IDC ANALYZE THE FUTURE

The Business Value of VMware Cloud on AWS for Supporting Business-Critical Applications

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Navigating this White Paper

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BUSINESS VALUE HIGHLIGHTS

Click on highlights below to navigate to related content within this white paper.

479%
5-year ROI

$9.6M
total new revenue gained per year

18% more productive
developer teams

37% increase
in application performance

13% more efficient
compliance teams

40% more efficient
IT infrastructure management

76% reduction
in unplanned downtime

40% reduction
in IT infrastructure costs

46% faster
cloud migrations

Executive Summary

Over the past decade, public cloud has been rising to become the major force that is reshaping the IT industry. The transition to cloud is long and multifaceted, encompassing different types of workloads and cloud models. Customers are both building new cloud-native applications as well as migrating existing applications (that cannot be practically rewritten or refactored) to the cloud. While public cloud is a huge shift for industry, on-premises is not going away completely. The need to seamlessly integrate the public cloud and on-premises environments into a hybrid cloud is crucial to avoiding the creation of additional siloes and increasing flexibility and agility. The reality is that cloud, in all its forms, is inevitable for organizations, because the competitive nature of business will drive them to innovate, cut costs, and develop digital assets more quickly.

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Amazon Web Services (AWS) is VMware's preferred public cloud partner for all vSphere-based workloads. VMware Cloud on AWS brings VMware's Software-Defined Data Center software to the AWS Cloud and enables customers to run production applications across VMware vSphere-based private, public, and hybrid cloud environments, with optimized access to AWS services. The deployment of this solution paves the way for organizations to modernize their business-critical applications with jointly engineered and supported services from AWS and VMware. IDC interviewed organizations across multiple industries about the impact of running their business-critical applications on VMware Cloud on AWS. Study participants identified key benefits in adopting the service, including the ability to efficiently migrate workloads to the public cloud while optimizing performance, agility, and cost. This also allowed them to leverage their existing VMware technologies, knowledge, governance, and best practices. Based on interviews with 17 VMware Cloud on AWS customers, IDC puts the average annual benefit they will achieve at $5.31 million per organization (or $958,700 per 100 virtual machines [VMs]).

The average annual benefit is achieved through:

- **Fostering more efficient IT infrastructure management teams** as well as database administrators (DBAs) and development and compliance teams
- **Providing robust application and business support** with improved agility, scalability, and performance to help organizations address business opportunities and increase revenue
- **Reducing the frequency and duration of unplanned outages,** thereby minimizing costs related to lost productivity and revenue
- **Enabling more efficient use of resources** to reduce costs for running their IT infrastructure to support workloads and applications

Situation Overview

For the past decade, public cloud has been changing organizations' IT strategies as they grapple with digital transformation. Digital transformation has pushed organizations of all types to produce more innovative applications, develop and deploy them faster, and operate them at a larger scale. The instant and on-demand nature of cloud services was immediately alluring to customers looking to experiment and deploy more quickly and led to the fast rise of public cloud. Organizations also began to rethink what they wanted to control and manage. With cloud, organizations can offload infrastructure management and devote more resources to areas such as applications and their own IP.

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Public cloud service models and architectures have also influenced on-premises enterprise datacenters, with private clouds in demand and growing at the expense of traditional IT. This has led to the concept of hybrid clouds, which is the integration of public and private clouds. Hybrid cloud is not a single technology but rather the use of multiple technologies and strategies at various levels of the stack to achieve more consistency and manageability. The level of integration can vary greatly, but the tighter the integration, the greater the level of seamlessness. A fully consistent environment, down to the lowest levels of the software stack, can simplify management, provide operational consistency, and enable easy portability between environments to help create a more unified environment between on-premises and public cloud.

One of the challenges for customers moving to the public cloud is the migration of existing workloads. The reality for many is that they have a large portfolio of existing applications that cannot be decommissioned overnight and replaced with a cloud-native version. These applications were not designed for cloud and have a different set of infrastructure assumptions and dependencies. However, companies are looking for a cloud strategy to address these applications and modernize them.

The main challenge is that while virtualization is ubiquitous today, the virtualization within enterprise datacenters is often different than what is in the public cloud. While there are tools that can convert one VM format to another, the hurdles go far beyond VM formats. For example, different VM platforms also mean different attached networking and storage subsystems. Thus, performance optimizations, ISV certifications, automation,

and toolsets usually change. This extends to other processes that can be infrastructure-specific, such as high availability, backup, and disaster recovery. Doing any kind of platform migration is extremely challenging as it means refactoring and learning a new set of skills, tools, and processes to manage applications.

In order to avoid refactoring and achieve a seamless migration, one strategy is to have a similar software stack on-premises and in the public cloud, from the hypervisor on up the stack. This consistency is particularly beneficial for legacy workloads that are tightly coupled to the infrastructure environments.

A highly integrated hybrid cloud allows for:

- **Seamless portability:** Workloads can be moved in either direction. A fully consistent environment means that when an application is moved, most of its optimizations, integrations, and attached management process can also come with it.
- **Unified networking:** Combining both environments into a single logical network avoids DNS and IP address-change problems as workloads move between environments.
- **Consistent operations:** Using a single platform allows users to keep the same operational processes and manage the entire hybrid environment with a single set of tools within a single unified team.
- **Modernization:** Integrated access to cloud-native services can enable modernization of existing applications and build new applications.

Solving these integration challenges means that the public cloud can become a seamless extension of enterprise datacenters to address legacy applications while also supporting next-generation cloud-native applications. It also allows organizations to be flexible with the mixture of on-premises and cloud, with the ability to change the ratio as needed with bidirectional portability.

