



Sponsored by: **VMware**

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Business Value Highlights:

Migration efficiencies versus other public cloud:

57%

lower overall cost to migrate equivalent

59%

less staff time

46%

faster to migrate

Value of running applications on VMware Cloud on AWS in VMware hybrid cloud environment:

351%

three-year ROI

83%

less unplanned downtime

The Business Value of Running Applications on VMware Cloud on AWS in VMware Hybrid Cloud Environments

EXECUTIVE SUMMARY

In the next two years, the majority of an enterprise's products and services will be digital or digitally delivered, increasing the reliance on digital infrastructure to support traditional business applications and the new digital services used to deliver customer/workforce experiences and intelligent business operational systems. By the end of 2021, based on lessons learned in the pandemic, most enterprises will put a mechanism in place to accelerate their shift to cloud-centric digital infrastructure twice as fast as before the pandemic.

For all organizations, hybrid cloud, with workloads deployed across public cloud and dedicated infrastructure, will be the de facto IT environment. But transitioning to and taking full advantage of resources in a hybrid cloud environment are not without challenges. IDC research highlights that inconsistent operational workflows and limited transferability of skill sets continue to be challenges to effective movement of applications and ongoing operation of hybrid cloud environments. VMware Cloud on Amazon Web Services (AWS) is designed to address this consistency gap by delivering a public cloud environment that is consistent with and manageable by the familiar VMware tools and workflows that are used in many private cloud environments. Its use can ease faster adoption of cloud while lowering operating costs and boosting business value for enterprises.

IDC interviewed organizations about the impact of running applications on VMware Cloud on AWS in VMware-based hybrid cloud environments. Study participants cited strong value in terms of both the ability to efficiently migrate workloads to the public cloud and optimization of their infrastructure performance, agility, and cost. Interviewed organizations linked significant migration-related efficiencies to their ability with VMware Cloud on AWS to leverage existing VMware technologies, knowledge, and best practices. As a result, they completed migrations faster, with less risk, and at much lower cost, resulting in both cost savings and earlier recognition of benefits related to their use of public cloud infrastructure resources.

27%

improved application performance

\$6.56 million

higher revenue per organization per year

44%

lower three-year cost of operations

48%

more efficient IT infrastructure teams

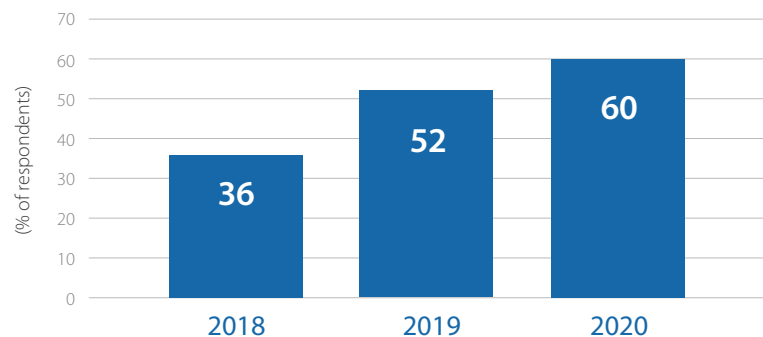
In addition, study participants have recorded important improvements in terms of infrastructure availability, performance, and staff time requirements by running workloads on VMware Cloud on AWS. This means that, compared with running the same workloads in an on-premises or private cloud environment, they can better support their businesses at a lower total cost. Based on interviews with VMware customers, IDC puts the value they will achieve at an annual average of \$895,400 per 100 virtual machines (VMs), or \$4.49 million per organization, by:

- **Reducing the frequency and duration of unplanned outages**, which minimizes costs related to lost productivity and revenue
- **Empowering the business through agility, scalability, and performance**, helping address business opportunities and increase revenue
- **Requiring less staff time to manage, secure, and support infrastructure environments**, thus freeing up IT teams to work on other initiatives and support business growth
- **Enabling more efficient use of infrastructure resources**, thereby reducing costs for running similar workloads and applications

SITUATION OVERVIEW

Organizations have largely recognized and accepted the value of leveraging a mix of public and dedicated infrastructure resources for their application needs. The mix of resources in hybrid cloud environments enables the optimal use of infrastructure resources for each workload and use case, delivering flexibility, resilience, and control as needed. IDC's *IaaSView Survey* highlights the steady growth of hybrid cloud usage among enterprises, with 60% of respondents reporting actively using some kind of hybrid cloud environment in 2020, up from 36% in 2018. Figure 1 shows this increase in hybrid cloud prevalence.

