



# The Enterprise Guide to Migrating to the Cloud

Migrate apps to the public cloud  
with Future Ready Cloud Solutions



vmware® CLOUD™

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# 01

## Overview



Enterprises worldwide are competing to develop the most innovative and reliable applications to meet growing customer needs and decrease time to market.

To meet growing consumer expectations, organizations must ensure that business-critical workloads operate in the most optimal, future ready IT environment.

This often means migrating to the cloud to improve agility, lower total cost of ownership (TCO) and accelerate innovation using cloud-native development and automation technology.

Despite the benefits the cloud can bring, many enterprises can face challenges during the migration process. From infrastructure incompatibilities to moving workloads without disrupting tightly bound networks of dependent applications, successful cloud migration requires careful planning.

**In this guide, we'll explore the historical shifts driving cloud migration, the migration challenges enterprises face and how an effective future ready cloud infrastructure can eliminate many of these obstacles.**

# 02

## It Begins with Applications



Applications are a necessity for the modern organization. For a business to provide quality products and services, it needs reliable and user-friendly applications supporting its day-to-day operations.

Knowing this, how can enterprises put themselves in the best possible position to innovate and meet customer expectations? How can they optimize their resources to make application development, implementation and use as effective and efficient as possible, without sacrificing their security or reliability?

To answer these questions, we first need to understand how applications came to revolutionize the way we interact with businesses, organizations and one another.



## The evolution of applications

Applications execute a function, perform a task or range of tasks, and often require user interactivity to do so. An application can be self-contained or designed around a group of programs that consist of a set of operations that runs the application for an end user.<sup>1</sup>

Now many retail transactions take place between a self-checkout kiosk or even an application on a customer's mobile device.

Applications have evolved to a point where they can now provide customers with a service experience on par with or superior to interacting with a human. This was a major turning point for enterprises worldwide.

Consider self-checkout retail stores. Previously, shopping was an interaction between a customer and a store clerk, but now many retail transactions take place between a self-checkout kiosk or even an application on a customer's mobile device.<sup>2</sup>

Today, with the digital transformation occurring across all industries, organizations are increasingly empowered to take care of more of the operational aspects of running a business on their own. As a result, the nature and span of applications have had to evolve to keep up.

<sup>1</sup> TechTarget. "Application." Margaret Rouse. September 2018.

<sup>2</sup> The Wall Street Journal. "Cashierless Stores Make Inroads In U.S." August 12, 2019. .

<sup>3</sup> IDC. "Worldwide Quarterly Converged Systems Tracker Q4 2018." April 2019.

<sup>4</sup> Forrester Consulting and VMware. "The Total Economic Impact of VMware Cloud on AWS." August 2019.

