastructure to enhance backup and refresh routines. No longer are you stuck with infrastructure purchases that quickly become outdated. Instead, you can leverage application instances for short periods of time, knowing you are always running on the most current infrastructure. Additionally, by aligning spend to usage, you align cash flow and expense optimization. This flexibility to tighten SAP resources deployment with functional needs is only available because of the on-demand characteristics of the dynamic AWS environment. With a software driven platform, specialty SAP partners can provide you with automated routines to perform commonly required tasks like provisioning of new application-ready instances, client copies, and system refreshes.

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**...by aligning spend to usage, you align cash flow and expense optimization.**

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### Speed and Flexibility of Access to SAP Instances

Unlike traditional infrastructure, the dynamic nature of AWS enables you to trigger infrastructure capacity utilization quickly and efficiently. You eliminate the process typically associated with manual-sizing exercises followed by a lengthy procurement process that involves physical shipment and installation of hardware. Today, with the availability of software-driven application management platforms, functional user communities can request and receive SAP instances that have been configured and are ready for functional use within minutes. This dramatically enhances the user experience, allowing your functional users to access systems with no disruption to the business.

### Eliminate and/or Minimize IT Resource Constraints

If your enterprise is like most others, there is a constant demand of requests for your critical IT resources that support the SAP environment for functional teams. Each of these requests typically require skills like systems administration, database management, and SAP BASIS to assist with system maintenance. Simplified and easily consumable cloud enabled features will allow your functional teams to subscribe to SAP-focused infrastructure solution elements. This will enable your IT

teams to support a larger number of initiatives and manage the deployment and consumption strategy instead of becoming a bottleneck or resource constraint.

## Considerations

With every approach, it is important to adequately assess areas of caution. These are the factors to consider before you embark upon leveraging a hybrid and dynamic cloud infrastructure.

Now that you have empowered your users to take advantage of self-service utilities and solutions, you have to mitigate the risk of managing runaway IT projects. Implementing the appropriate governance structure to manage spend with cloud providers and validating that processes shut down usage when it is not required, are critical elements of success for these flexible IT solutions.

By leveraging AWS, you are providing ultimate freedom for your users to self-configure and launch development and testing SAP application instances within a cloud environment. It is important to maintain the SAP transport management integrity between production and non-production landscapes making sure that their physical separation does not cause a disruption. In addition, all the elements of the technical stack, like software release levels, should be aligned between these two environments to enable portability across these landscapes. Once these evaluations, configuration changes, and optimizations are completed and validated in non-production, changes can be transported to the production landscape.

# MANAGED DISASTER RECOVERY USING THE AWS GLOBAL INFRASTRUCTURE



## Your SAP application and infrastructure environment likely has some of the following characteristics:

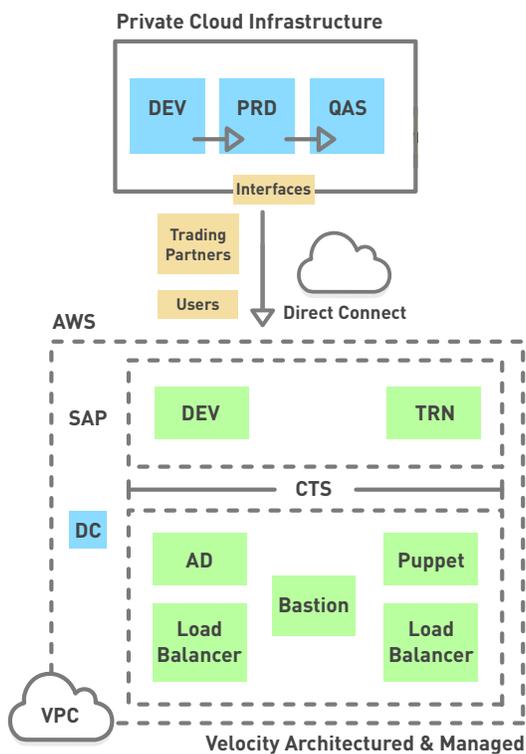
- Costly hardware-focused business continuity strategy that includes investments in resources that are idle, lack automation, and aren't tested on a regular basis.
- A disaster recovery (DR) strategy that isn't truly physically independent or is dependent on multiple co-location providers.

## Solution

To enable business continuity, savvy organizations build a fully redundant SAP environment at least 100 miles away – in a separate Availability Zone – to make sure they stay operational in the case of unforeseen circumstances such as a natural disaster, cyber-attack, or major infrastructure outage.

Maintaining continuity requires the procurement, design, and deployment of sizable hardware. You need to have a process in place to make sure that backup files, log files, and database files are available for restoration within an acceptable outage window. Additionally, you need to employ the skills, process, and technology to conduct recovery tests on a frequent basis and maintain the recovery procedures to make sure that you have an effective DR solution. At the outset, this appears to be an overwhelming task -- and the costs incurred to maintain this environment in compliance are not trivial.