The road to cloud requires the adoption of many different types of cloud technologies. The fully consistent hybrid cloud is an essential tool for addressing the migration and management of existing datacenter workloads in the cloud.

Overview of VMware Cloud on AWS

VMware Cloud on AWS is the preferred service for AWS for all vSphere workloads. It combines the VMware software stack that is a mainstay in enterprise datacenters with the scale and global reach of AWS regions. VMware Cloud on AWS is jointly engineered by AWS and VMware and is fully operated by VMware on the AWS cloud.

VMware Cloud on AWS enables several key use cases:

- **Datacenter extension**
- **Datacenter exit or cloud migration**
- **Application modernization**
- **Disaster recovery**

By using the same VMware software that customers have in their own datacenters, VMware Cloud on AWS becomes a seamless extension of on-premises datacenters, with unified management of on-premises and cloud resources through the familiar vCenter and vRealize interfaces. Using familiar VMware tools means IT staff don't have to learn new skills and interfaces when expanding to the public cloud.

VMware Cloud on AWS addresses several concerns and challenges when migrating datacenter applications to the cloud.

VMware's Software Defined Datacenter enables a consistent hybrid cloud with key subsystems such as:

- Live migration of workloads with the VMware HCX service or Cloud Motion with vSphere Replication
- VMware's software-defined networking (VMware NSX) which creates a unified network for easy workload migration without dealing with IP address changes. Customers that have NSX on-premises can maintain consistency in established network and security policies in VMware Cloud on AWS.
- VMware vSAN running on local storage which provides vSphere-native, high-performance, and highly secure storage in VMware Cloud on AWS.

VMware Cloud on AWS addresses several concerns and challenges when migrating datacenter applications to the cloud:

- VMware clusters in VMware Cloud on AWS are fully dedicated at the physical server level, which means a higher level of security and performance since the server is not shared with other tenants.
- Most applications and tools that work on VMware will work on VMware Cloud on AWS. VMware Cloud on AWS has its own certification process for applications and tools, and these are listed on the VMware marketplace. The high level of compatibility will ease the migration of many existing applications and their dependencies.

VMware Cloud on AWS also addresses more than just traditional datacenter server workloads. VMware Horizon on VMware Cloud on AWS offers the ability to run cloud-hosted virtual desktops, which can be added and extended by leveraging cloud scale and agility. The consumption-based nature of cloud infrastructure can also help optimize virtual desktop infrastructure (VDI) costs, in paying only for what is used.

While VMware Cloud on AWS uses the same VMware components that VMware users have on-premises, it is also built as a cloud-first solution.

VMware Cloud on AWS leverages a combination of VMware's Software-Defined Data Center and AWS's cloud infrastructure and services:

- On-demand capacity and flexible consumption models: Clusters can be configured and provisioned in just a couple of hours, and new hosts can be added in minutes.
- Self-service to improve developer productivity
- API-enabled to allow infrastructure as code and automation
- VMware Tanzu Kubernetes Grid adds the capability to run Kubernetes-orchestrated containers on VMware Cloud on AWS.

- The full range of AWS native services are available to VMware Cloud on AWS for application modernization. Because they are located in the same cloud, users will get high-throughput, low-latency access to AWS services.
- The global reach and scale-out capacity of AWS can be leveraged by VMware users and workloads.

The Business Value of VMware Cloud on AWS

Study Demographics

IDC conducted research that explored the value and benefits for organizations in business-critical workloads and applications on VMware Cloud on AWS. The project included 17 interviews with organizations that had experience with and knowledge about the benefits and costs of using this platform. The interviews covered a variety of quantitative and qualitative questions about the impact on their IT operations, costs, and business results.

Table 1 presents the study demographics and profiles. The organizations interviewed had a base of 36,979 employees, which would indicate several large companies, but the median was 7,200, meaning IDC interviewed several smaller firms (the smallest being a 550-person organization). In terms of geographical distribution, 14 companies were based in the United States and three in Australia. (Note: All numbers cited in this paragraph represent averages.)

TABLE 1

Firmographics of Interviewed Organizations

	Average	Median	Range
Number of employees	36,979	7,200	550 to 257,000
Number of IT staff	2,637	280	12 to 22,500
Number of IT users	35,636	5,300	550 to 244,150
Number of business applications	3,009	188	5 to 25,000
Revenue per year	$11.6B	$1.70B	$65M to $115.6B
Countries	United States (14), Australia (3)		
Industries	Healthcare (4), financial services (3), retail (3), government (2), professional services (2), insurance, manufacturing, telecommunications		

n = 17, Source: IDC In-depth Interviews, December 2020

Choice and Use of VMware Cloud on AWS

Interviewed organizations discussed the rationale behind their decisions to adopt VMware Cloud on AWS. Organizations cited their ability to leverage VMware-based solutions as well as the quality and rich functionality of VMware Cloud on AWS as a public cloud solution, which allowed them to leverage the scalability and flexibility of the public cloud to scale globally. Study participants also appreciated the ease of multi-directional workload migration between their on-premises VMware environments and VMware Cloud on AWS. The ability to use the same VMware technologies that IT team members were already familiar with was an important consideration for many companies, as it minimized the time and expense associated with training. Proactive customer support and reduced costs were also cited as important factors in their decisions.

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Study participants explained these considerations:

- **The ability to scale globally:**
  "We needed to scale our application across the globe in different regions, and by using AWS we can remove the infrastructure management that we were doing on our part and have AWS and VMware handle that."