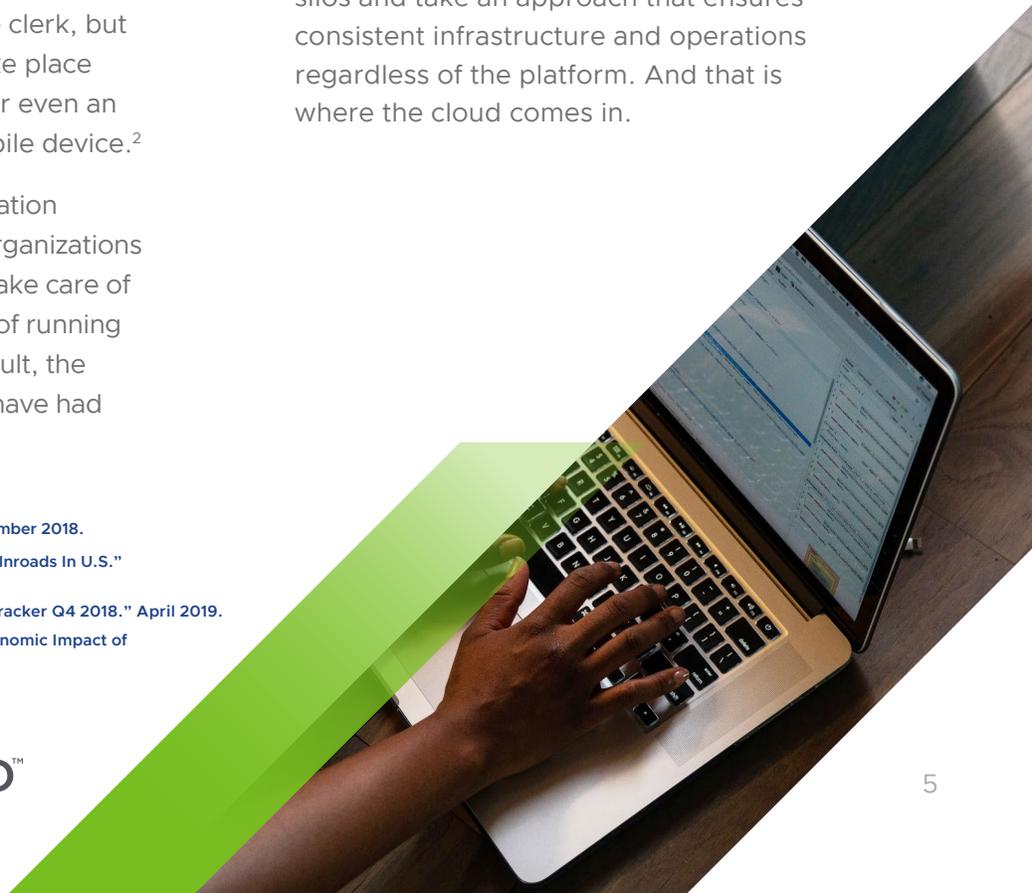
## Application needs drive strategy

Increasingly, applications are deployed and operated across a diverse infrastructure landscape.

With the pressure to deliver goods and services quicker, the increased dependence on applications is accelerating. In fact, more applications are expected to be deployed in the next 5 years than in the last 40 years.<sup>3</sup>

Organizations must decide how to deploy, optimize, manage and support their ever-evolving application portfolio, which drives a set of infrastructure decisions. Organizations are spending \$1 million and countless resource hours to migrate 1,000 virtual machines (VMs) to the cloud.<sup>4</sup>

This is a significant investment to simply rewrite an application for another environment without driving true value and innovation. As a result, organizations need to avoid the creation of infrastructure silos and take an approach that ensures consistent infrastructure and operations regardless of the platform. And that is where the cloud comes in.



## Silver linings: The benefits of cloud migration

The overarching benefit of migrating to the public cloud is the transition from an in-house, capital expenditure model (CapEx) to an outsourced operational expenditure model (OpEx).

In the past, businesses made large CapEx investments in the form of physical data centers, placing these in offices or co-location facilities to support compute, storage and networking needs of their applications.

Rather than rely on in-house data centers, enterprises can now leverage the public cloud as an operational, subscription-based service. The cloud allows them to take advantage of economies of scale, outsource a range of operations and connect to a global network of servers with access to innovative new development services.<sup>5</sup> The cloud is also an important component of app transformation initiatives, enabling organizations to modernize existing apps, integrate with cloud services, convert to cloud native architectures and build additional value into the existing estate of applications.

**This approach has revolutionized IT and business in a number of ways.**



Greater agility

Last century, the average life span for a company was more than 50 years. Today, most S&P 500 companies survive just over 20, with predictions that the life span will shrink to just 12 years by 2027.<sup>6</sup>

Companies need to be able to quickly change tactics, adapt to new environments and develop new ways of thinking to remain relevant. Those that lay down more permanent structures and processes find their investments quickly become obsolete, leaving them lost, confused and unable to keep up.

That's why today, investing in CapEx is considered a risky strategy. It's always possible for a new technological advancement to make an enterprise's fixed asset investment redundant overnight.

An OpEx model reduces this investment risk by allowing enterprises to pay for resources as they go, meaning they won't lose everything if their situation changes.

<sup>5</sup> McKinsey. "The progressive cloud: A new approach to migration." Mark Gu, Krish Krishnakanthan, Anand Mohanrangan and Brent Smolinski. August 2018.

<sup>6</sup> Innosight. "2018 Corporate Longevity Forecast: Creative Destruction is Accelerating." Scott D. Anthony, S. Patrick Viguerie, Evan I. Schwartz and John Van Landeghem. 2018.



## Reduced maintenance and upkeep costs

Companies often fail to look beyond the upfront investment costs of a physical data center to the costs that will accrue over the years.

These costs for ongoing support, maintenance, power, cooling and staffing can be significant. According to Forrester, organizations can reduce their average data center costs by \$1.4 million by leveraging the public cloud.<sup>4</sup>

**The cloud can eliminate these financial pressures due to economies of scale. Public cloud providers are able to reduce their maintenance, upkeep, power, cooling and staffing costs per server unit, compared to a data center run by a private organization.**

These savings can then be passed on to the enterprise, providing a more cost-effective supply of storage, compute and connectivity for their applications.

<sup>4</sup>IDC and VMware. "The Business Value of Hybrid Cloud with VMware." Richard L. Villars and Matthew Marden. August 2019.



## Infrastructure refresh savings

Over time, increased load and decreased efficiency take their toll on data centers just as they do with any machine.

Traditionally, an enterprise would have to refresh their infrastructure—a costly, time-consuming and ongoing process of keeping data center software and hardware up to scratch.