FIGURE 1 Growth of Hybrid Cloud Environments, 2018–2020

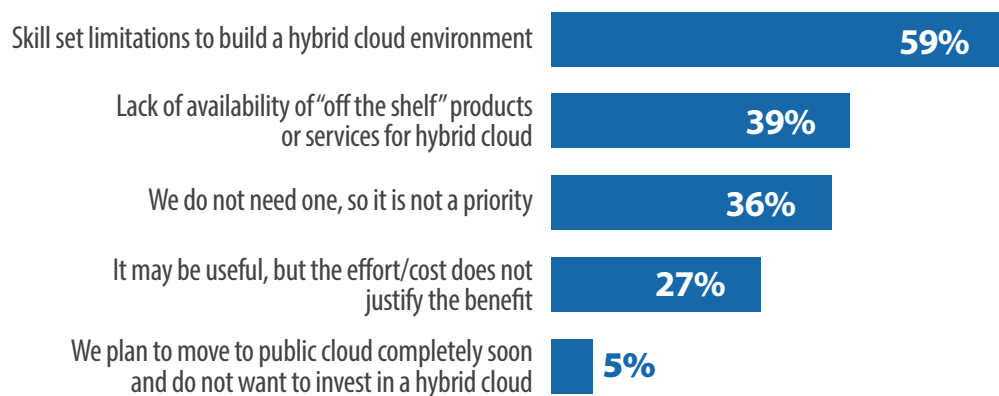


n = 1,500 Source: IDC's IaaSView Survey, 2018, 2019, and 2020

But adoption of a hybrid cloud strategy often requires more than just using a mix of resources across public cloud and dedicated infrastructure. Public cloud infrastructure environments are different from typical on-premises environments in terms of the types and geographic availability of resources, the management tools that can be used, and the skill sets required to effectively operate the environment. For enterprises that have an extensive set of workloads, these differences translate into cost, effort, and risk to the IT organization, reducing the benefits delivered to the organization from a hybrid cloud approach. In many cases, they prevent an organization from adopting a hybrid cloud approach at all.

Figure 2 highlights the top reasons reported by respondents to IDC's 2020 IaaSView Survey as to why they do not yet pursue a hybrid cloud approach for infrastructure needs. Limitations in skill sets and lack of availability of ready-to-use products and services for hybrid cloud are seen as the two top reasons preventing broader adoption of hybrid cloud.

FIGURE 2 Obstacles to a Successful Hybrid Cloud Implementation, 2020



n = 242 Source: IDC's IaaSView Survey, 2020 (% of respondents)

Responding to the growing demand among enterprises to leverage highly interoperable hybrid cloud environments must be a priority for technology vendors. As the most commonly implemented IT infrastructure environment at enterprises, the VMware environment can be a critical component in this transition. Extending the VMware tools and experience into public cloud through software suite enhancements, cloud provider partnerships, and the VMware-delivered VMware Cloud on AWS has been and remains a priority for VMware.

VMWARE HYBRID CLOUD WITH VMWARE CLOUD ON AWS

VMware Cloud on AWS offers customers a ready-to-use VMware environment, completely managed and delivered as a service by VMware, within the Amazon Web Services public cloud. VMware Cloud on AWS is a VMware Cloud Foundation (VCF) cloud environment, which includes vSphere, vSAN, and NSX, built on Amazon EC2 bare metal servers. Customers can provision virtual machines and manage their infrastructures on VMware Cloud on AWS using the same VMware tools and processes workflows that are used for the rest of their VMware environment. This includes access to services such as vSphere HA for high-availability workloads, vSphere vMotion to move workloads to and from a VMware Cloud on AWS environment, and NSX networking to build a common private network across deployments.

The VMware Cloud on AWS is built with a deep level of technical integration across the VMware and Amazon Virtual Private Cloud (VPC) networking, allowing customer VMs within VMware Cloud on AWS to be on the same private network as Amazon EC2 instances and other AWS services launched within the customer's Amazon VPC. Customers can thus easily provision and use AWS public cloud services such as databases and analytics services alongside their VMware environment. Customers can also add and remove hosts on demand and benefit from the flexibility and agility benefits of public cloud. Key customer benefits delivered by VMware Cloud on AWS are:

- Access to a public cloud environment that is consistent with an on-premises environment and can be operated with the same tools and skill sets as customers' on-premises VMware environments, allowing easy migration, operations, and integration with customers' on-premises environments
- Ability to add or remove resources on demand within minutes and use resources with hourly pay-as-you-go pricing, enabling agility and flexibility with customers' VMware environments
- Access to AWS public cloud services, including databases, data analytics services, and emerging technologies such as artificial intelligence/machine learning (AI/ML)
- Delivered as a completely managed service by VMware, with pay-as-you-go pricing and no up-front commitments

VMware Cloud on AWS is also expected to be available soon with AWS Outposts. VMware Cloud on AWS Outposts will allow customers to access all the joint benefits discussed in this

study, with the added flexibility to deploy and deliver these services at customer-selected premises. VMware Cloud on AWS was launched in 2017 and is now available in over 15 AWS regions worldwide.

THE BUSINESS VALUE OF RUNNING APPLICATIONS ON VMWARE CLOUD ON AWS IN VMWARE HYBRID CLOUD ENVIRONMENTS

Study Demographics

IDC conducted research that explored the value and benefits for organizations in running important business applications on VMware Cloud on AWS in VMware hybrid cloud environments. The project included 10 interviews with individuals at organizations with experience and knowledge about the benefits and costs of using this solution set. The interviews covered a variety of quantitative and qualitative questions about the impact on their IT operations, costs, and business results.

Table 1 presents study demographics for interviewed organizations. The scale of their business operations is reflected in an average employee base of 46,685 and average annual revenue of \$14.7 billion. These United States-based companies spanned verticals that included healthcare (2), professional services (2), retail (2), securities and investment services (2), government, and telecommunications.

