

# SAP HANA on AWS

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## Abstract

For SAP customers and partners who are new to Amazon Web Services (AWS), learning about and understanding how to run SAP HANA on the AWS Cloud may seem a bit overwhelming at first. This guide will help you understand the options, benefits, and process for running SAP HANA on the AWS Cloud.

## AWS Overview

Amazon Web Services (AWS) provides on-demand computing resources and services in the cloud, with pay-as-you-go pricing. You can run a server on AWS and log in, configure, secure, and operate it just as you would operate a server in your own data center.

Using AWS resources for your compute needs is like purchasing electricity from a power company instead of running your own generator, and it provides many of the same benefits:

- The capacity you get exactly matches your needs.
- You pay only for what you use.
- Economies of scale result in lower costs.
- The service is provided by a vendor who is experienced in running large-scale compute and network systems.

## AWS Global Infrastructure

The AWS Cloud infrastructure is built around Regions and Availability Zones. A Region is a physical location in the world where AWS has multiple Availability Zones. Availability Zones consist of one or more discrete data centers, each with redundant power, networking, and connectivity, and housed in separate facilities. These Availability Zones offer you the ability to operate production applications and databases that are more highly available, fault-tolerant, and scalable than would be possible from a single data center.

For additional information about AWS Regions and Availability Zones, see the [AWS Global Infrastructure](#) webpage.<sup>1</sup>

## AWS Security and Compliance

The AWS Cloud security infrastructure has been architected to be one of the most flexible and secure cloud computing environments available today. Security on AWS is very similar to security in your on-premises data center, but without the costs and complexities involved in protecting facilities and hardware. AWS provides a secure global infrastructure, plus a range of features that you can use to help secure your systems and data in the cloud. To learn more about AWS security, visit the [AWS Security Center](#).<sup>2</sup>

AWS compliance enables customers to understand the robust controls in place at AWS to maintain security and data protection in the cloud. AWS engages with external certifying bodies and independent auditors to provide customers with extensive information regarding the policies, processes, and controls established and operated by AWS. To learn more about AWS compliance, visit the [AWS Compliance Center](#).<sup>3</sup>

## AWS Products and Services

AWS provides an extensive set of computing resources and services. The following sections provide an overview of the AWS services that are most relevant for the implementation and operation of SAP HANA.

### Compute

[Amazon Elastic Compute Cloud \(Amazon EC2\)](#) provides scalable computing capacity in the AWS Cloud.<sup>4</sup> Amazon EC2 offers a wide selection of virtual machine configurations that support different CPU, memory, network, and I/O capabilities. For running SAP systems, Amazon EC2 provides virtual machine instances for the Microsoft Windows Server, SUSE Linux Enterprise Server (SLES), and Red Hat Enterprise Linux (RHEL) operating systems.

### Storage

[Amazon Elastic Block Store \(Amazon EBS\)](#) provides persistent block-level storage volumes for use with Amazon EC2 instances.<sup>5</sup> Amazon EBS volumes are highly available and reliable storage volumes that can be attached to any running instance. Amazon EBS volumes that are attached to an Amazon EC2 instance are

exposed as storage volumes that persist independently from the lifetime of the instance. Amazon EBS volumes are designed for 99.999% availability.

[Amazon Simple Storage Service \(Amazon S3\)](#) provides access to reliable, fast, and inexpensive data storage infrastructure.<sup>6</sup> Amazon S3 stores data objects redundantly on multiple devices across multiple facilities. This service provides highly available and highly durable backup storage for your SAP systems on AWS.

## Networking

[Amazon Virtual Private Cloud \(Amazon VPC\)](#) enables you to define a virtual network in your own logically isolated area within the AWS Cloud.<sup>7</sup> Your Amazon VPC closely resembles a traditional network that you might operate in your own data center, but it includes the benefits of using the AWS scalable infrastructure. You can connect your Amazon VPC to your own corporate data center to provide seamless integration between on-premises users and systems, and SAP systems in your Amazon VPC.

## Deployment and Management

The [AWS Management Console](#) provides a simple and intuitive web-based interface for provisioning and managing AWS resources.<sup>8</sup>

[AWS CloudFormation](#) gives you an easy way to create and manage a collection of related AWS resources, and provision and update them in an orderly and predictable fashion.<sup>9</sup>

# SAP on AWS

## AWS and SAP Partnership

SAP has been an AWS customer since 2008 and uses the AWS infrastructure for a variety of use cases and scenarios. In early 2011, AWS became an SAP Global Technology Partner. Since then, AWS has worked closely with SAP to test and certify the AWS Cloud for SAP solutions.

## SAP Support on AWS

SAP provides the same level of product support for SAP systems running on AWS that it does on any other infrastructure. Full support of SAP production systems running on AWS requires the AWS Business or Enterprise support plan.