Today, enterprises can instead migrate applications to the cloud at the end of a hardware refresh cycle. Studies by IDC have shown that organizations can reduce their IT infrastructure costs by 26 percent on average by leveraging a cloud infrastructure.<sup>7</sup>





## Efficient and flexible resourcing

Organizations often have to predict how much infrastructure they will use in the future to accurately allot budget and resource requirements. If they invest too little, the business risks providing a slow and unreliable service to customers. The trend has become to purchase too much, with businesses collectively wasting \$62 billion on unused data center capacity every year.<sup>8</sup>

When migrating to the cloud, organizations can take advantage of a flexible pricing model, only paying for the computing resources being used by the applications they have living in the cloud at any given time.

If their product or service takes off, they can simply purchase additional capacity to meet customer demand. If demand subsides, they can then scale their usage down to minimize waste.

## Businesses waste

# \$62

billion on unused data center capacity every year<sup>8</sup>

**Learn more about flexible capacity in the cloud in our *Enterprise Guide to Scaling on Demand*.**



## Additional growth capital

There is a lot of capital tied up in redundant data centers, maintenance and upkeep, and unused capacity. When organizations move to the cloud, they can eliminate the costs associated with managing on-premises infrastructure while only paying for the capacity they need, which presents a significant opportunity for cost saving. These funds could instead be used for revenue-generating activities such as new product development or marketing that could make all the difference to a company striving to stay ahead in today's fiercely competitive marketplace.

<sup>8</sup>DSM. "Typical Data Center Costs for Small Businesses." March 2019.





## Time savings

In addition to the cost-saving benefits, the public cloud promises another key advantage that is very appealing to organizations: savings in time.

By moving workloads from on-premises to the cloud, enterprises outsource a number of their most time-consuming IT management and maintenance activities. IDC found that IT teams are 47 percent more efficient on average with an integrated cloud platform.<sup>7</sup> This frees IT teams to focus on revenue-generating activities, such as developing features, fixes and new innovations, to improve customer experience and gain an edge over competitors.

By the end  
of 2020,

# 85%

of organizations plan to have the majority of their workloads in the cloud.<sup>9</sup>



## Access to cloud services

By migrating applications to the cloud, enterprises gain access to an expansive world of development and management services. This brings benefits from improving application deployment efficiency, to leveraging cloud provider technology, to developing new features.

For example, artificial intelligence and machine learning platforms and business-specific development tools can be used to modernize existing applications and develop next-gen applications to differentiate themselves from their competition.

## The hybrid advantage

More enterprises are realizing the benefits of moving workloads to the cloud. 85 percent of organizations expect to have the majority of their workloads in the cloud by the end of 2020, while up to a quarter of organizations plan to be cloud-only.<sup>9</sup>

<sup>9</sup> AllCloud. "2020 Cloud Infrastructure Report." January 2020.



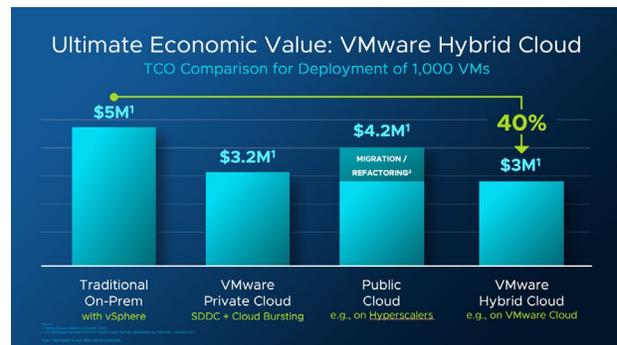
However, relying solely on the public cloud for all workloads isn't the ideal solution for some enterprises. It's sometimes cheaper to maintain applications with specific dependencies on-premises, and many enterprises require specific workloads remain in-house to adhere to compliance and data sovereignty regulations.

The ideal infrastructure for the majority of enterprises is one that includes both environments.

The decision of whether or not to migrate is a strategic one and must be made case by case depending on the cost and complexity of migrating an application or data center, and the benefits achieved once in the cloud.

The ideal infrastructure for the majority of enterprises is one that includes both environments, providing the stability and familiarity of on-premises, while jointly leveraging public cloud services and scalability. This is the hybrid cloud.

Hybrid cloud migration can provide enterprises with significant cost savings, with recent research by the Taneja group showing it's typically 34 percent less expensive than public cloud refactoring.<sup>10</sup>



Want to get started today?



Test drive VMware Cloud™ on AWS with a Hands-on Lab

In the next section, we will explore the challenges enterprises face when migrating to the cloud, and how a seamless hybrid cloud infrastructure can help overcome them.

<sup>10</sup> Taneja Group. "VMware Survey: App Refactoring and Migration to the Cloud Topline Findings." January 2019.

# 03

## Challenges of Migrating to the Cloud



The modern enterprise is under incredible pressure to maintain growth and innovation at an exponential rate. As a result, many have rushed to adopt technologies such as cloud computing without fully understanding or planning for the challenges they will face along the way.