- **Easier migration:**
  "We thought the idea would be to work out how to migrate everything ourselves, and maybe refactor applications and things like that. But we couldn't guesstimate how long it's going to take, and how much that will cost. So then we thought the easiest thing is just lift what we have on-premises and put it in AWS. VMware Cloud on AWS allowed us to just do that. We set up a similar VMware environment and all of our servers exactly as they were. Everything kept running, and that gave us the confidence in the environment."

- **Proactive customer support:**
  "The main reason we chose AWS was because of the tools it integrates with in terms of reporting and performance. It gives proactive visibility into some of these things. Another factor was support. Other providers will say, 'Well, this is not our issue, you need to go and deal with your third party.' AWS actually goes above and beyond to say, 'Okay, what are you looking into? Let me help you out with it.' And: 'Here's what I would recommend.' Even if it's not their issue, they will help figure out some of the challenges and make sure we do what's necessary. They provide a tremendous service."

- **Reduced costs and experience running VMware applications:**
  "The reason for choosing AWS over other providers was cost. That's always important to us. Having experience with VMware applications was also important in selecting VMware Cloud on AWS, since we used their virtual software on our in-house servers."

- **Easier management and reduced third-party costs:**
  "We were looking at more business agility and trying to get away from having to constantly hire contractors. The executives got frustrated because they were seeing very slow movement, adoption, and speed to delivery. … Everything here is now owned, managed, and supported officially by VMware, and it gives our executives peace of mind."

Table 2 provides a snapshot of VMware Cloud on AWS use by interviewed organizations. On average, they reported running 95 business applications supported by a total of 64 databases and 180 TBs of system data capacity. 42% of all end users were engaged with applications supported by VMware Cloud on AWS.

TABLE 2

VMware Cloud on AWS Environments

	Average	Median
Number of virtual instances/VMs	554	55
Number of business applications	95	18
Number of databases	64	14
Amount of storage, TBs	180	50
Number of countries in which customers have operations	5	3
Number of sites/branches in which customers are accessing VMware Cloud on AWS	47	9
Percentage of internal users using VMware Cloud on AWS applications	42%	26%

n = 17, Source: IDC In-depth Interviews, December 2020

Business Value and Quantified Benefits

Interviewed organizations attributed significant value to running their business applications on VMware Cloud on AWS. They cited the benefits of more efficient IT infrastructure management teams along with database administrators (DBA) and development and compliance teams. They confirmed that the service cost-effectively provided robust application and business support with agility, scalability, and performance, helping their organizations address business opportunities and increase revenue. It also helped to reduce the frequency and duration of unplanned outages, thereby minimizing costs related to lost productivity and revenue.

Interviewed VMware customers spoke to these and other advantages of VMware Cloud on AWS:

→ **Easier management:**

"The IT benefit is that you don't need your people to learn another technology. All the knowledge to run and maintain the systems your technology people already have because they're familiar with VMware."

- **Easier to set up in a new region:**
  "We're still rolling out new infrastructure and building up with much less hassle across multiple locations. Also, procurement is quite easy because we don't have to wait for hardware, a process that normally takes a long time."
- **Quicker and more accurate migrations:**
  "The ability to migrate to the cloud and the speed of migration to the cloud is incredible."
- **Better adoption speed and scalability:**
  "The biggest benefits are speed of adoption and ability to do scaling up and down fairly easily. High-end vendor support is important to us, being able to provision instances dynamically, and automation behind those instances. Those would be the big drivers."
- **Improved scalability helping business productivity:**
  "The benefits are an increase in productivity, efficiency, stability, and scalability because we're able to scale in a matter of minutes, compared to a matter of hours."

Based on interviews with VMware Cloud on AWS customers, IDC calculates that they will achieve value worth an annual average of $5.31 million per organization, or $958.7K per 100 VMs utilized in the following areas (Figure 1, next page):

- **IT staff productivity benefits:**
  Study participants derive benefits from the ease of use and robust functionality of VMware Cloud on AWS to minimize day-to-day work for IT teams. As a result, IDC projects that they will realize staff time savings and productivity gains worth an average of $2.58M per organization ($466,500 per 100 VMs).
- **Business productivity benefits:**
  Study participants support their business activities with greater flexibility and improved IT infrastructure performance, helping to satisfy existing customers and garner new business opportunities. IDC puts the value of higher revenue at an annual average of $1.41M per organization ($254,500 per 100 VMs).
- **Risk mitigation — user productivity benefits:**
  Study participants have reduced the cost of lost employee productivity and revenue caused by unplanned outages. IDC calculates that they will see benefits worth an average of $781,000 per organization ($140,900 per 100 VMs) in higher productivity and revenue.
- **IT infrastructure cost reductions:**
  Study participants can avoid buying or replacing on-premises infrastructure and can use pay-as-you-go consumption to optimize IT infrastructure costs. IDC estimates that they will save an average of $536,000 per organization ($96,800 per 100 VMs).