For additional information about AWS Support, see <http://aws.amazon.com/premiumsupport/>.

For additional information about SAP support on AWS, see [SAP Note 1656250](#) (SAP Support Portal login required).<sup>10</sup>

## SAP HANA on AWS

### Benefits of Running SAP HANA on AWS

**Lower TCO** – Benefit from the economies of scale and efficiencies provided by AWS. Pay for only the compute, storage, and other resources you use. [Read about](#) savings of up to 71% compared to running SAP systems on premises.<sup>11</sup>

**Replace CapEx with OpEx** – Start an SAP 4HANA implementation on AWS without any upfront cost or commitment for compute, storage, or network infrastructure.

**Agility and speed** – Provision the required infrastructure for an SAP HANA implementation in one hour or less, compared to waiting weeks or months to procure and deploy traditional infrastructure.

**Scalability** – Provision only the amount of infrastructure and memory initially required for your SAP HANA system, and then scale the infrastructure and memory as your requirements increase over time.

### SAP HANA Offerings on AWS

Multiple options for running SAP HANA are available on AWS that allow you to best meet the requirements of your use case and scenario. Following is an overview of the different SAP HANA offering available on AWS.

## SAP HANA Bring-Your-Own-License

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<b>Overview:</b>	On-demand infrastructure for SAP HANA systems using a bring-your-own-software and bring-your-own-license model for SAP HANA
<b>Supported use cases:</b>	Non-production and production
<b>Supported scenarios:</b>	<ul style="list-style-type: none"><li>- Native HANA applications</li><li>- Data marts, analytics, and big data</li><li>- SAP Business Suite on HANA</li><li>- SAP S/4HANA, on-premise edition</li><li>- SAP BW/4HANA</li><li>- SAP Business Warehouse on HANA</li><li>- SAP Business Planning and Consolidation on HANA</li><li>- SAP Business One on HANA</li></ul>
<b>Software:</b>	Bring-your-own
<b>Licensing:</b>	Bring-your-own
<b>Memory:</b>	Scale-up – 4* TB   Scale-out – 34 TB
<b>Deployment:</b>	AWS Quick Start – <a href="#">Learn more &gt;&gt;</a>

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\* Planned availability: Q3 2017

## SAP HANA One

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<b>Overview:</b>	On-demand infrastructure and on-demand SAP HANA licenses starting at \$0.99 per hour, sold by SAP via the AWS Marketplace
<b>Supported use cases:</b>	Non-Production and Production
<b>Supported scenarios:</b>	<ul style="list-style-type: none"><li>- Native HANA applications</li><li>- Data marts, analytics, and big data</li></ul>
<b>Software:</b>	Pre-installed
<b>Licensing:</b>	On-demand
<b>Memory:</b>	60 GB   122 GB   244 GB
<b>Deployment:</b>	AWS Marketplace – <a href="#">Learn more &gt;&gt;</a>

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## SAP HANA Developer Edition

<b>Overview:</b>	On-demand infrastructure with free SAP HANA developer license from SAP
<b>Supported use cases:</b>	Non-production, development, learning, etc.
<b>Supported scenarios:</b>	- Native HANA applications - Data marts, analytics, and big data
<b>Software:</b>	Pre-installed
<b>Licensing:</b>	Free developer license provided by SAP
<b>Memory:</b>	17 GB   32 GB   68 GB
<b>Deployment:</b>	SAP Cloud Appliance Library – <a href="#">Learn more &gt;&gt;</a>

## SAP HANA Trials

<b>Overview:</b>	Free software trials of SAP solutions running on SAP HANA offered by SAP
<b>Software:</b>	Pre-installed
<b>Licensing:</b>	Free software trial license provided by SAP; customer pays for underlying AWS infrastructure used during duration of trial period
<b>Deployment:</b>	SAP Cloud Appliance Library – <a href="#">Learn more &gt;&gt;</a>

## SAP HANA BYOL on AWS

### Overview

The SAP HANA bring-your-own-license offering on AWS provides on-demand cloud infrastructure for your SAP HANA systems using a bring-your-own-software and bring-your-own-license model.

### Deployment

To simplify and accelerate the provisioning of the required AWS infrastructure components and the installation and configuration of the SAP HANA system, AWS has created the [SAP HANA Quick Start reference deployment](#)<sup>12</sup>. The SAP HANA Quick Start reference deployment is an automated process built using [AWS CloudFormation](#) that follows both AWS and SAP best practices for security and performance. The SAP HANA Quick Start reference deployment is provided at no additional cost.

## Supported SAP HANA System Types and Configurations

SAP HANA systems can be deployed in two system type configurations: scale-up (single-host) and scale-out (multiple-host). Both configurations are supported on AWS. The following information describes different HANA system type configurations and application scenarios supported for each.