According to McKinsey, “moving applications and data to public-cloud platforms involves working through a formidable set of technology, security, operational, and financial issues.”<sup>5</sup>

The data reflect these difficulties. In a recent survey by Accenture, nearly two-thirds of companies reported they had not achieved the benefits they expected from cloud migration.<sup>11</sup>

<sup>11</sup>Accenture. “Cloud outcomes survey: Expectation vs. reality.” June 6, 2019.



The following outlines the most common pain points enterprises face when migrating, and the approaches they should take to overcome them.



## Incompatible infrastructures between clouds

One of the most commonly cited migration challenges is incompatible and legacy infrastructure, affecting 43 percent of enterprises alongside application sprawl.<sup>11</sup>

Known as lift and shift, many organizations expect they'll be able to move applications built on-premises directly to their cloud environment. However, this strategy is unrealistically simple.

Different environments have different operating systems and different requirements for the applications they house. Often, this approach leads to performance issues or, in worst-case scenarios, the application doesn't work in the new environment at all.



The so-called lift-and-shift method of migrating legacy applications 'as is' to the cloud often doesn't work, because public cloud providers require applications to run in their specific environments.

**KURT SCHERER AND BOB BLACK**

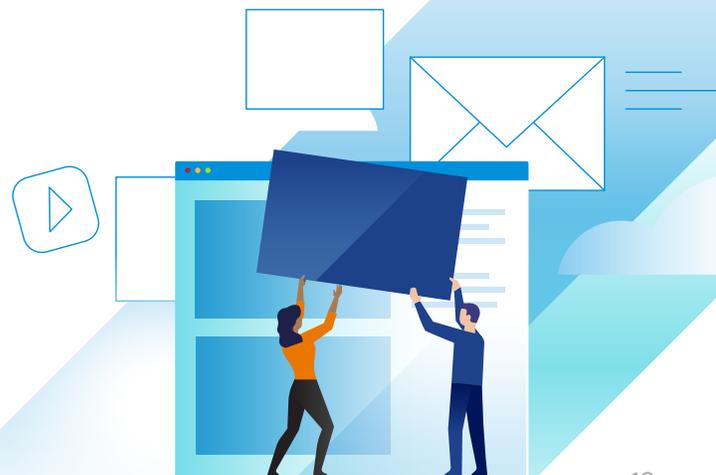
Kurt Scherer, Senior Manager, and Bob Black, Principal, Cloud Infrastructure and Engineering, Deloitte Consulting LLP <sup>12</sup>

# 43%

## of enterprises

cite infrastructure incompatibility and/or application sprawl as a migration challenge.<sup>11</sup>

<sup>12</sup>The Wall Street Journal. "Hybrid Cloud to the Rescue." Kurt Scherer and Bob Black. January 16, 2018.



## Compatibility challenges

- Having limited network integration between on-premises and public cloud environments
- Achieving connectivity between environments for authorization, authentication, usage tracking, cost and performance optimization, automation and process mapping
- Conflicting APIs, policies, UIs and other components
- Maintaining data integration during updates and patches to environments

## Solution

Many cloud solutions require significant investment of time, money and IT resources to ensure applications are compatible across environments. Instead, organizations would benefit from an out-of-the-box service, providing a single, consistent infrastructure across a seamless hybrid environment, removing the compatibility problem.



## Lack of support for security policies

In the early phases of cloud adoption, many organizations were paralyzed by the security implications of moving workloads to the cloud. One of the three phases of cloud adoption, VMware CEO Pat Gelsinger referred to this stage as **cloud paranoia**.

Watch VMware CEO Pat Gelsinger and CloudHealth CEO Tom Axbey discuss the three phases of enterprise cloud adoption: Cloud Paranoia, Cloud Pollyanna and Cloud Pragmatism.



According to a 2018 report by Crowd Research Partners, visibility, compliance and inconsistent policies are the three biggest security challenges enterprises face in the cloud.<sup>13</sup>

<sup>13</sup>Cybersecurity Insiders. "2018 Cloud Security Report." 2018.

Each provider brings its own unique security policies, and these may not align with the policies an organization has established on-premises. This can make migrating challenging, as the security architecture on-premises may not agree with what is running in the cloud.

### Security challenges

- Increased security risk when moving data from one environment to another
- Increased costs and complexity of data encryptions and ownership over encryption keys
- Cloud provider security frameworks that are inadequate for highly regulated industries (e.g. financial services, healthcare)

### Solution

Visibility is fundamental to maintaining consistent security when migrating. By gaining full visibility of their policies from on-premises to the cloud, organizations are able to view and amend inconsistencies. According to Gartner, those enterprises that do implement appropriate visibility and control tools will experience one-third fewer security failures in the coming years.<sup>14</sup>



## Migrating applications with dependencies

Infrastructure, operations and applications form the three key layers organizations must consider when migrating, and dependencies between these layers can cause a range of complications if left unresolved.

For example, migrating an application that relies on operational management by an on-premises system can cause serious performance issues if not planned properly.

