



EBOOK:

VMware Cloud on AWS:

Optimized for the Next-Generation
Hybrid Cloud

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Introduction:

Common Challenges with Hybrid Cloud Adoption

If your organization runs VMware vSphere-based cloud infrastructure in your on-premises data center, but you have been reluctant to migrate applications to the cloud for fear of losing some VMware vSphere-based cloud capabilities, VMware Cloud on AWS solves this problem by seamlessly integrating your familiar VMware virtualization and cloud management tools with Amazon Web Services (AWS). Many organizations believe that moving their applications to the cloud makes it necessary to introduce new tools, skills, and processes. This can present a new set of challenges because learning to use new tools, applying new skills, and adapting to new processes can be costly and time-consuming.

In this section, we dive deeper into how these challenges can hinder hybrid cloud adoption. Later in the eBook, we will cover how VMware Cloud on AWS can help your organization overcome these challenges.

Lack of Workload Portability

In many cases, organizations are reluctant to migrate to the cloud because of uncertainty surrounding workload/application portability and compatibility. There is also uncertainty about whether to move all or some workloads to the cloud. This leaves many organizations desiring a hybrid environment that will enable them to run their applications seamlessly both on-premises and on the cloud. However, this often raises concerns over the complexity of implementing this capability successfully.



Incongruent Networks and Operational Inconsistency

Networking capabilities are an important, fundamental component of a hybrid cloud environment. Connecting an on-premises data center to the cloud often means moving workloads across networks that are incongruent. These incongruent networks often lead to operational inconsistency between the on-premises data center and the cloud environment which can sometimes force organizations to adopt a complex and costly strategy to optimize cloud performance.

Multiple Virtual Machine Formats

Many times, an organization's on-premises environment will use a different virtual machine format and/or hypervisor than the cloud environment they are moving to. Because most companies prefer to continue leveraging their investments in the VMs they have built, this is a common barrier to cloud adoption. If your organization would like to move a workload from one location to another—from an on-premises data center to the cloud, for example—you will often have to deal with a machine conversion issue, and this is typically not a seamless process.

What is VMware Cloud on AWS?

VMware Cloud on AWS makes it seamless for organizations to bring their VMware Software Defined Data Center (SDDC)-based workloads to AWS, delivered as an on-demand service. VMware Cloud on AWS delivers best-in-class hybrid cloud capabilities by integrating the leading private cloud provider, VMware, with the AWS global infrastructure and breadth and depth of services. With VMware Cloud on AWS, you can run VMware's compute, storage, and network virtualization solutions directly on the cloud without giving up any of the functionality, elasticity, or security you've come to expect from AWS. VMware Cloud on AWS provides enterprise-class application performance, reliability, availability, and security by optimizing VMware cloud infrastructure technologies to run on AWS without nested virtualization.

This enables you to run production business critical applications across VMware vSphere-based hybrid cloud environments, with full access to native AWS services and the AWS global infrastructure. Sold, delivered, and supported by VMware as a service, VMware Cloud on AWS can be consumed on an hourly, on-demand basis or through a subscription.

VMware Cloud on AWS enables IT teams to manage their cloud-based resources with familiar VMware compute, storage, and network virtualization products (VMware vSphere, VMware vSAN, and VMware NSX), along with VMware vCenter Server management, eliminating the hassles and overhead of learning new skills or adopting new processes. With the same architecture and operational experience both on-premises and in the public cloud, your organization can now quickly derive instant business value from use of the AWS and VMware hybrid cloud experience.



Customer Benefits of Adopting VMware Cloud on AWS



Leveraging Existing VMware Investments

You can use your existing VMware software licenses to run VMware Cloud on AWS. This helps you maximize the value of your existing VMware investments, allowing you to:

- Deploy a hybrid cloud solution that doesn't require new licenses or hardware
- Limit capital expenses and eliminate complexity as you transition to the cloud
- Minimize the need for staff to adopt new processes or learn new skills
- Predict costs more easily with a simple pricing model and the option of bringing your third-party licenses for simplified compliance



Achieve Operational Consistency

With VMware Cloud on AWS, you can use the same toolset across on-premises and cloud environments, simplifying cloud adoption. VMware Cloud on AWS offers:

- 100% compatibility for existing and new enterprise workloads using VMware
- SDDC licensing, lifecycle management, and support from VMware with one number to call
- A consistent and seamless hybrid IT environment that combines the VMware software with the unmatched functionality, security, and operational expertise of AWS



Powered by AWS

VMware Cloud on AWS brings VMware SDDC to the massively scalable AWS global infrastructure, giving you a simple and consistent way to access the full breadth and depth of AWS services. This hybrid cloud solution:

- Runs directly on the dedicated Nitro-based Amazon Elastic Compute Cloud (EC2) bare metal infrastructure with high bandwidth, advanced security, and low latency
- Gives you access to public API endpoints for AWS services
- Allows you to host private resources in your Amazon Virtual Private Cloud (Amazon VPC) to help you maintain a strong security posture



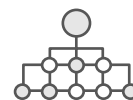
CUSTOMER BENEFITS OF ADOPTING VMWARE CLOUD ON AWS



Integrated with AWS Services

VMware Cloud on AWS is seamlessly integrated with native AWS services, giving you the VMware SDDC experience and access to all of the available AWS offerings. It lets you:

- Run applications on the cloud without expensive re-factoring of code
- Increase the value of your enterprise applications by giving you access to a broad range of AWS services for integrated application modernization
- Capitalize on cloud agility and scale in an operationally consistent and familiar way



Deploy Hybrid Cloud without Complexity

VMware Cloud on AWS eliminates much of the complexity that is typically associated with deploying applications across a hybrid architecture. This enables:

- Bi-directional workload portability between on-premises and the cloud
- Granular VM-level control without having to maintain hardware
- Enterprise-grade security with micro-segmentation and encryption
- Support for your entire environment from VMware, with enabled maintenance windows, service status notifications, as well as scheduled software and site reliability updates
- A flexible consumption model that helps you align your IT spend with your business needs

VMware Cloud on AWS Use Cases

Extend Your Data Center to the Cloud

By extending the capabilities of your on-premises data center to the cloud using VMware Cloud on AWS, you also benefit from on-demand capacity. You can leverage bi-directional workload portability between your on-premises data center and VMware Cloud on AWS, ensuring that you meet dynamic capacity needs for production applications while maintaining one consistent set of policies.

Move Production Applications

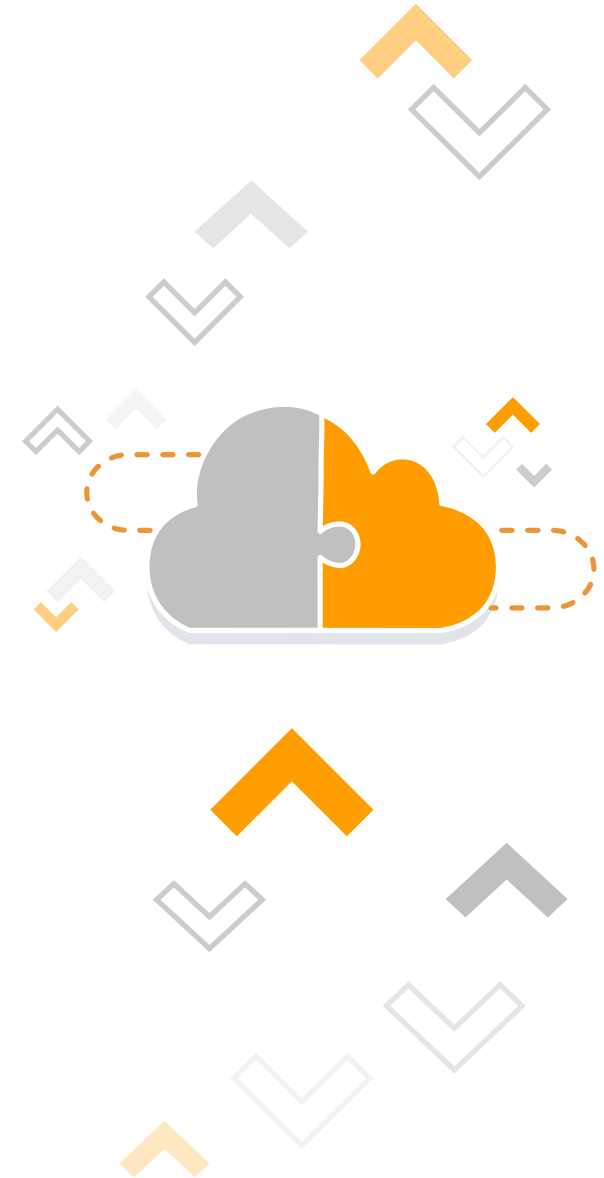
Your production applications can be moved to VMware Cloud on AWS to begin leveraging native AWS services for application modernization and optimization without any complex conversions or the need for re-architecture. Migrate even more rapidly with Hybrid Cloud Extension and AWS Direct Connect, while maintaining optimal levels of performance, scale, and availability required for mission-critical applications. Your VMware SDDC environments run on a high-performance, dedicated, Amazon EC2 bare metal infrastructure to meet the performance and security needs of mission critical production enterprise applications.