TABLE 1 Demographics of Interviewed Organizations

	Average	Median
Number of employees	46,685	550–257,000
Number of IT staff	3,839	12–22,500
Number of business applications	4,857	12–25,000
Revenue per year	\$14.72 billion	\$140 million to \$115.6 billion
Country	United States	
Industry	Healthcare (2), professional services (2), retail (2), securities and investment services (2), government, and telecommunications	

n = 10 Source: IDC, 2020

Choice and Use of VMware Cloud on AWS for VMware Hybrid Cloud

Interviewed organizations discussed the rationale behind their decisions to create VMware-based hybrid clouds with VMware Cloud on AWS. Most organizations cited not only the ability to continue to leverage VMware-based solutions but also the quality and functionality of VMware Cloud on AWS as a public cloud solution as foundational to their decisions.

Interviewed organizations described arriving at the decision that they needed to leverage the scalability and flexibility of the public cloud but wanting to do so in an efficient, low-risk, and nondisruptive way. To accomplish these objectives, they chose to build out hybrid cloud environments that included on-premises and private cloud environments running on VMware software, as well as moving and deploying applications to the public cloud. Several interviewed organizations noted the core advantages of establishing this type of hybrid cloud environment in terms of scalability and flexibility:

- **Allows access to cloud scalability:** *“Having a hybrid cloud with VMware is definitely of great benefit to us ... We’re realizing that we want to be in a cloud environment with the ability to scale storage and compute resources.”*
- **Flexibility to support the business:** *“Having a hybrid system with VMware gives us flexibility. We’re never going to experience a situation where we don’t have storage space for our information.”*

With the decision to create a hybrid cloud environment in place, study participants then made the decision to use VMware Cloud on AWS as the public cloud component of these hybrid clouds. However, establishing this type of hybrid cloud entails specific challenges, including needing to minimize the costs and risk related to migrating workloads to the public cloud. Study participants chose VMware Cloud on AWS in significant part because of the ease of multidirectional workload migration between their on-premises VMware environments and the AWS cloud. The ability to continue to use the same VMware technologies that IT team members were already familiar with was an important consideration for many companies. This meant that staff knowledge could be reused for setting up and migrating storage and compute resources, and it also minimized the time and expense associated with training. Moreover, the existing knowledge and understanding of VMware technologies help ease the time and risk related to migrations, reducing costs and the possibility of potential business interruptions. Study participants explained these considerations:

- **Ease of moving workloads between on-premises and AWS cloud:** *“VMware Cloud on AWS allows us to use the same technologies that we’re using for our on-premises environment and be able to flip workloads back and forth between our on-premises environment and AWS.”*

- **Comfort with VMware technology but in AWS cloud:** *"We were already using VMware, and one of the ways that we evaluated VMware Cloud on AWS was to assess the features and security that VMware already had in place and how did that translate back to Amazon."*
- **Ability to create hybrid cloud with the same tools and technological foundation:** *"We love the fact that VMware Cloud on AWS is still VMware and it uses all the same tools ... It's core to our strategy, and we wouldn't be doing hybrid cloud if it weren't for VMware Cloud on AWS."*

IDC gathered data that provides a snapshot of how interviewed organizations are using VMware Cloud on AWS. On average, applications running on VMware Cloud on AWS constituted more than one-third of total workloads (35%) running in their VMware hybrid cloud environments, reflecting substantial migrations of applications to VMware Cloud on AWS. Most of these workloads were migrated from on-premises and/or private cloud VMware environments.

Table 2 provides additional data points on VMware Cloud on AWS use by interviewed organizations. On average, they reported running 236 business applications supporting 8,741 users of those applications. These applications were running on an average of 502 VMs with 142TB of data.

TABLE 2 VMware Cloud on AWS Environments, Interviewed Organizations

	Average	Range
Number of virtual instances/VMs	502	3–1,500
Number of business applications	236	3–1,500
Number of terabytes	142	15–650
Number of users of applications	8,741	95–40,200

n = 10 Source: IDC, 2020

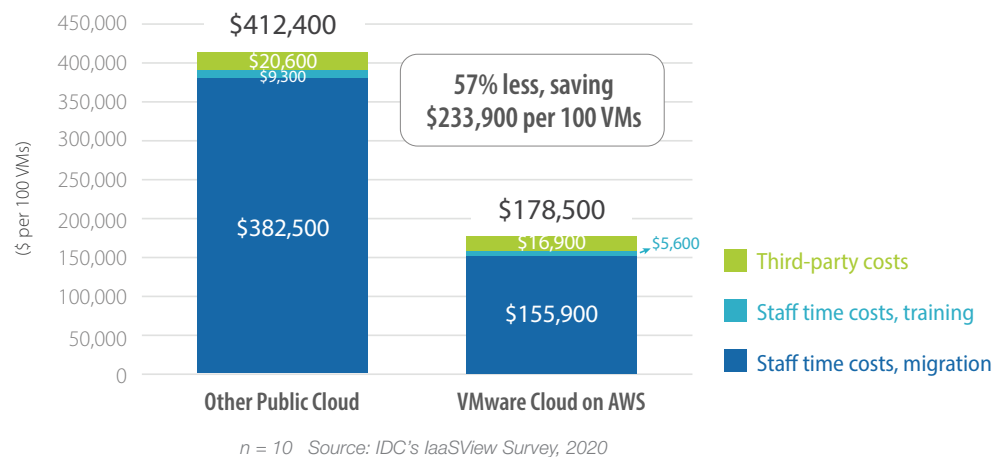
The Value of Migration Efficiencies with VMware Cloud on AWS