Even the challenge of identifying service dependencies and interactions within a containerized environment impacts 46 percent of enterprises.<sup>15</sup> In extreme cases, applications fail to work entirely and have to be brought back to the data center—an expensive and time-consuming operation.

46 percent of companies experience challenges identifying dependencies.<sup>15</sup>

<sup>14</sup> Gartner, Inc. "Is the Cloud Secure?" Kasey Panetta. October 10, 2019.

<sup>15</sup> Dynatrace. "Top challenges for CIOs in a software-driven, hybrid, multi-cloud world." 2019.

## Application dependency challenges

- Lack of clear visibility over data flows between applications
- Latency caused by data transfer between on-premises and cloud-migrated applications
- Ripple effect to interdependent on-premises applications when moving a single application
- Moving the data tier to the cloud or leaving it in the on-premises environment during migration can stop the app performing optimally

## Solution

To avoid dependency issues, enterprises need to visualize how applications interact with their operating systems, infrastructures and one another across all environments.

Ideally, the goal is to minimize compatibility challenges, providing consistency between environments to remove complications caused by dependencies between infrastructure layers, and allowing interdependent applications to transfer data seamlessly once migrated.

According to Tom Nolle of CIMI Corporation, it's all about mapping apps appropriately:

- Create versions of application components. This safeguards enterprises. If they have to roll back, they'll know what other components to roll back to maintain version compatibility.
- Synchronize each app's platform versions. This means changing some platform components, including middleware.
- Make sure that everything that's dependent is recognized, by testing each dependency chain against standard OS and middleware combinations.<sup>16</sup>

Finally, enterprises require the ability to migrate applications in bulk, allowing them to move interdependent applications in concert with zero downtime.

<sup>16</sup> TechTarget. "Map application dependencies to prepare for cloud migration." Tom Nolle. August 13, 2018.



## Cost of refactoring and rewriting applications

Eighty-nine percent of organizations face challenges associated with cost when migrating to the cloud.<sup>15</sup> A lift-and-shift migration often doesn't work and can put application performance at risk. To make on-premises applications work properly in the new environment, organizations often have to modify the code.

One method is refactoring—applying a series of small behavior-preserving transformations to the code that modifies the application over time to make it suitable for the new environment. However, many engineers experienced in on-premises environments aren't proficient with refactoring for the cloud, leaving organizations unable to utilize their in-house talent.

# 89%

of organizations

face challenges associated with cost when migrating to the cloud.<sup>15</sup>

The other commonly used method is to rewrite the code entirely. Each of these methods involve significant investments in time and money on the part of the organization, and this compounds with the number of applications that need modification. In fact, two in every five businesses state application rewriting as their top migration cost.<sup>15</sup>

### Refactoring and rewriting challenges

- Legacy code that doesn't match modern, cloud-based infrastructure environments
- Resource-intensive requirements for updating legacy applications to prepare for migration
- Compounded resource usage depending on the number of incompatible workloads to be migrated

### Solution

Ideally, enterprises require an infrastructure that allows their existing applications to be migrated without modification. With consistent infrastructure and operations from on-premises to the cloud, enterprises would be able to move existing applications without any need for refactoring or rewriting—with the destination environment already set up to support the migrating workloads.



## Lack of strategic planning

The decision of whether or not to migrate to the cloud is a complex one depending on the value of the application, the impact it will have on the business, the cost and complexity of migrating, and the benefits achieved once in the cloud. Despite this, Gartner estimates that less than one-third of enterprises have a documented cloud strategy.<sup>17</sup>



Organizations that do not have a high-level cloud strategy driven by their business strategy will significantly increase their risk of failure and wasted investment.

**DAVID CEARLEY**

Vice President and Gartner Fellow

With the pressure to innovate, it's not surprising that many enterprises rush to migrate without taking the time to look before they leap. The result is that many of these attempts backfire, causing projects to stall or requiring applications to be moved back to their original on-premises environments.

<sup>17</sup> Gartner. "Advance Cloud Technology." 2019.

## Strategic planning challenges

- Failure to develop a clear business case for cloud migration
- Lack of consideration of dependencies between infrastructure, application and operations
- Lack of equal consideration of technical requirements and business needs
- Not researching and understanding the range of application requirements and migration strategies
- Attempting to migrate before testing and learning

## Solution

Developing a comprehensive migration strategy is the best assurance an organization has to ensure their migration will be successful. Businesses should consider everything from desired business outcomes, to investment priorities, deployment models, service providers, talent sourcing and cloud policies.

Many elements of a sound migration strategy depend on organizational structure and culture. Those migrating to the cloud can also put themselves in the best possible position by choosing an experienced cloud provider, and using best-in-class tools to comprehensively map their application data flows and estimate ongoing costs of network egress.