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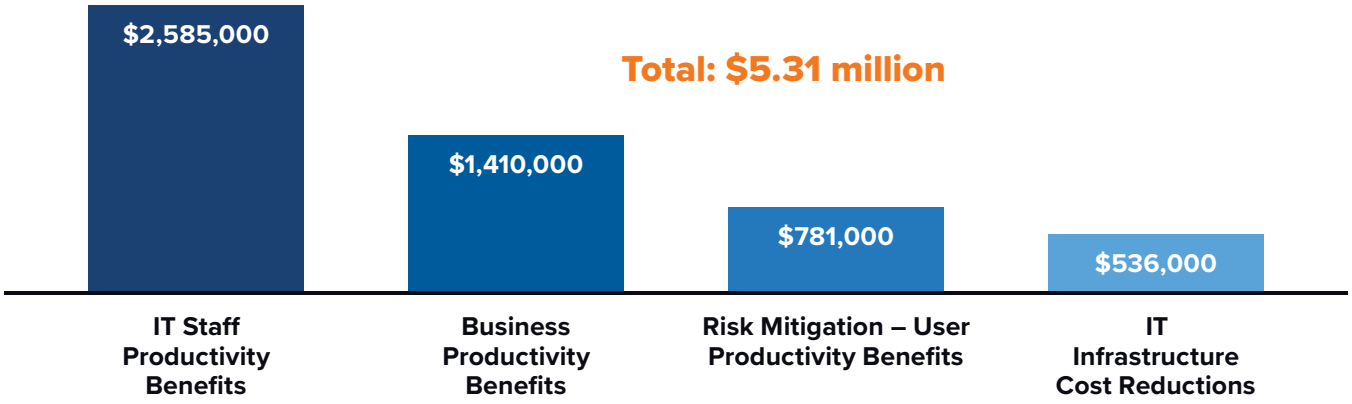
FIGURE 1

Average Annual Benefits per Organization



n = 17, Source: IDC In-depth Interviews, December 2020

Improved IT Operations, Data Migration, and Cost of Operation

VMware Cloud on AWS integrates VMware compute, storage, and network virtualization products and services to run on a dedicated single-tenant infrastructure delivered on Amazon Elastic Compute Cloud (Amazon EC2) bare-metal infrastructure, thereby optimizing the migration of applications and workloads. Interviewed organizations benefited from improved infrastructure performance, reliability, and availability. Interviewees told IDC that utilizing AWS's more resilient and agile infrastructure limited the impact of unplanned outages on business-critical applications and improved business results.

Study participants explained:

- **Easier management of infrastructure:**
  "Because there's much less failure in the data stack, that means less issues or reporting so everyone can focus on the business and not worry about, 'Is the data refreshed? Are there errors?' We used to have downtimes every week, a couple of hours here or there, just because we had to fix things so much. Our own data operations have dramatically improved. We've reduced our operations effort from 15 people doing operations and we now have four or so people. That's a massive change because of how big the reduction was when we moved from on-prem to VMware Cloud on AWS."

- **Reduced burden on staff to expand infrastructure:**
  "It has reduced a lot of their burden dealing with infrastructure issues, so none of these things are a problem anymore. We've got more RAM and more disks available on our VMware and AWS setup. Before, if we had to expand a disk, we had to then look around and spend time trying to work out what we could do and reorganize things. Now, we just expand a disk and that's it."

- **Focus on critical initiatives:**

  "The time freed up by VMware Cloud on AWS allowed all my engineers and my BI analyst to focus on building the new architecture, as well as new reports. From a company perspective, we have three core initiatives: One is the data strategy itself, which is the modernizing of our data platforms. The second is our customer strategy, which means we try to move away from our transactional way of working with customers to a stickier relationship-building approach. The third is making sure we are improving how we integrate with partners and support them. VMware Cloud on AWS basically started our data strategy, and it actually enables all three core initiatives."

- **Easier tools:**

  "At any given time, if I looked through one of the VMware tablets, I would have a separate tool for monitoring, reporting, or services like that. On AWS, it's all on one screen. In a nutshell, I am paying one price that encompasses 10 different capabilities. On-prem, I pay for 10 different services to get the same functionality."

Migration efficiencies are an important aspect of VMware Cloud on AWS. The platform is designed to optimize bidirectional migration of applications and workloads between on-premises VMware environments and VMware Cloud on AWS. Interviewed organizations were able to complete workload migrations to VMware Cloud on AWS more quickly and with less staff effort based on the efficiencies of the platform functionality, including automation, various available tools, and being able to leverage existing staff technical skills related to VMware. As shown in Table 3, IDC quantified these migration efficiencies. As shown, the time that staff required to perform various migration tasks was improved by 49%.

TABLE 3

Migration Impact

	Before VMware Cloud on AWS	With VMware Cloud on AWS	Difference	% Benefit
Time to migrate, months (per organization)	6.8	3.6	4.5	46%
Staff time to migrate, full-time equivalents (FTEs) per organization	20.9	10.6	10.2	49%
Staff time to migrate, hours per 100 VMs	7,078	3,604	3,474	49%

n = 17, Source: IDC In-depth Interviews, December 2020

Study participants reported that VMware Cloud on AWS offered specific benefits for IT infrastructure teams. In general, these teams needed less staff time to manage, secure, and support IT infrastructure. This freed them up to work on other initiatives and support business growth. As shown in Table 4, IDC calculated that the staff time required for IT infrastructure management, as measured in full-time-equivalent staff (FTE), was reduced by 40%. It should be noted that this is not a headcount reduction; according to respondents, employees were repurposed to work on other business-related initiatives because of the aforementioned time freed up. This translated into an annual business value of approximately $920,000.

TABLE 4

IT Infrastructure Management

	Before VMware Cloud on AWS	With VMware Cloud on AWS	Difference	% Benefit
Staff time to manage infrastructure, FTEs per organization	23	13.8	9.2	40%
Staff hours per VM per year	78	47	31	40%
Value of staff time, $ per organization per year	$2.30M	$1.38M	$920.7K	40%

n = 17, Source: IDC In-depth Interviews, December 2020

The improved reliability made possible by VMware Cloud on AWS reduced the staff time required for IT help desk tasks and activities as shown in Table 5. The staff time required to respond to help desk calls from end users and to resolve IT technical and resource issues was significantly reduced (73%). This resulted in an annual productivity-based business value of $480,600.