A cloud-based managed disaster recovery solution (see Diagram B) provides you with a secure, redundant SAP environment and tight recovery windows without the upfront capital and software investment.



## Business Benefits

### Improved Total Cost of Ownership for Disaster Recovery

Eliminate the need for idle resources and optimize spending by leveraging a dynamic infrastructure along with SAP deployment automation. You can synchronize the timing of log shipments along with software automation for database backup and restoration procedures. This will support the activation of a redundant landscape for restoring your SAP production environment within hours. According to [Gartner's IT Key Metrics Data 2018 report](#), system costs make up between 18% and 24% of capital spend (in the case of Linux and Windows servers, respectively), whereas the cost of software and administration ranges between 68% (Windows) and 72% (Linux) capital that is dedicated for disaster recovery or through allocation of certain infrastructure on a partial basis.

With a managed disaster recovery solution that is well-architected and leverages the dynamic capabilities of AWS—you could save more than 70% compared to traditional approaches for DR. With the global infrastructure available through AWS, configuring your database backups and change logs to be replicated and stored at an alternative region can be handled with a number of flexible options. This minimizes the outage windows and provides the enterprise with geographical redundancy. The costs associated with having compute resources on standby are eliminated while costs are optimized and incurred only upon usage.

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**With a managed disaster recovery solution...you could save more than 70%.**

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### Higher Assurance and Compliance with Disaster Recovery Programs

The advantage of using a pre-configured architecture that can be activated through software-driven automation routines is the flexibility to test your DR without incurring the overhead associated with a traditional redundant architecture setup. Once you have the recovery procedures documented along with the run books, escalation and communication protocols, the technical aspect of the solution can be evaluated at any time. The interfaces will need to be redirected and the SAP application will need to be restored from the recent backups and logs, however with a coordinated project plan, these can be executed in a reasonably short period. Most standard DR solutions with Recovery Time Objective (RTO)/Recovery Point Objective (RPO) of 48/24 require careful architectural design and infrastructure readiness. Once the setup is completed, the

recovery testing process can be automated and validated at periodic intervals for compliance and to provide a higher level of assurance.

### Resource Optimization

With a managed DR solution, you can now rely on experts who deliver these services as a standardized and repeatable offering, optimizing the process of recovery procedures by maintaining runbooks, performing validation routines and testing, and communications. **By deploying this as a managed service, organizations can keep their resources focused on their core activities and priorities** while leveraging the managed disaster recovery service provider to handle the complete solution.

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## Considerations

### Completeness of Your Disaster Recovery Environment

Assess all the critical business processes, both online and batch, required to keep your SAP landscape operational and effective during an unforeseen event. Pay close attention to how interfaces to trading partners, suppliers, and other third-party applications are configured, as well as their ability to be redirected. Review whether key users are connected via the Gateway server or Fiori interfaces using your internet connection. The recovery procedures should clearly document actions that may need to be taken by each type of users to validate they are able to connect to the DR environment.

### Complete an Accurate Testing Scope and Process

It is critical for your periodic DR tests to be representative of your production workloads and landscape. The sizing and processing needs should also be evaluated to validate that during an unforeseen event, your users are able to perform all the key business transactions with reasonable system response times. This should be addressed as part of the testing procedure development and should be validated during the annual or semi-annual RP testing process.

# Use Case 3: SEAMLESSLY MANAGE YOUR SAP APPLICATIONS



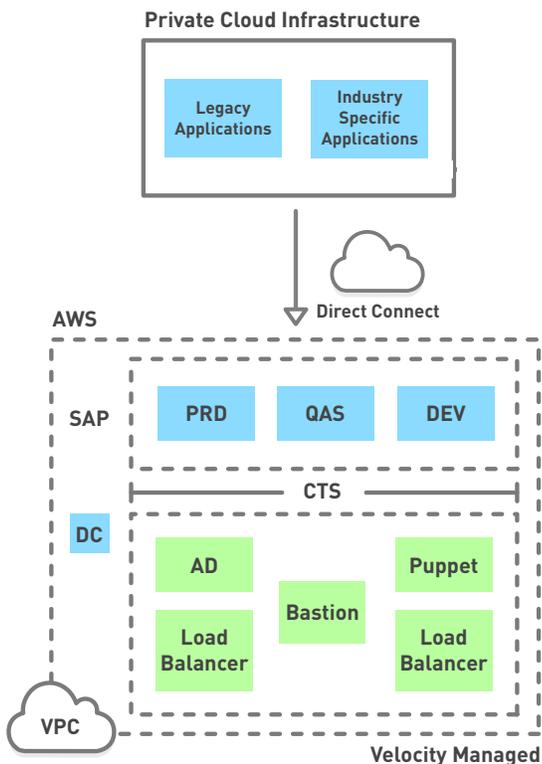
## Your SAP application and infrastructure environment likely has some of the following characteristics:

- Highly technology savvy business users with a clear line of sight into world-class digital competitors for their industry
- Existing use of SAP industry applications and extensions for competitive positioning
- Strong desire to release new offerings and innovations quickly to users and customers
- Required to provide innovation while the existing budgets are being absorbed by the traditional data center and environment costs

## Solution

If your SAP landscape is large and distributed to support global users, your infrastructure teams need to provide 24/7 support to a diverse set of users. To combat this, your organization needs to pivot towards next-generation technology with big data, IoT, and advanced analytics to meet competitive pressures and maintain growth targets. IT teams have to help the business community in adapting new technologies while you continue to spend a significant portion of the current budget on supporting and managing your SAP technical landscape.