## Skills shortages

With the boom in cloud migration, as many as 90% of organizations face difficulties finding experienced staff in cloud-related disciplines.<sup>18</sup> Attempting to manage the complexities of cloud migration without the right teams in place can open organizations up to additional costs and risks.

### Skills shortage challenges

- Migrations being undertaken without appropriate strategies in place
- Increased security risk in migration due to lack of expertise
- Cost of upskilling staff to learn new tools or environments
- Business leaders circumventing IT in making migration decisions
- Migration process gets delayed with retraining existing staff or hiring of new staff

### Solution

The ideal solution eliminates the need for upskilling or hiring new staff to complete a migration. It is preferential for all organizations to leverage their existing tools and skillsets, allowing their IT team to lend their expertise to the migration process in a cost-effective, timely and efficient manner.

Explore and analyze cognitive biases and risks of cloud adoption, compare the cost-effectiveness of different infrastructure options and decide on which approach is right for you with [The Complete Guide to Cloud Economics](#).

Want to get started today?



Test drive VMware Cloud on AWS with a Hands-on Lab

<sup>18</sup> 451 Research. "2019 Trends in Cloud Transformation." November 2019.



## Migrate and modernize

Modern applications are transforming businesses to deliver improved digital experiences to win, serve and retain customers. These modern applications need to drive business outcomes such as increased business agility, innovation, growth and market differentiation while balancing costs, security, reliability and control.

### Migrate and modernize challenges

However, when customers consider modernization of their existing on-premises applications, some of the key challenges they face include:

- Lack of application portability and interoperability across hybrid environment
- Disparate management tools and security controls
- Multiple operating models and processes across on-premises and cloud environments
- Skill shortage in application development/delivery and infrastructure teams
- Disruption to existing business processes and operations during modernization
- Wastage of current investment while modernizing applications

### Solution

The cloud has played an important role in helping technology teams to not only deliver new applications but also provide an avenue for modernizing existing enterprise applications. VMware Cloud on AWS provides a platform for running our customers' enterprise workloads of today and tomorrow. With VMware Cloud on AWS, customers can run, monitor and manage containers and virtual machines on the same platform using the same tools thereby providing flexibility and simplifying our customers' infrastructure operations. They can start their modernization journey with minimal disruption to their business. They can rapidly migrate their applications to the cloud without downtime. Once in the cloud, they can start transforming these applications by leveraging modern frameworks such as Kubernetes, enriching them with native cloud services and automating the underlying infrastructure operations with DevOps tooling.

# 04 Migrating with VMware Cloud



VMware has developed a portfolio of services that addresses the cloud migration challenges many organizations are facing. With VMware Cloud, enterprises can merge their on-premises environment with the cloud while removing compatibility and consistency challenges.

Consistent operations across environments ensure that established policies and practices for security, automation and governance are preserved, protecting data and applications while minimizing the operational requirements for IT. What's more, the entire cloud solution is built on the most proven and broadly deployed infrastructure portfolio in the world.

vmware® CLOUD™



**VMware Cloud enables consistent infrastructure and consistent operations, employing the same VMware tools and skillsets organizations already use on-premises in the cloud—allowing them to migrate quickly and with zero downtime.**

**This approach provides a best-in-class solution to a range of use cases.**

### Application migration

Accelerate cloud migration without the cost, complexity and risk of refactoring applications by leveraging a consistent, enterprise cloud service.

### Data center consolidation and migration

Implement a rapid and large-scale migration of applications and entire data centers with minimal to no downtime, and no disruption to mission-critical applications such as Oracle, SAP and Microsoft SQL.

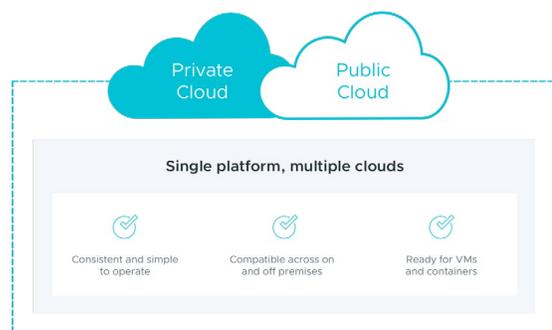
### Cloud-to-cloud migration

Achieve seamless portability between public clouds, while retaining application integrity.

## VMware Cloud Foundation

*VMware Cloud Foundation™* provides organizations with the simplest path to the hybrid cloud by bringing together VMware vSphere®, VMware vSAN™ and VMware NSX® into a natively integrated stack, connecting on- and off-premises data centers with consistent infrastructure and operations.

With integrated cloud infrastructure and cloud management services, VMware Cloud Foundation makes it easy to deploy and run a hybrid cloud, increasing admin productivity and reducing overall TCO.





## Natively integrated software-defined stack

VMware Cloud Foundation provides a complete set of software-defined services for compute, storage, networking and security, and cloud management to run enterprise applications—traditional or containerized—in private or public environments. VMware Cloud Foundation simplifies the path to the hybrid cloud by delivering a single integrated solution that is easy to operate with built-in automated lifecycle management.