TABLE 5

IT Help Desk

	Before VMware Cloud on AWS	With VMware Cloud on AWS	Difference	% Benefit
Staff time to provide help desk support, FTEs per organization	6.6	1.8	4.8	73%
Staff hours per VM per year	22	6	16	73%
Value of staff time, $ per organization per year	$657.9K	$177.3K	$480.6K	73%

n = 17, Source: IDC In-depth Interviews, December 2020

VDI applications were widely deployed in the IT environments of interviewed companies. With more employees working at home once the COVID-19 pandemic began affecting operations in March 2020, the use of VDI computer resources has assumed increased importance for many organizations. Study participants reported that VDI management teams were able to deploy virtual desktops and applications more quickly with VMware Cloud on AWS. As shown in Table 6, the staff time required for the deployment and management of VDI resources was reduced by 28%, which enabled these resources to work on other projects. This resulted in an annual increase in productivity-related business value of $447,400.

TABLE 6

VDI Management Teams

	Before VMware Cloud on AWS	With VMware Cloud on AWS	Difference	% Benefit
Staff time to manage VDI operations, FTEs per organization	16	11.5	4.5	28%
Staff hours per VM per year	54	39	15	28%
Value of staff time, $ per organization per year	$1.60M	$1.15M	$447.4K	28%

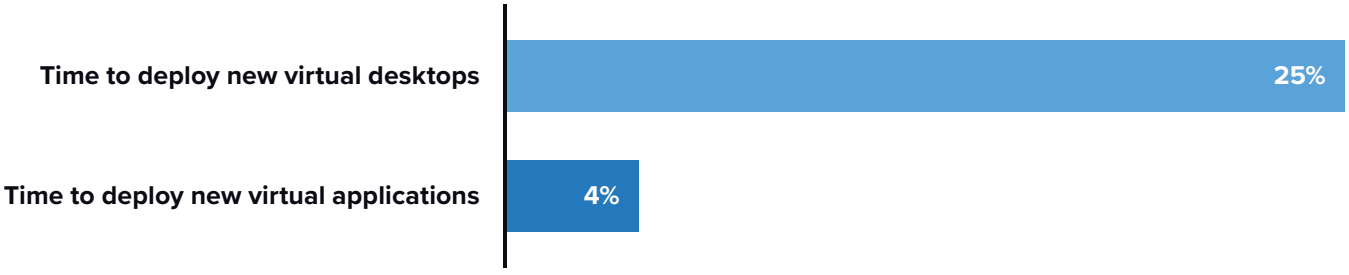
n = 17, Source: IDC In-depth Interviews, December 2020

IDC drilled down on these improvements in VDI management by evaluating specific tasks. As shown in Figure 2, the time needed by VDI teams to deploy virtual desktops was reduced by 25%. In addition, the time needed to deploy new virtual applications on those systems was reduced by 4%.

FIGURE 2

VDI Agility Impact

(% improvement)



n = 17, Source: IDC In-depth Interviews, December 2020

IDC identified database management as another key IT resource function for interviewed companies where VMware Cloud on AWS provided positive impacts. Table 7 shows staff productivity improvements for database management teams. As shown, the staff time required for database management was decreased by 28%, resulting in an annual increase in productivity-related business value of $380,500.

TABLE 7

Database Management

	Before VMware Cloud on AWS	With VMware Cloud on AWS	Difference	% Benefit
Database administrator, FTEs per organization	13.4	9.6	3.8	28%
Staff hours per VM per year	46	33	13	28%
Value of staff time, $ per organization per year	$1.34M	$962.4K	$380.5K	28%

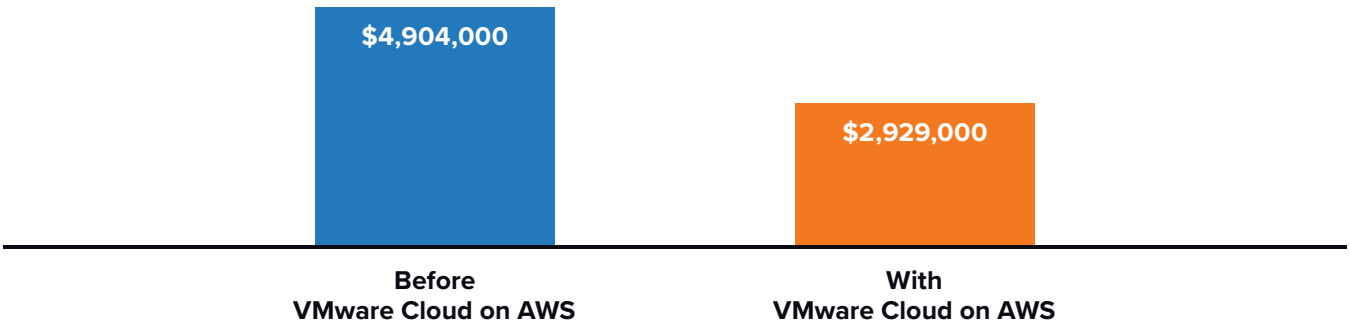
n = 17, Source: IDC In-depth Interviews, December 2020

Interviewed customers reported that VMware Cloud on AWS allowed them to provision the infrastructure resources they needed at lower cost by moving from on-premises environments to the AWS cloud. They benefited from being able to more closely tailor compute and storage capacity to actual requirements while avoiding the need to make additional investments in hardware-based platforms and resources. IDC calculated these IT infrastructure savings over a five-year period; as shown in Figure 3, comparable alternative or legacy environments would have cost interviewed companies 49% more.