VMware Cloud on AWS integrates VMware compute, storage, and network virtualization products and services and optimizes them to run on dedicated AWS infrastructure. A core value proposition of VMware Cloud on AWS is that it is designed to optimize migration of applications and workloads from other VMware-based environments. Interviewed organizations confirmed that they were able to complete workload migrations to VMware

Cloud on AWS faster and with less staff time required than they would have needed to migrate to another public cloud environment. They linked these efficiencies to automation, tools, leveraging existing staff technological knowledge, and avoiding the need to train and upskill IT staff to execute migrations:

- **Ease and efficiencies in migrating workloads:** *"Efficiencies in migrating was a huge consideration for us because we had to do a major transition ... Transitions only take a few hours to change the operating environment as compared with weeks or months otherwise."*
- **Minimizing challenges of migration to native cloud:** *"The VMware product is great because it lets you automate migrations. We were able to move VMs from our colocation and turn them back on, change their IP addresses, and they were quickly back in production."*
- **Faster migration using governance and tools:** *"It would take around 25% more time to complete a hybrid migration to the cloud without the VMware hybrid tools. The first reason was tougher criteria to pass with governance if we did it on our own. The second was the need to prove the tools through proof of concept, whereas with VMware, we already have the tools."*
- **Less training required because of VMware technology foundation:** *"We're saving on training costs with VMware Cloud on AWS because it's VMware technology. We don't have to add a technology on top of it because we already know the technology."*

IDC evaluated the different costs that organizations incur in migrating workloads to the public cloud, including staff time, third-party costs, and staff training requirements. Figure 3 confirms that study participants have benefited from strong efficiencies in migrating workloads to VMware Cloud on AWS compared with other public cloud options. IDC calculates that, on average, organizations incurred total migration-related costs that were 57% lower than those of another public cloud solution, including needing 59% less staff time. Combined, these efficiencies and cost savings translated into average savings of \$233,900 per 100 VMs, reflecting a much lower cost of migrating workloads to the public cloud.

FIGURE 3 Cost to Migrate to VMware Hybrid Cloud Versus Other Public Cloud Alternative

More efficient and timely migration of workloads to the public cloud with VMware Cloud on AWS resulted in not only lower costs but also earlier recognition of the benefits of running workloads on a robust public cloud infrastructure. IDC's analysis of the ongoing value of running applications on VMware Cloud on AWS demonstrated incremental business-related value in areas such as:

- Increasing developer productivity levels
- Reducing productivity and revenue losses related to unplanned downtime
- Winning more revenue

Completing faster migrations to the public cloud with VMware Cloud on AWS — 46% faster or 4.5 months earlier on average — helped interviewed organizations start realizing the benefits of public cloud adoption at an earlier time, allowing them to capture these productivity- and business-related benefits sooner. As shown in Table 3, IDC calculated the total value of productivity and business gains from faster migration at an average of \$208,100 per 100 VMs. This means that the overall benefit of faster migration with VMware Cloud on AWS compared with other public cloud options was calculated at \$442,000 per 100 VMs, including both migration-related cost savings and business-related gains.

TABLE 3 Potential Total Benefits of Faster Migration with VMware Cloud on AWS

Value Gained with VMware Cloud on AWS	Per Organization	Per 100 VMs
Additional time to migrate (total)	4.5 months (46% faster)	0.9 months (46% faster)
Value of higher developer productivity	\$45,900	\$9,100
Value of higher recognized revenue	\$366,700	\$73,100
Value of reducing lost productivity, unplanned downtime	\$438,500	\$87,400
Value of reducing lost revenue, unplanned downtime	\$192,900	\$38,400
Value of productivity and business gains from faster migration	\$1.04 million	\$208,100
Value of migration-related time and cost savings from faster migration	\$1.17 million	\$233,900
Total value of faster migration	\$2.21 million	\$442,000

n = 10 Source: IDC, 2020

The Business Value of Running Applications on VMware Cloud on AWS

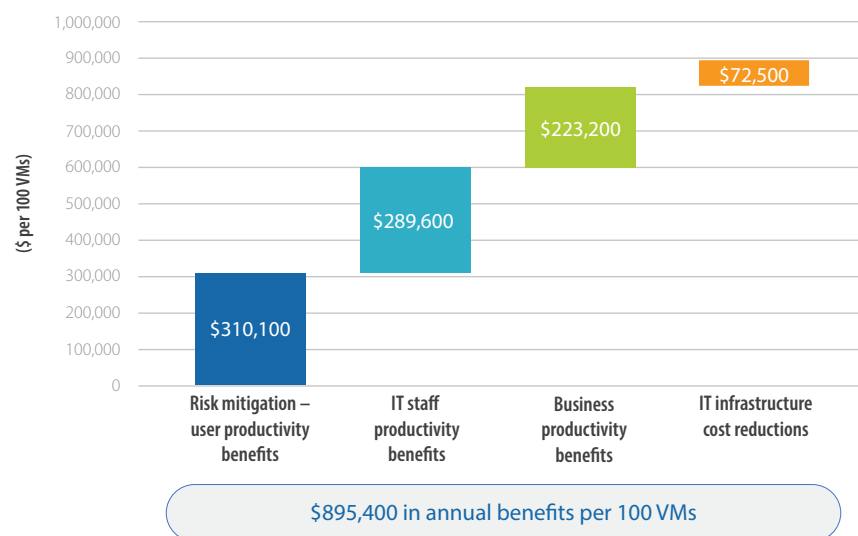
In addition to migration-related efficiencies and benefits, interviewed organizations also attributed significant ongoing value to running applications on VMware Cloud on AWS in the context of a VMware-based hybrid cloud environment. Study participants linked their use of VMware Cloud on AWS to higher reliability, increased flexibility, improved performance, and lower costs. Interviewed VMware customers spoke of these advantages of VMware Cloud on AWS:

- Cost, reliability, and security:** *“VMware Cloud on AWS fits well within our cloud strategy. It saves us money and reduces downtime, which are both huge for us. Also, having a VMware hybrid cloud doesn’t compromise security. Those were really the three big things for us.”*
- Scalability to handle data-heavy workloads:** *“VMware Cloud on AWS allows us to either move or increase our footprint whenever we need to, especially if we’re leveraging a large data set. It’s great to be able to either move the whole workload to VMware Cloud on AWS or add additional VMs ... VMware Cloud on AWS is probably one of the more strategic pieces of what we are doing.”*

Based on interviews with VMware customers, IDC calculates that they will achieve value worth an annual average of \$895,400 per 100 VMs (\$4.49 million per organization) in the following areas (see Figure 4):

- **Risk mitigation — user productivity benefits:** Study participants have reduced the cost of lost employee productivity and revenue caused by unplanned outages. IDC calculates that these organizations will see benefits worth an average of \$310,100 per 100 VMs (\$1.56 million per organization) in higher productivity and revenue.
- **IT staff productivity benefits:** Study participants have leveraged the ease of use, strong performance, and embedded functionality of VMware Cloud on AWS to minimize day-to-day work for IT infrastructure, security, help desk, and application development teams. As a result, IDC projects that these organizations will realize staff time savings and productivity gains worth an average of \$289,600 per 100 VMs per year (\$1.45 million per organization).
- **Business productivity benefits:** Study participants empower their business activities with greater flexibility and improved performance, helping keep existing customers and win new business opportunities. IDC puts the value of higher revenue at an annual average of \$223,200 per 100 VMs (\$1.12 million per organization).
- **IT infrastructure cost reductions:** Study participants avoid needing to extend or replace on-premises infrastructure and can use flexible consumption offerings to optimize IT infrastructure costs. IDC estimates that these organizations will save an average of \$72,500 per 100 VMs per year (\$0.36 million per organization).

FIGURE 4 Average Annual Benefits per 100 VMs



n = 10 Source: IDC's IaaSView Survey, 2020

Improved Performance and Reliability

Interviewed organizations reported that they benefited by running applications on VMware Cloud on AWS from improved infrastructure performance, reliability, and availability. By upgrading to VMware Cloud on AWS, they gained from having more resilient and agile infrastructure; one significant impact is limiting the impact of unplanned outages on business-critical applications and ultimately business results. As one study participant noted: *“VMware Cloud on AWS has made us more agile and reduced our risk because we have distributed sites. Previously, if something went wrong on one site, we couldn’t see it because we didn’t have the needed transparency. This meant that the number of downtime events used to be a lot higher.”* The adoption of VMware Cloud on AWS opened up access to the tools and capabilities of the platform, as well as operational expertise from VMware and AWS that organizations may struggle to replicate with their in-house IT staffs.

Table 4 quantifies these benefits related to unplanned outages. As shown in Table 4, the number of unplanned outages per year was significantly reduced (65%), while mean time to repair (MTTR) remediation efforts took 52% less time to complete. This means that, overall, business end users experience an 83% reduction in the annual number of hours lost to unplanned downtime events and disruptions (3.6 fewer lost hours of productivity per user per year). IDC calculated the annual productivity gains related to minimizing unplanned downtime at \$1.18 million per organization with VMware Cloud on AWS.

TABLE 4 Impact on Unplanned Downtime

	Previous Environment	With VMware Cloud on AWS	Difference	Benefit with VMware Cloud on AWS (%)
Number of unplanned outages per year	3.5	1.2	2.3	65
MTTR (hours)	7.3	3.5	3.8	52
Hours of lost productivity per user per year	4.3	0.7	3.6	83
Value of lost productive time per organization per year (FTEs)	20.2	3.4	16.8	83
Value of lost productive time per organization per year	\$1.41 million	\$0.23 million	\$1.18 million	83