**Scale-up** – supported for OLTP applications; for example:

- SAP Business Suite (ERP)
- SAP S/4HANA

**Scale-out** – supported for OLAP applications; for example:

- Native SAP HANA applications
- Native SAP HANA data marts
- SAP Business Warehouse
- SAP BW/4HANA

The following table shows the SAP HANA scale-up and scale-out configurations currently supported on AWS.

Instance Type	vCPU	Mem*	Scale-Up		Scale-Out	
			Nodes	Mem*	Nodes	Mem*
r3.8xlarge	32	244	1	244	17	4,148
r4.16xlarge	64	488	1	488	TBD	TBD
x1.16xlarge	64	976	1	976	7	6,832
x1.32xlarge	128	1,952	1	1,952	17	33,184
x1e.32xlarge**	128	3,904	1	3,904	TBD	TBD

\*GiB

\*\*Planned availability: Q3 2017. For additional information, see [EC2 In-Memory Processing Update: Instances with 4 to 16 TB of Memory + Scale-Out SAP HANA to 34 TB](#).

## Network Connectivity

AWS provides multiple network connectivity options between your SAP HANA environment on AWS and your users, on-premises systems, and external systems. The basis for network security and connectivity on AWS is the [Amazon Virtual Private Cloud \(Amazon VPC\)](#). Amazon VPC enables you to provision a logically isolated section of the AWS Cloud where you can launch AWS resources in a virtual network that you define. You have complete control over your virtual networking environment, including selection of your own IP address range, creation of subnets, and configuration of route tables and network gateways.

### VPC Connectivity Options

- **AWS hardware VPN** – A site-to-site IPsec, hardware VPN connection between your VPC and your remote network, which provides seamless network connectivity for users and system integration. For more information, see [Amazon VPC Network Administrator Guide](#)<sup>13</sup> and [Adding a Hardware Virtual Private Gateway to Your VPC](#) in the *Amazon VPC User Guide*.<sup>14</sup>
- **Dedicated network connection** – [AWS Direct Connect](#) enables you to establish private connectivity between AWS and your data center, office, or colocation environment.<sup>15</sup>
- **Direct Internet** – Amazon EC2 instances that are running within a public subnet can be accessed via a direct Internet connection. This option is recommended only for test, trial and demo systems.

## Backup and Recovery

AWS provides you with the infrastructure building blocks to build a highly durable and secure backup and recovery solution to protect your valuable data. Backup and recovery on AWS uses many of the same concepts, methods, and tools used to back up SAP systems on traditional on-premises infrastructure. The primary difference with backup and recovery on AWS is the media and location used to store backups. On AWS, backups are stored in Amazon S3 and automatically stored “offsite,” outside the Availability Zone of the system, because data in Amazon S3 is replicated across multiple facilities within the AWS Region. If the primary Availability Zone fails, the backup can immediately be used to restore data to any of the other Availability Zones within the Region.

For additional information about the backup and recovery of SAP systems on AWS, see the [SAP on AWS Backup and Recovery Guide](#).<sup>16</sup>

## High Availability and Disaster Recovery

AWS's global infrastructure, multiple Availability Zones per Region, compute services, and storage services provide you with the building blocks to design and implement high availability (HA) and disaster recovery (DR) architectures to protect your SAP HANA environment. To learn more about the different options available for SAP HANA HA and DR on AWS, see the [High Availability and Disaster Recovery Options for SAP HANA on AWS](#) guide.

## AWS Infrastructure Pricing for SAP HANA

With AWS, you pay only for what you use with no minimum fee. Amazon EC2 offers [multiple options](#) to pay for instances.<sup>17</sup> The two purchasing options most relevant for SAP systems are:

- **On-Demand** – Lets you pay for compute capacity by the hour with no long-term commitments or upfront payments.
- **Reserved** – For applications that have steady state or predictable usage, this option can provide significant savings compared to using On-Demand instances.

To help you estimate the cost of AWS infrastructure for your SAP HANA environment on AWS, sample SAP HANA infrastructure configurations with monthly price estimates can be found on the [SAP HANA on AWS](#) webpage.<sup>18</sup>