FIGURE 3

IT Infrastructure Savings over 5 Years

(Cost of infrastructure)



n = 17, Source: IDC In-depth Interviews, December 2020

The Business Impact of VMware on AWS

IDC evaluated the business impacts for interviewed organizations of adopting VMware Cloud on AWS. The platform's agility, scalability, and performance improved business results by fostering a value chain that helped companies better address business opportunities and meet customer expectations. Study participants cited a number of benefits such as having the increased flexibility to more easily support COVID-19-related work-from-home requirements, reducing unplanned downtime, and improving application development processes and delivery.

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Study participants commented on these and related benefits:

- **Reduced business cost, better opportunities:**
  "The fact that you can run it virtually and don't have to be expanding your datacenters is definitely an improvement on cost controls. If you're not expanding your datacenter, you're not expanding your staff, and those costs don't increase. In the financial industry, you have to maintain at least a single if not a double redundancy with government regulations and requirements. If you're running a cloud environment, you don't have the costs of running those redundancies. You also don't have the cost of growth. The future of the financial industry is definitely the internet, instead of brick and mortar. You can grow more across the country by offering an internet presence than [by] acquiring other financial institutions. We're growing that way, and a lot less expensively."

- **Increased availability/uptime:**
  "With our prior third-party solution, we definitely had datacenter issues. Before when we were down, we couldn't hold meetings between ourselves, send messaging, or access our system to do contract approvals. With VMware Cloud on AWS, you don't even notice that switching is going on, and that's been a nice benefit. Now, we have different systems that service customers in different ways."

- **Flexibility to support work-from-home environments with less hardware:**
  "Peace of mind is the biggest benefit. Now our headquarters building could be destroyed and we could still work. The COVID stuff has really proven that as well. We have people just working from home, not coming in, and everybody's happily working. It doesn't matter where our infrastructure is based anymore. I don't have to worry about people checking physical machines for failing drives. The whole hardware side is not an issue anymore. It's made a heap of issues go away, which has been terrific."

- **Quicker development:**
  "Before, when we were sitting on apps in the datacenter, the timeline on that usually was 15 months on a net-new application. Now, with some of the COVID apps, we're able to go from conception to completion in one month."

IDC took a closer look at the impact of reducing unplanned downtime, which in today's environment always poses a threat of negatively affecting business operations and results. Table 8 quantifies post-deployment benefits. As shown, the number of annual unplanned outages was significantly reduced (57%), while remediation efforts took 45% less time to complete. Overall, business end users experienced a 76% reduction in the annual number of hours lost to unplanned downtime events and disruptions. IDC calculated the annual productivity business value related to minimizing unplanned downtime at $213,700.

TABLE 8

Unplanned Downtime Impact

	Before VMware Cloud on AWS	With VMware Cloud on AWS	Difference	% Benefit
Frequency per year	1.9	0.8	1.1	57%
Time to resolve, hours	4.1	2.3	1.8	45%
FTE impact, lost productivity due to unplanned outages	4	1	3.1	76%
Hours lost per user	1.3	0.3	1	76%
Value of lost productivity per year	$280.8K	$67.1K	$213.7K	76%

n = 17, Source: IDC In-depth Interviews, December 2020

Better availability for revenue-generating applications supported on VMware Cloud on AWS helped interviewed companies reduce revenue losses caused by unplanned downtime. IDC calculated the amount of total additional annual revenue available as a result of reducing these types of events at $3,140,333 as shown in Table 9.

TABLE 9

Risk Mitigation — Unplanned Downtime Revenue Impact

	Per Organization	Per 100 VMs Deployed
Total additional revenue per year	$3,140,333	$566,835
Assumed operating margin	15%	15%
Total recognized revenue, IDC model, per year	$471,050	$85,025

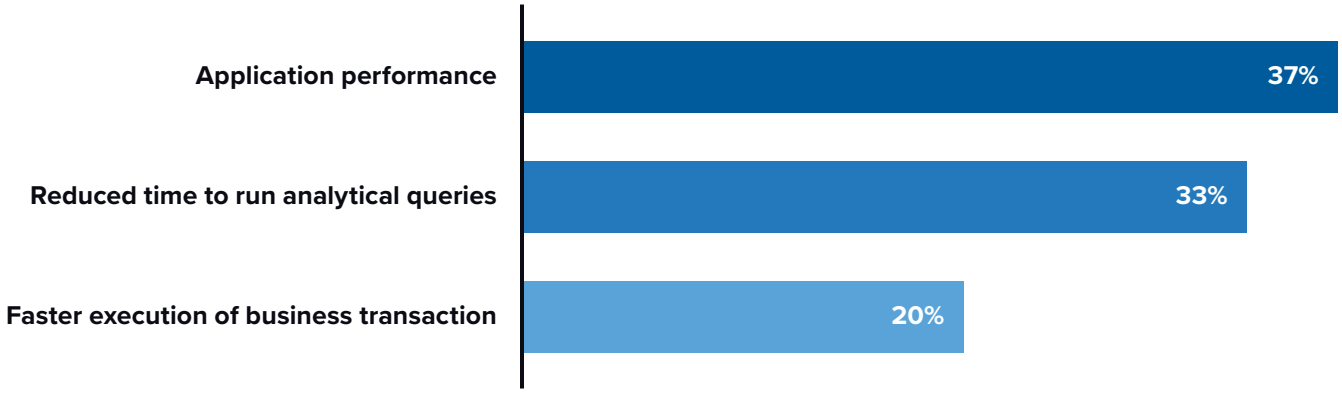
n = 17, Source: IDC In-depth Interviews, December 2020

Interviewed organizations reported a significant improvement in several key performance metrics that related to business-critical processes and tasks. As shown in Figure 4, after deployment of VMware Cloud on AWS, improvements were seen in application performance (37%), the time needed to run analytical queries (33% reduction), and business transaction speed (20% faster).