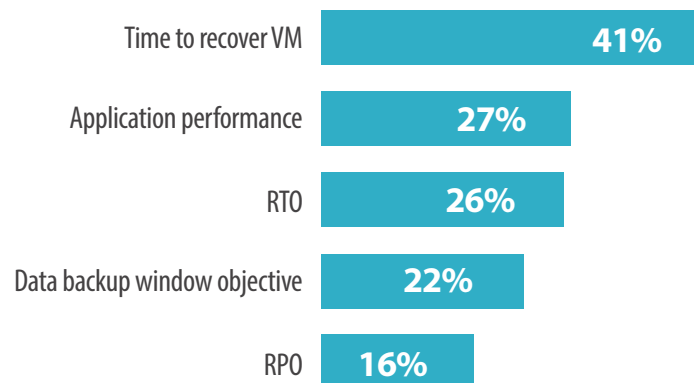
n = 10 Source: IDC, 2020

Study participants further linked their use of VMware Cloud on AWS to improvements in application performance and risk-related metrics. These improvements not only provide a better experience for application users — potentially increasing their productivity levels — but also minimize risk related to data and applications being used on a day-to-day basis. As one study participant noted: *“Our users are seeing higher performance with VMware Cloud on AWS,*

and they're getting more information delivered at the speed that they need. Because we're operating a medical facility, we need speed, performance, and security, especially when moving data from one location to another. Our users are 10% more productive on average as a result."

Figure 5 provides data for each of the aforementioned KPIs, including improvements in time to recover VMs (41%), application performance (27%), and RTO (26%).

FIGURE 5 Impact on Performance- and Risk-Related Metrics



n = 10 Source: IDC, 2020 (% improvement)

Improved Agility

Study participants reported that by using VMware Cloud on AWS, they have greatly improved the overall agility with which their IT organizations can serve their businesses. In particular, self-service functionality across dedicated on-premises and cloud environments ensures consistent deployment of resources and migration of applications to enable optimal response to changing business requirements. With VMware Cloud on AWS, study participants reported being able to deploy new VMs 66% faster, contributing to 14% higher productivity for application development teams. As one study participant noted: *"We are absolutely more agile with VMware Cloud on AWS. We can stand up as many machines as we want, and there's no limit or direct costs in doing this."* Another participant noted enhanced scalability in reacting to changing IT resource requirements with VMware Cloud on AWS: *"VMware Cloud on AWS allows us to either move or increase the footprint on workloads out into AWS whenever we need to ... It's great to be able to either move the whole workload to VMware Cloud on AWS or add on additional VMs."*

Business Impact

IDC also evaluated the business impact for interviewed organizations of using VMware Cloud on AWS. Improved agility, scalability, and performance contributed to improved business results by better addressing business opportunities and better meeting customer expectations. As one study participant explained: *“VMware hybrid cloud with VMware Cloud on AWS is allowing us to better serve our business community, which indirectly means ... probably 1% higher revenue.”*

A major benefit for interviewed companies was reducing the impact of unplanned downtime as described previously. Unplanned outages could be costly to these businesses and affect business operations and therefore results. Addressing this benefit in quantifiable terms, another study participant commented: *“With less unplanned downtime on VMware Cloud on AWS comes more revenue because we’re billing more hours with less downtime. That’s really the biggest business impact. One hour less of downtime can mean a million dollars for the company.”*

IDC quantified the value of these benefits in terms of revenue impact as shown in Table 5. IDC put the value of higher revenue linked to use of VMware Cloud on AWS through business enablement at an annual average of \$6.56 million per organization. Further, study participants reported avoiding the loss of revenue due to unplanned outages worth an annual average of \$3.45 million per organization. These twin revenue-related benefits reflect the real and significant impact that running applications and workloads on VMware Cloud on AWS has had for study participants.

TABLE 5 Impact on Business Results: Revenue

	Per Organization	Per 100 VMs
Higher revenue from improved business results		
Total additional revenue	\$6.56 million	\$1.31 million
Total net revenue*	\$983,600	\$196,000
Higher revenue from reduced unplanned downtime		
Total additional revenue	\$3.45 million	\$0.69 million
Total net revenue*	\$517,500	\$103,100

n = 10 Source: IDC, 2020

**15% margin assumption is applied.*

More Efficient and Cost-Effective Infrastructure

Interviewed VMware customers reported that VMware Cloud on AWS offered the ability to provision needed infrastructure resources at lower cost by moving from on-premises or private cloud environments to the public cloud. Study participants reported achieving the performance-related benefits already discussed even as they run equivalent workloads at an average 44% lower total cost over three years. Lower cost relates to both infrastructure-related savings and staff time savings and efficiencies.

On the infrastructure side, study participants reported spending 39% less with VMware Cloud on AWS than they would have otherwise needed to spend to run equivalent applications. They benefit from being able to more closely tailor compute and storage capacity to actual requirements as well as avoiding the need to make capital expense investments in hardware. Study participants spoke to these types of infrastructure-related cost savings:

- **Server hardware consolidation:** *"Before using VMware Cloud on AWS, we had 300 servers but we've been able to reduce that number by 25% ... Also, we're avoiding having to refresh another 10% of those servers, so 35% of servers in total ... We're avoiding \$1.5 million of server hardware refreshes."*
- **Substantial server avoidances:** *"VMware Cloud on AWS costs 15% less than running the same workloads on premises. We got rid of an estimated 500 servers ... Also, storage and networking costs would have added another 20% to that."*

Efficiencies for various IT teams, including IT infrastructure, security, and help desk teams, also contributed to lower operational costs for study participants. Interviewed organizations benefit from having more consolidated, streamlined environments for running business applications, as well as capturing time savings from VMware Cloud on AWS functionalities such as automation, embedded encryption, and self-service capabilities that limit IT team time requirements. Interviewed VMware customers provided examples of these types of IT staff-related efficiencies:

- **Infrastructure optimization that leads to IT infrastructure team efficiencies:** *"We had some servers that we didn't even know were being used. We shut them down to optimize capacity when we started using VMware Cloud on AWS ... In addition, we've gone from 40 to 20 IT infrastructure team members. Basically, their roles, responsibilities, and goals have changed and they're working on web applications and security now."*
- **Less time required to manage hardware:** *"As long as everything's working, I'm responsible for managing infrastructure. Over time, that was a full-time job, but it's less now with VMware Cloud on AWS because I don't manage as much physical hardware. Now it takes around 20% of my time ... This means there's time to support other types of infrastructure and our audiovisual capabilities."*

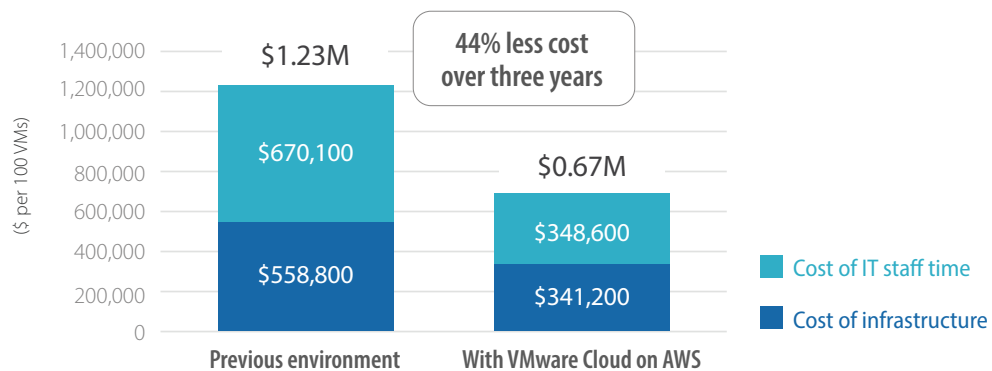
Needing less staff time to manage, secure, and support IT infrastructure freed up IT teams to work on other initiatives and support business growth. As shown in Table 6, IDC calculates that for IT infrastructure teams, the staff time required to manage infrastructure was reduced by a significant 48%; security teams and help desk teams achieved efficiencies of 26% and 69%, on average, respectively.

TABLE 6 Impact on IT Teams

	Previous Environment	With VMware Cloud on AWS	Difference	Benefit with VMware Cloud on AWS (%)
IT infrastructure teams				
Staff time to manage infrastructure (FTEs per organization)	13.1	6.8	6.3	48
Value of staff time per organization per year	\$1.31 million	\$0.68 million	\$0.63 million	48
IT security teams				
Staff time to manage infrastructure (FTEs per organization)	8.4	6.2	2.2	26
Value of staff time per organization per year	\$0.84 million	\$0.62 million	\$0.22 million	26
Help desk teams				
Staff time to manage infrastructure (FTEs per organization)	7.0	2.2	4.8	69
Value of staff time per organization per year	\$0.70 million	\$0.22 million	\$0.48 million	69

n = 10 Source: IDC, 2020

Figure 6 summarizes the total cost of operations for interviewed VMware customers over three years by combining infrastructure and IT infrastructure team staff time costs. As shown in Figure 6, IDC calculates that study participants will run equivalent workloads on VMware Cloud on AWS at a 44% lower cost over three years, reflecting an average savings of \$560,000 per 100 VMs in three years.

FIGURE 6 Three-Year Cost of Operations

n = 10 Source: IDC's IaaSView Survey, 2020

ROI Summary

IDC's analysis of the financial benefits and investment costs related to study participants' use of the VMware Cloud on AWS in the context of VMware hybrid cloud environments is presented in Table 7. IDC calculates that study participants will achieve total discounted three-year benefits of \$10.58 million per organization (\$2.11 million per 100 VMs) in employee productivity gains, IT staff efficiencies, higher revenue, and lower IT infrastructure costs as described previously. These benefits compare with projected total discounted investment costs over three years of \$2.35 million per organization (\$0.47 million per 100 VMs). IDC calculates that at these levels of benefits and investment costs, interviewed VMware customers will achieve a three-year ROI of 351%, with breakeven on their investment occurring in an average of eight months.

TABLE 7 Three-Year ROI Analysis

Three-Year ROI Analysis	Average per Organization	Average per 100 VMs
Benefits (discounted)	\$10.58 million	\$2.11 million
Investment (discounted)	\$2.35 million	\$0.47 million
Net present value (NPV)	\$8.24 million	\$1.64 million
Return on investment (ROI)	351%	351%
Payback period	8 months	8 months
Discount rate	12%	12%

n = 10 Source: IDC, 2020

CHALLENGES/OPPORTUNITIES

While VMware Cloud on AWS has seen steady momentum in terms of regional expansion and customer adoption, enterprises' accelerated commitment to cloud post-pandemic means that many customers will still be early in their learning curve when it comes to moving to a VMware hybrid cloud environment with VMware Cloud on AWS. They will need guidance on the optimal ways to unlock value from this easy-to-use hybrid cloud experience.