## Enterprise-grade functionality

VMware Cloud Foundation is based on VMware market-leading technologies: vSphere, vSAN, NSX and VMware vRealize® Suite, delivering enterprise-ready services for both traditional and containerized applications.



## Storage elasticity and high performance

VMware Cloud Foundation is built on the leading hyperconverged architecture from VMware (vSAN) with all-flash performance and enterprise-class storage services, including deduplication, compression and erasure coding. vSAN delivers elastic storage and drastically simplifies storage management.



## End-to-end security

VMware Cloud Foundation delivers end-to-end security for all applications by providing micro-segmentation; distributed firewalls; VPN (NSX), VM, hypervisor and vMotion® encryption (vSphere); and data at rest, cluster and storage encryption (vSAN).



## Self-driving operations

VMware Cloud Foundation delivers self-driving operations (vRealize Operations™, vRealize Log Insight™) from applications to infrastructure to help organizations plan, manage and scale their software-defined data center (SDDC). Users can perform application-aware monitoring and troubleshooting along with automated and proactive workload management, balancing and remediation.



## Automated infrastructure provisioning

VMware Cloud Foundation automatically deploys all of the building blocks of the SDDC—compute, storage, networking and cloud management—as a ready-to-run workload domain.



## Integrated lifecycle management

VMware Cloud Foundation simplifies and automates patching and upgrading of the full private cloud stack with workload domain-level lifecycle management.

## VMware Cloud on AWS

*VMware Cloud on AWS* bridges the gap between on-premises and the cloud, offering an integrated hybrid cloud that extends on-premises vSphere environments to a VMware SDDC running on AWS elastic, bare-metal infrastructure. This allows users to quickly and confidently migrate applications or entire data centers to AWS—the world’s largest public cloud.



## Migrate without modification

By providing consistent infrastructure and operations, VMware Cloud on AWS allows organizations to migrate applications easily using familiar VMware technologies.

VMware Cloud on AWS provides a single inventory view of both on-premises and VMware Cloud on AWS resources using VMware vCenter Server® technology. Organizations can also reduce operational overhead by leveraging existing skills, tools, processes and familiar VMware technologies to move their applications to the public cloud.

Customers no longer have to worry about applications with significant customization or complex dependencies on existing infrastructures, or the cost and effort associated with refactoring or rewriting applications.

Using VMware Cloud on AWS is made even easier by the broad range of third-party technology solution providers validated to work with the service.



## Enterprise-grade capabilities

With VMware Cloud on AWS, enterprises are able to leverage predictable, high-performance compute, storage and networking—delivered by vSphere, vSAN and NSX—running on Amazon EC2 elastic, bare-metal infrastructure.

In addition to a range of capabilities that ensure application uptime, prevent the lateral spread of threats and secure data, the service enables automatic scaling and load balancing of environments with Elastic DRS.

Uptime is ensured throughout the application with built-in capabilities for VMware HCX®, vSphere High Availability, vSphere Distributed Resource Scheduler™, auto host remediation and Stretched Clusters for zero-recovery point objective (RPO) infrastructure availability.



## Access cloud-native services

VMware Cloud on AWS provides high bandwidth, low latency access to a broad range of AWS services, including storage, database and analytics, serverless, compute, networking, security, IoT, machine learning and more.

It allows you to extend the value of enterprise applications running in VMware Cloud on AWS by providing enterprises with a simple and consistent way to access native AWS services. By seamlessly integrating with these innovative native AWS services, customers can incrementally add new features to their applications and enhance the end use experience.



## Comprehensive support

With a comprehensive support service, users can leverage a single point of contact for all their support issues. The service also updates automatically, allowing users to focus on applications while VMware and its partners take care of infrastructure patches and upgrades.

Additionally, VMware Cloud on AWS provides a unified support experience with intelligent search, chat support, service request management, service health and community help.





## Flexible consumption

Using this service, organizations can align costs to their business needs with flexible consumption options and investment protection. They can consume on demand hourly, or take advantage of one-year and three-year reserved models for deeper discounts.

VMware Cloud on AWS also includes rapid provisioning, enabling users to spin up entire VMware SDDC environments in two hours and add or remove hosts in minutes, or let Elastic DRS do the job automatically based on optimal utilization.



VMware Cloud on AWS helps us build on our success with VMware in our private, on-premises environment and cost effectively extend services to a global hybrid cloud.

**BEN TANNER**

Director of Cloud Enablement, IHS Markit



IHS Markit

## VMware HCX

*VMware HCX* enables organizations to move applications seamlessly between environments at scale, accelerating workload migration by as much as 10x and reducing downtime by 90 percent.