Disaster Recovery as a Service

With access to trusted and proven technology such as VMware Site Recovery Manager (SRM) and vSphere Replication for disaster recovery (DR), VMware Cloud on AWS enables faster time to protection than traditional DR solutions. It also helps to lower capital expenditures by eliminating the need for a secondary DR site, streamlines operations with automated orchestration, simplifies and accelerates failover and failback by using familiar management tools, and increases disaster readiness with non-disruptive, on-demand testing available anytime.

Application Development and Test

This hybrid solution is optimized for delivering VMware SDDC-consistent test/dev environments with the ability to integrate with modern CI/CD automation tools. With VMware Cloud on AWS, you can implement an operationally and architecturally consistent test environment, based on the VMware SDDC platform, with vSphere at its core, either on-premises or on the AWS Cloud. VMware Cloud on AWS includes a set of REST-ful APIs; support for leading configuration management tools such as Chef, Puppet, and Ansible; and access to the full set of AWS services for developers.



Technical Components of VMware Cloud on AWS



Compute

With comprehensive, powerful, and highly optimized Amazon EC2 instances running through the VMware vSphere virtualization platform, a scalable, single tenant infrastructure supports 4 to 16 node clusters delivered on dedicated, highly performant, and secure Nitro-based bare metal infrastructure. Additional hosts can be manually added to a VMware Cloud on AWS cluster using the VMware Cloud Portal or programmatically with VMware Elastic Distributed Resource Scheduler (DRS). Each Amazon EC2 node used for VMware Cloud on AWS will be provisioned using a common, familiar format, and will have compute capacity that includes 36 physical cores (pCPUs) and 72 virtual cores (vCPUs) per node, with 512GB RAM and a dedicated host in a minimum 4-node cluster.



Network

VMware Cloud on AWS leverages VMware NSX, the SDDC network virtualization platform that features advanced networking and security services, including switching, routing, firewalling, and load balancing. The host nodes and instances will be supported by robust networking capabilities of VMware Cloud on AWS (10 Gbps+), allowing the interoperability of the nodes to function with very high throughput. This enables you to automate network and security services and policies that are consistent with what you have on-premises, delivered through NSX, with secure connectivity to and from application workloads.

A simple networking mode (Firewall rules, VPN, etc.) for customers who are not familiar with NSX will be available through the VMware Cloud Web Console. An advanced networking mode with full access to NSX functionality will also be available, so if your organization relies on full NSX functionality, you should be aware of the initial “simple mode” limitations.

TECHNICAL COMPONENTS OF VMWARE CLOUD ON AWS



Storage

Proven storage solutions are provided by VMware vSAN, which allows you to leverage zero-click shared storage that is natively integrated with vSphere. All the available storage will be housed on the 16TB of solid state storage available in each node mentioned above, and will operate using vSAN. You can increase storage efficiency and performance with advanced data services, including Quality of Service and snapshots. VMware Cloud on AWS utilizes an “all flash” vSAN storage solution built on low-latency Non-Volatile Memory Express (NVMe)-based instance storage.



vSphere (Management and Virtualization)

VMware vSphere features available within VMware Cloud on AWS include the high availability of vSphere, vMotion, and VMware’s Distributed Resource Scheduler (DRS). Workload portability is delivered through vMotion across hosts within a cluster, as well as VM cold migration and scripted bulk VM migration between your on-premises environment and AWS. The elastic DRS capabilities in VMware Cloud on AWS will make it possible for you to balance workloads across newly provisioned clusters in minutes (not days or weeks), without having to acquire new hardware.