FIGURE 4

Impact on Performance Metrics

(% improvement)



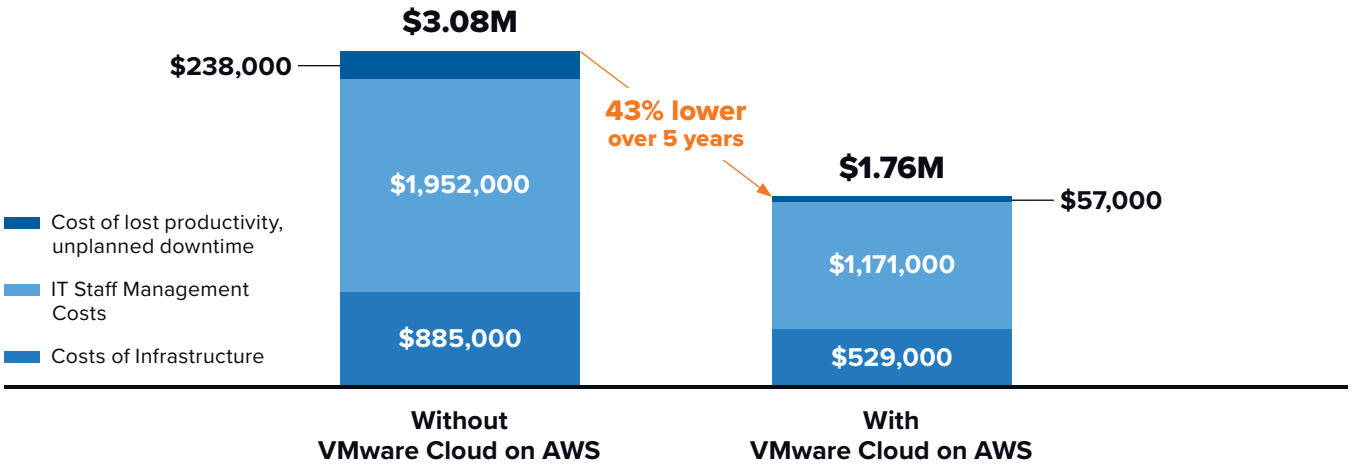
n = 17, Source: IDC In-depth Interviews, December 2020

Interviewed AWS customers reported that VMware Cloud on AWS offered them the ability to provision infrastructure resources at lower cost. Leveraging the platform enabled significant cost savings through reduced infrastructure costs, better availability, and easier management. First, platform efficiencies (see Figure 4) served to lower infrastructure-related costs. Second, a decrease in the time that staff needed to support the IT infrastructure resulted in significant operational cost savings to the business. Lastly, reductions in unplanned downtime ended up improving user productivity.

IDC calculated the cost of operations per 100 VMs using data related to these three cost factors compared with the costs of alternative or legacy approaches to provide equivalent functionality. As shown in Figure 5, over a five-year period, overall operational costs were projected to shift from $3.08 million to $1.76 million — a 43% reduction.

FIGURE 5

Cost of Operations per 100 VMs, 5 Years



n = 17, Source: IDC In-depth Interviews, December 2020

The features and certifications of VMware Cloud on AWS were combined with better availability of applications to help improve the efficiency of organizations' regulatory efforts. Table 10 shows a 13% improvement in compliance team productivity.

TABLE 10

Compliance Team Productivity

	Before VMware Cloud on AWS	With VMware Cloud on AWS	Difference	% Benefit
Equivalent productivity level, regulatory compliance team	16.3	18.4	2.1	13%
Value of regulatory compliance team time, $ per year per organization	$1.14M	$1.29M	$146.2K	13%

n = 17, Source: IDC In-depth Interviews, December 2020

Study participants reported that application developers were more productive because VMware Cloud on AWS improved the scalability of the storage and compute resources that developers need to develop applications, and also improved the availability of completed applications so developers spent less time addressing application availability issues. Table 11 shows an 18% improvement in developer team productivity, meaning that these average teams of 29.4 FTEs can now perform at the level of 34.6 FTEs without adding the 5.2 FTE difference.

TABLE 11

Application Development Staff Impact

	Before VMware Cloud on AWS	With VMware Cloud on AWS	Difference	% Benefit
FTEs per year per organization	29.4	34.6	5.2	18%
Salary cost per year per organization (based on FTEs)	$2.94M	$3.46M	$522.1K	18%

n = 17, Source: IDC In-depth Interviews, December 2020

The ability to scale current operations quickly helped organizations get to market faster and capture more revenue. As mentioned earlier, interviewees reported the ability to expand their capacity globally, improving their time to market. They also cited application developer improvements that increased business agility through faster deployment of new external-facing applications. Table 12 shows the business operations impact for revenue with total additional revenue per year calculated at $6.50M. Combining this revenue benefit with the $3.14M revenue benefit from unplanned downtime avoidance (Table 9, page 17) results in a total revenue benefit of $9.6M.

TABLE 12

Business Operations Impact: Revenue

	Per Organization	Per 100 VMs Deployed
Total additional revenue per year	$6.50M	$1.18M
Assumed operating margin*	15%	15%
Total recognized revenue per year (IDC model)	$983,600	$177,500

n = 17, Source: IDC In-depth Interviews, December 2020
*IDC applies assumed 15% margin in quantifying revenue and user productivity gains for purposes of its model.

The value chain fostered by VMware Cloud on AWS extended to line-of-business end users. These end users needed to adjust how they were working on a daily basis, especially under the disruptive conditions of a pandemic. Accordingly, the organizations leveraging VMware Cloud on AWS reported that the platform enabled their employees to stay productive. Table 13 shows that they experienced an average productivity gain of 8% and presents supporting metrics.