If your global application footprint includes a broad mix of industry specific applications tightly integrated with your SAP enterprise landscape, a viable solution is to migrate your SAP landscape to a dynamic cloud infrastructure and adopt a public cloud strategy (see diagram C) to manage and support the breadth of applications across the enterprise.



## Business Benefits

### Lower Total Cost of Ownership (TCO)

This approach gives you an opportunity to optimize your SAP environment configuration and resize the landscape to better align with your usage and requirements. With the use of Amazon Elastic Cloud Compute (Amazon EC2) instances, Amazon Simple Storage Service (Amazon S3) storage blocks, and the ability to leverage offline storage techniques like Amazon Glacier, you can lower your cost for operating an SAP infrastructure. To get an idea on how much you could potentially lower your total cost of ownership (TCO) – use this [TCO Calculator](#).

TELL US ABOUT YOUR ENVIRONMENT

Number of Virtual Machines for Development Testing	Number of Web Application Virtual Machines
#:	#:
Number of Production Virtual Machines	Total Storage Utilized (GB/Month)
#:	#:
Number of Supported Users	Number of Database Instances
#:	#:

**CALCULATE** \* See Note [DON'T KNOW THESE VALUES](#)

### Shifting Capital Spend to Operating Expense

All the capital investment expended to build out your private cloud SAP landscape does not have to be repeated in a dynamic cloud infrastructure. You can now subscribe to SAP certified Amazon EC2 instances to match your SAP application processing requirements. The memory and CPU sizing can be optimized based on actual usage and your storage requirements can be allocated between short-term and longer-term requirements, saving you storage infrastructure costs. The other advantage with migrating your SAP landscape to AWS is leveraging the elastic aspects of the cloud to manage your SAP infrastructure costs. For non-production environments that may be required for periodic intervals such as testing or training, you no longer need to allocate and dedicate hardware infrastructure. This can be met by subscribing to SAP application instances for the specific period of time, optimizing your infrastructure spend.

### Improved Reliability and Resiliency

With the advent of cloud specialist providers, the service levels for providing a reliable and resilient infrastructure has progressed significantly. Investments in security and

trending technologies combined with the ability to leverage geographically diverse data centers as part of the core operating model deliver huge benefits to an enterprise that needs to maximize application uptime for its SAP landscape.

**Migrating your SAP environment to AWS provides your end-user community with improved application availability and the potential for better application performance.**

## Considerations

### Migration Impact on Business

Although the process and tools for a technical migration from an on-premises environment to the cloud has advanced in recent times, it is necessary to evaluate the potential business impact that could result from a move. Timing of the cutover, duration of the migration, and level of involvement required are all key factors to consider. It is critical for your organization to participate in the system acceptance testing process and to help validate that your current environment was migrated to the target completely and accurately. Carefully plan the timing of the move and pre-determine the level of testing to meet the assurance levels of end-users to enable a smooth transition. A recommendation would be the use of a proven methodology along with automation tools that provide validation steps within the migration process. In addition, migrating the non-production environments as a precursor to make sure the process works is highly recommended before the final cutover.

### Realization and Change Management

Prior to launching this approach, you need to complete a business case highlighting the various areas of cost savings and optimization. After migration, it is important to validate the cost and optimization benefits are continually being realized. Along with the financial benefits, organizations experience improved application performance, productivity gains from speedier batch job updates, and quicker access to analytics based on improved processing power. Each of these areas should be documented, and if possible, quantified to understand the complete impact of migrating to AWS. In general, we have found that most IT organizations evolve by shifting their key IT resources to next-generation initiatives. With a much more reliable infrastructure, users from the functional teams interact with application managed service providers that can deliver expertise around application optimization and management.

These scenarios show where running SAP applications while leveraging AWS improves the return on investment on your total SAP solution.

Traditional concerns over security, data privacy, and lacking the skill set to manage cloud environments have strong mitigation options today as enterprises adopt cloud at a fast clip. A sound strategy for deploying, managing, monitoring, and adapting to the changes in the application lifecycle is required, and your enterprise may best be served by a managed services provider.

**Begin with a partner who has a defined roadmap, and is able to offer the following options:**

- Rapid, low-risk migration to AWS
- Functional & technical SAP and SAP HANA expertise and support
- Automated DevOps platform for rapid provisioning, saving you time and resources
- Full service, flexible managed services for SAP and all it integrates with

## Get Started Today

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