Using VMware Cloud on AWS

Consuming AWS Services

VMware Cloud on AWS is delivered as a service, with AWS managing the physical resources and VMware managing the hypervisor and management components (including monitoring, patching, upgrades, etc.). Your organization manages the VMs and networks. To build your architecture, you will begin by selecting the size of the cluster and the provisioning process will begin. The full VMware Cloud on AWS stack and ESX nodes will be automatically provisioned and configured at launch with a single tenant AWS account that will be owned and operated by VMware. You will be able to designate an existing AWS account, or create a new one, to interoperate with the VMware Cloud on AWS VPC that will be created.

In this section, we will cover some example scenarios that you may encounter once you have connected VMware Cloud on AWS to your existing data center as part of a hybrid architecture.

Migrating a Virtual Machine

You can use vMotion to migrate a VM from an existing data center to VMware Cloud on AWS. To move a VM into VMware Cloud on AWS using AWS Direct Connect, the VM will leave the VLAN and go through the virtual private gateway in the VMware account and end up being routed directly to the ESX that has been set up within VMware Cloud on AWS. These are the same steps you would take with vMotion in an existing data center environment, and is not a new interface or plug-in.

Copying Objects to an Amazon S3 Bucket

For storage, you will be able to copy an object from a VM within VMware Cloud on AWS, and route it directly through a VPC to a separate VPC private endpoint and then to Amazon Simple Storage Service (Amazon S3). This means the packets will never have to go out to the public Internet, following standardized best practices.

Connecting to AWS Managed Services

To connect a VM from VMware Cloud on AWS to an AWS Managed Service, such as an Amazon Redshift cluster, the path is similar to what is described in the paragraph above for storage. The VM will go from the VMware Cloud on AWS VPC to a separate VPC private endpoint and then to Amazon Redshift. This enables you to outsource your data warehouse capabilities, so they do not use excessive resources on your cluster, while also turning them into a managed service.

Connecting to a Web Server

When connecting a web server hosted on a VM in VMware Cloud using public Internet access, you begin by sourcing the traffic from the Internet and connecting that to a VPC within VMware Cloud on AWS. To establish this connection, you will assign an elastic IP to your VMware Cloud on AWS endpoint. The traffic will then be sourced through your gateway to the endpoint and begin communicating with an established NSX Edge node. You will be able to deploy an NSX Edge appliance in your existing, on-premises environment to extend VMware Cloud on AWS to your existing data center.



Getting Started

VMware Cloud on AWS makes it easier for your organization to run VMware workloads on AWS, giving you a simple path to hybrid cloud deployment. Adopting this service will allow your organization to preserve your investments in existing applications, licenses, and processes, while taking advantage of the advanced capabilities that AWS has to offer.

With just a few clicks, you will be able to rapidly provision and scale AWS resources that are operationally consistent with vSphere. VMware Cloud on AWS delivers workload portability powered by the VMware technology in your on-premises data center, combined with the cloud-scale resources and global footprint of AWS. It is truly a next-generation solution that gives you the best of both worlds.

Resources

[Hands on Lab: Getting Started with VMware Cloud on AWS](#)

[AWS: VMware Cloud on AWS](#)

[VMware: VMware Cloud on AWS](#)

About AWS

For 10 years, Amazon Web Services has been the world's most comprehensive and broadly adopted cloud platform. AWS offers more than 90 fully featured services for compute, storage, databases, analytics, mobile, IoT and enterprise applications from 42 Availability Zones (AZs) across 16 geographic regions in the U.S., Australia, Brazil, Canada, China, Germany, India, Ireland, Japan, Korea, Singapore, and the UK. AWS services are trusted by millions of active customers around the world monthly -- including the fastest growing startups, largest enterprises, and leading government agencies -- to power their infrastructure, make them more agile, and lower costs.

To learn more about AWS, visit aws.amazon.com



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