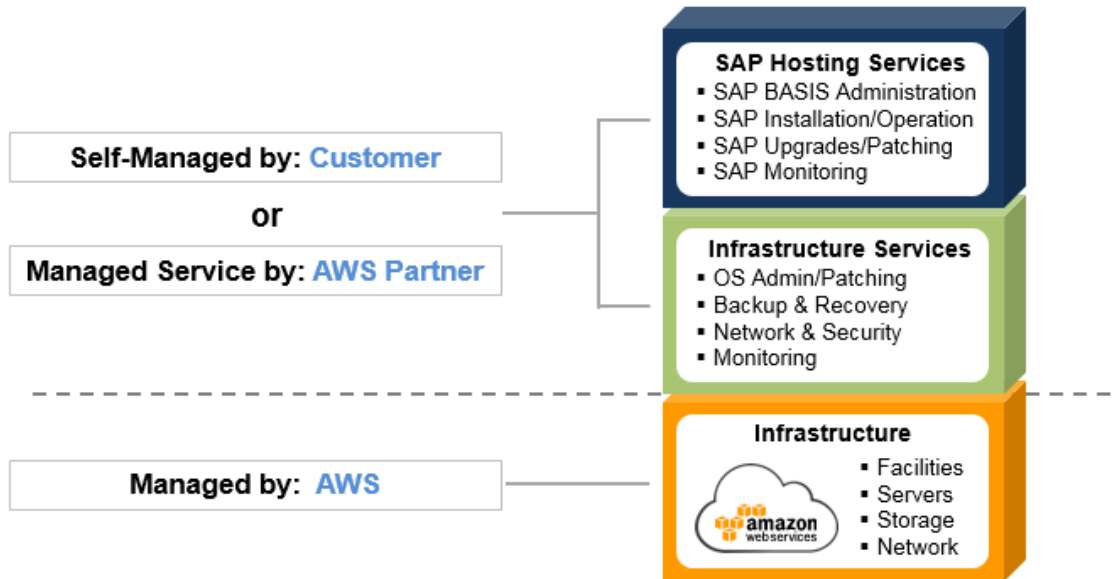
For additional information about estimating the price of AWS infrastructure for SAP on AWS see the [SAP on AWS Pricing Guide](#).

## Managed Services for SAP on AWS

AWS provides you the flexibility to choose between infrastructure services only or a complete managed service. For the primary AWS services required for an SAP environment, AWS manages the underlying infrastructure up to the virtualization layer. Maintenance and administration of the operating system, any applications, and databases running above the operating system are managed by the customer or by a partner.

If you require a managed service for your SAP HANA environment on AWS, AWS has a network of partners that can provide a fully managed hosting service. To learn more about services for SAP on AWS and to find an SAP partner within the AWS Partner Network, see <http://aws.amazon.com/sap/find-partners/>.

The following figure depicts the two most common scenarios for managing SAP solutions on AWS:



Options for Managing SAP Solutions on AWS

## Partner with AWS

If you are an SAP partner, you can combine your services for SAP and the AWS platform to provide your customers with innovative solutions to reduce their cost and time to value. The AWS Partner Network (APN) is the global partner program for AWS. As an APN partner you will gain access to a range of resources and training that will enable you to better help your customers deploy, run, and manage applications in the AWS Cloud. If you would like to learn more about the AWS Partner Network, visit the [AWS Partner Network](#) website.<sup>19</sup>

## Additional Information

For the latest information about SAP on AWS and to learn more about running your SAP environment on AWS, see <https://aws.amazon.com/sap>.

If you have any questions about SAP on AWS, please contact us at <https://aws.amazon.com/sap/contact-us/>.

## Contributors

The following individuals and organizations contributed to this document:

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## Notes

<sup>1</sup> <https://aws.amazon.com/about-aws/global-infrastructure/>

<sup>2</sup> <https://aws.amazon.com/security/>

<sup>3</sup> <https://aws.amazon.com/compliance/>

<sup>4</sup> <https://aws.amazon.com/ec2/>

<sup>5</sup> <https://aws.amazon.com/ebs/>

<sup>6</sup> <https://aws.amazon.com/s3/>

<sup>7</sup> <https://aws.amazon.com/vpc/>

<sup>8</sup> <https://aws.amazon.com/console/>

<sup>9</sup> <https://aws.amazon.com/cloudformation/>

<sup>10</sup> <https://service.sap.com/sap/support/notes/1656250>

<sup>11</sup> <https://aws.amazon.com/whitepapers/vms-sap-tco/>

<sup>12</sup> <https://docs.aws.amazon.com/quickstart/latest/sap-hana/>

<sup>13</sup> <https://docs.aws.amazon.com/AmazonVPC/latest/NetworkAdminGuide/>

<sup>14</sup> [http://docs.aws.amazon.com/AmazonVPC/latest/UserGuide/VPC\\_VPN.html](http://docs.aws.amazon.com/AmazonVPC/latest/UserGuide/VPC_VPN.html)

<sup>15</sup> <https://aws.amazon.com/directconnect/>

<sup>16</sup> <https://do.awsstatic.com/enterprise-marketing/SAP/sap-on-aws-backup-and-recovery-guide-v2-2.pdf>

<sup>17</sup> <https://aws.amazon.com/ec2/purchasing-options/>

<sup>18</sup> <https://aws.amazon.com/sap/solutions/s4hana/>

<sup>19</sup> <https://aws.amazon.com/partners/>