Opportunities to accelerate the time to value and adoption by customers include:

- Providing use case and vertical-specific reference architectures that highlight ways in which customers can rapidly unlock the joint value delivered by VMware and AWS, including use of adjacent services with the broader AWS public cloud and acceleration of modernization exercises using new VMware offerings such as VMware Tanzu
- More active and prescriptive guidance to the global VMware partner community on how best to engage customers and identify opportunities to deliver early value through adoption of VMware Cloud on AWS

Enterprise IT organizations are usually time and resource constrained because of operational requirements and budget limitations. Active guidance on how to implement and demonstrate modernization and transformation initiatives will simplify the onboarding exercise for customers, contribute to the momentum of success stories, and accelerate the adoption of the offering.

CONCLUSION

The accelerated move to cloud, along with a rapid increase in pace of change in business operations and growing digitalization, has created a volatile operating environment for enterprises. A digital IT foundation that enables agility and flexibility is critical for competitiveness in this environment, and a first step toward this is the implementation of a successful cloud IT environment. Enterprises see a hybrid cloud approach as the optimal cloud strategy toward this foundation. VMware Cloud on AWS and the broader VMware-based hybrid cloud portfolio are designed to optimize the implementation and operation of this hybrid cloud environment.

IDC's research demonstrates the extent to which organizations enabled their business operations and optimized IT-related costs by using VMware Cloud on AWS as part of a VMware-based hybrid cloud infrastructure. For study participants, the benefits of running

workloads on VMware Cloud on AWS begin with migration; they reported completing migration in much less time and at lower cost and risk than they would have with another public cloud solution by leveraging their existing use and knowledge of VMware solutions, automation capabilities, and tools and by avoiding the need to train and upskill staff. For study participants, these migration-related benefits provide significant levels of value, over \$4,000 of value per VM in terms of cost savings and benefits related to improved business results and productivity as a result of faster migrations.

Study participants also reported that VMware Cloud on AWS provides a robust, agile, and cost-effective infrastructure for running workloads on an ongoing basis. As a result, they can run like workloads on VMware Cloud on AWS at a significantly lower total cost than with an on-premises environment, and their businesses, employees, and customers benefit from increased reliability, performance, and flexibility. IDC calculates that interviewed organizations will achieve value worth an average of \$494,500 per 100 VMs per year, which would result in an average three-year ROI of 351%.

APPENDIX

Methodology

IDC used the following three-step method for conducting the ROI and Business Value analysis informing this study's results and conclusions:

- **Gathered quantitative benefit information during the interviews using a before-and-after assessment for interviewed organizations of using VMware Cloud on AWS in the context of running a VMware hybrid cloud environment and a comparison of anticipated time and costs required for migrating compared with another public cloud alternative.** In this study, the benefits of using VMware Cloud on AWS included cost savings, IT staff time savings and efficiencies, and higher user productivity and revenue.
- **Created a complete investment (three-year total cost analysis) profile based on the interviews.** Investments go beyond the initial and annual costs of deploying and using VMware Cloud on AWS and can include additional costs related to migrations, planning, consulting, and staff or user training.
- **Calculated the ROI and payback period.** IDC conducted a depreciated cash flow analysis of the benefits and investments for the organizations' use of VMware Cloud on

AWS over three years. ROI is the ratio of the net present value (NPV) and the discounted investment. The payback period is the point at which cumulative benefits equal the initial investment.

IDC's standard ROI methodology was utilized for this project. This methodology is based on gathering data from current users of VMware Cloud on AWS as part of a VMware hybrid cloud environment. Based on interviews with 10 organizations, IDC performed a three-step process to calculate the ROI and payback period:

- Measure the benefits from use of VMware Cloud on AWS solutions in terms of IT staff efficiencies and productivity gains, reductions in IT costs, and higher user productivity and revenue.
- Ascertain the investment made in deploying VMware Cloud on AWS and associated migration, training, and support costs.
- Project the costs and savings over a three-year period and calculate the ROI and payback for use of VMware Cloud on AWS.

IDC bases the payback period and ROI calculations on assumptions that are summarized as follows:

- Time values are multiplied by burdened salary (salary + 28% for benefits and overhead) to quantify efficiency and productivity savings. IDC assumes a fully burdened salary of \$100,000 per year for IT staff, including developers, and \$70,000 for other employees, with an assumption of 1,880 hours worked per year.
- Downtime values are a product of the number of hours of downtime multiplied by the number of users affected.
- The impact of unplanned downtime is quantified in terms of impaired end-user productivity and lost revenue.
- Lost productivity is a product of downtime multiplied by burdened salary.
- The net present value of the three-year benefits is calculated by subtracting the amount that would have been realized by investing the original sum in an instrument yielding a 12% return to allow for the missed opportunity cost. This accounts for both the assumed cost of money and the assumed rate of return.
- Because every hour of downtime does not equate to a lost hour of productivity or revenue generation, IDC attributes only a fraction of the result to savings. As part of our assessment, we asked each company what fraction of downtime hours to use in

calculating productivity savings and the reduction in lost revenue. IDC then taxes the revenue at that rate.

- Further, because IT solutions require a deployment period, the full benefits of the solution are not available during deployment. To capture this reality, IDC prorates the benefits on a monthly basis and then subtracts the deployment time from the first-year savings.

Note: All numbers in this document may not be exact due to rounding.

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