Organizations can leverage the service to maintain business continuity while migrating, and lower TCO by conducting large-scale migrations across a seamless hybrid cloud infrastructure.



## Multi-cloud application mobility

VMware HCX enables organizations to transform their data center with secure, seamless application mobility between vSphere 5.0+ on-premises environments and the cloud without upgrading their vSphere version. Enable zero-downtime live migrations and scheduled, low-downtime, large-scale migrations. Multiple VM migration models (including vMotion, live, warm, cold) make it easy.



## Infrastructure hybridity

VMware HCX enables seamless and secure cloud onboarding with secure proxy for vMotion; secure network extension; and high-throughput, WAN-optimized, load-balanced, multisite bidirectional interconnects.



## Disaster recovery

In the event of a disaster, organizations can use VMware HCX to recover their networking layer, while maintaining their traffic routes, allowing for high-speed disaster recovery with low downtime. Organizations can also use HCX to avoid anticipated disasters, migrating SDDCs from disaster zones to safe locations when disaster warnings are received.

Organizations can protect workloads by replicating data to a VMware Cloud Provider™, enabling partial or full-site recovery. If disaster recovery is invoked, there is no reconfiguration of IPs, reducing complexity and allowing for faster recovery.



Since moving to VMware Cloud, I'm worrying less about operational uptime. There is a certainty, an assurance that everything works. Also, we feel we're at the forefront of technology. There are additional features coming online every month.

**SAM AKROYD**

Technical Services Manager, Stagecoach

## VMware Cloud Provider Program

Partnering with one of the more than 4,600 VMware Cloud Providers worldwide helps organizations drive their digital transformation with cloud services based on trusted VMware technology, designed to reduce the complexity of migration.

VMware Cloud Providers enable organizations to run, manage, connect and secure their entire application portfolio on any cloud, to any device. Migrating to the cloud with a VMware Cloud Provider holds a number of benefits for organizations.



## Seamless hybrid cloud

Enterprises benefit from agility, efficiency and savings of a public cloud that leverages their on-premises technology and investments to unlock enterprise-grade networking, security and availability—enabling unparalleled compatibility.



## Assured service

Organizations can streamline cloud management and ensure security for their corporate IP with cloud providers that maintain the specific standards and compliance certifications required across a range of industries.



### Data sovereignty

With a network of cloud providers located across more than 100 countries, organizations can easily keep data and applications local for simplified adherence to national data security and privacy regulations.



### Flexibility and choice

Organizations can count on their cloud provider as a trusted advisor to extend their IT to the cloud, enabling them to focus on business. With more than 4,000 providers to choose from, enterprises are sure to find the specialized services to meet their unique business needs.

## VMware Network Insight

*VMware Network Insight™ is one of the key products in the VMware Cloud portfolio, not only simplifying cloud migration, but also enhancing network and security capabilities.*

Deployed on-premises or accessed as a service, enterprises can use Network Insight to map and analyze traffic flows, plan security and troubleshoot network issues across all virtual, physical and public cloud environments.



### Plan application security and migration

With the ability to troubleshoot security for SDDC, native AWS and hybrid applications, Network Insight allows organizations to reduce risk by securing their application infrastructure and determining dependencies before migrating.



### Optimize and troubleshoot networks

Organizations can reduce the mean time to resolution for application connectivity issues, optimize application performance by eliminating network bottlenecks, and audit network and security changes over time.



### Manage and scale NSX

Network Insight enables organizations to scale across multiple NSX Managers, boost uptime by proactively detecting misconfiguration errors, and ensure compliance for NSX.

## Want to get started today?



**Test drive VMware Cloud on AWS with a Hands-on Lab**



**Jump-start VMware Cloud on AWS with a single host**

# 05 A Simple Solution

“How do we take the first step?” That’s the most common question organizations ask about cloud migration, according to AWS Enterprise Strategist Ishit Vachhrajani.<sup>19</sup> With technology leveling the playing field for companies of all sizes, there’s no time to hesitate.

As the world becomes increasingly variable and complex, organizations need to reduce the complexity and effort involved in their processes. An organization won’t stand a chance innovating against lean start-ups if it is stuck trying to overcome compatibility challenges or navigate application dependencies without the right tools.

The solution to achieving this simplicity is to implement a seamless, future ready hybrid cloud environment. With familiar, integrated tools and systems, enterprises can migrate single applications or entire data centers to the cloud, providing the time and resources to focus on what’s important—developing innovative, useful new products.

Migrating to the cloud doesn’t have to be difficult. Organizations that choose to leverage seamless hybrid infrastructure get all the benefits of the cloud, without the interoperability, dependency and cost challenges that cause so many to flounder and stall.

Try our [hands-on lab](#) today to experience how a VMware Cloud on AWS SDDC environment works by practicing basic tasks.

<sup>19</sup> AWS. “Bias for action – Take the first step.” Ishit Vachhrajani. July 30, 2019.