TABLE 13

End User Impact

Enhanced User Productivity	Per Organization
Number of users impacted	895
Average productivity gains	8%
Hours of additional productive hours gained per user	3.3
End user impact, FTE equivalent per organization per year	10.4
Value of end user time	$731.3K

n = 17, Source: IDC In-depth Interviews, December 2020

ROI Summary

IDC's analysis of the financial benefits and investment costs related to study participants' use of VMware Cloud on AWS is presented in Table 14 (next page). IDC calculates that on a per-organization basis, study participants will achieve total discounted three-year benefits of $18.9 million in employee productivity gains, IT staff efficiencies, higher revenue, and lower IT infrastructure costs as described. These benefits compare with projected total discounted investment costs over three years of $3.25 million on a per-organization basis. At these levels of benefits and investment costs, IDC calculates that interviewed VMware Cloud on AWS customers will achieve a five-year ROI of 479% with breakeven on their investment occurring in an average of 5.6 months.

TABLE 14

Five-Year ROI Analysis

	Per Organization	Per 100 VMs Deployed
Benefit (discounted)	$18.9M	$3.40M
Investment (discounted)	$3.25M	$587.3K
Net present value (NPV)	$15.6M	$2.82M
ROI (NPV/investment)	479%	479%
Payback (months)	5.6 months	5.6 months
Discount factor	12%	12%

n = 17, Source: IDC In-depth Interviews, December 2020

Challenges/Opportunities

Challenges

- VMware Cloud on AWS includes the full VMware stack with the latest technologies, some of which may not yet be adopted by customers on-premises, such as vSAN and NSX. There can be a learning curve for customers that are new to them, but in most cases customers will be rewarded with additional functionality.
- While cloud solutions can be developed to meet various technical, security, and compliance requirements, soft factors such as trust, cultural resistance, and perceived loss of control can be difficult to overcome, especially for conservative organizations that have a long DIY history.
- Customers will be weighing the fate of each workload over time, and organizations can have different needs and strategies that will affect where each workload ends up. While VMware Cloud on AWS migrates existing workloads to the cloud with the least amount of effort, some customers may decide not to migrate these workloads at all and run only cloud-native applications in the public cloud. Some workloads may endure a platform migration to enable them to run natively on the public cloud. And others may be decommissioned entirely in favor of a SaaS model. As cloud matures, there are an increasing number of options for workloads.

The compatibility of VMware Cloud on AWS allows applications and all their attached tooling and processes to be migrated intact. For many complex legacy workloads, this may be the only path to cloud available.

Opportunities

- VMware Cloud on AWS offers an easy path to cloud for existing datacenter applications that depend on VMware. The compatibility of VMware Cloud on AWS allows applications and all their attached tooling and processes to be migrated intact. For many complex legacy workloads, this may be the only path to cloud available.

- Moving applications to VMware Cloud on AWS allows those applications the opportunity for modernization by accessing the large portfolio of native AWS services such as AI/ML and analytics.
- Bidirectional portability is a unique feature of VMware Cloud on AWS that is accomplished by having similar stacks on both sides. With VMware being dominant in enterprise datacenters, the VMware platform is the gateway that can allow workloads to migrate seamlessly to where they are needed.

Conclusion

Public cloud is a major shift in IT that is already taking place. For nearly every organization, cloud is nearly unavoidable today. However, the transition to cloud can be long and complicated, considering the huge application portfolios that organizations manage, each with individual quirks, dependencies, and challenges. Users are working through their portfolios at varying rates of speed and laying out the possible paths to cloud that exist for each application.
A larger issue is how public cloud should be managed and integrated, as on-premises will continue to exist for the foreseeable future. A highly compatible and consistent environment across on-premises and public cloud can be a key tool for organizations to accelerate cloud migration while also reducing management, tooling, and skills challenges, and access native cloud services to modernize both existing and new applications to increase innovation and meet business needs.

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 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 (five-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 five 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. 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.

About the Analysts

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Harsh V. Singh is a Senior Research Analyst for the Business Value Strategy Practice, responsible for developing return-on-investment (ROI) and cost-savings analysis on enterprise technological products. Mr. Singh's work covers various solutions that include datacenter hardware, enterprise software, and cloud-based products and services. Mr. Singh's research focuses on the financial and operational impact these products have on organizations that deploy and adopt them.

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Gary Chen is IDC's Research Director, Software Defined Compute. His research focuses on server virtualization, container infrastructure and management, and cloud system software (system software used to build IaaS clouds such as OpenStack).

More about Gary Chen

Message from the Sponsor

Amazon Web Services provides a highly reliable, scalable, low-cost infrastructure platform in the cloud that powers hundreds of thousands of businesses in 190 countries around the world. For over 4 years, AWS and VMware have been jointly engineering, selling, operating and supporting innovative hybrid cloud solutions. Our partnership enables customers to match their applications to the best environment, simplify management with consistent operations, and build for the future modernizing with native AWS services while minimize migration risks. AWS is VMware's preferred public cloud partner for all vSphere-based workloads. VMware Cloud on AWS provides customers the ability to modernize applications with optimized access to native AWS services, from databases and containers to AI/ML and serverless, to further fuel innovation. VMware Cloud on AWS is the preferred service for AWS for all vSphere-based workloads.

To our customers who participated in this extensive business value study, we thank you for your support. We are delighted to find the study result reaffirming the significant business value to organizations of all sizes across different industries globally. For customers on the digital transformation journey, we hope this study helps you understand how VMware Cloud on AWS service and AWS can help accelerate your cloud migration and modernization efforts, and provides valid proof points for your organization to consider.

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Contact the AWS team to get started

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