

FORRESTER®

The Total Economic Impact™ Of VMware Cloud On AWS

Cost Savings And Business Benefits
Enabled By VMware Cloud On AWS

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Executive Summary

Cloud computing is an attractive strategy for many organizations — they can eliminate management and maintenance costs, improve organizational flexibility, and support new business initiatives. However, for many, attaining a true cloud deployment seems unattainable due to the excessive costs of refactoring applications and recruiting cloud-native skills. VMware Cloud on AWS allows organizations to achieve the economics of the cloud using existing skills and without rebuilding their existing applications.

[VMware Cloud on AWS](#) is an integrated cloud offering jointly developed by AWS and VMware, providing organizations with a scalable solution to migrate and extend their on-premises environments to the public cloud while mitigating migration challenges.

VMware commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) enterprises may realize by deploying VMware Cloud on AWS.¹ The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of VMware Cloud on AWS on their organizations.

To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed five representatives with experience using VMware Cloud on AWS. For the purposes of this study, Forrester aggregated the interviewees' experiences and combined the results into a single [composite organization](#) that is a multibillion-dollar B2B organization with global operations.

Reduction in operations labor hours:

50%



KEY STATISTICS



Return on investment (ROI)

99%



Net present value (NPV)

\$4.04M

Prior to using VMware Cloud on AWS, these interviewees maintained their own large on-premises vSphere environments. These data center environments required expensive systems maintenance, hardware refreshes, real estate, and power and cooling costs. The interviewees' organizations had previously explored moving to the cloud prior to the availability of VMware Cloud on AWS, but they determined that doing so would require significant business disruptions; rearchitecture of applications to run natively in the public cloud; and the investment in new cloud development and operations skills.

KEY FINDINGS

Quantified benefits. Three-year, risk-adjusted present value (PV) quantified benefits for the composite organization include:

- **Avoided application redesign, totaling savings of \$1 million.** The composite

organization utilizes VMware's vMotion bidirectional live application migration to seamlessly transition its vSphere workloads to the cloud. The composite is able to use its existing Software Defined Data Center (SDDC) technologies to facilitate and manage migrations, avoiding the need to redesign applications or adopt new management tooling. The composite organization has a risk-adjusted savings of nearly \$1,200 per virtual machine (VM).

- **Reduced labor hours for infrastructure operations by 50%.** The composite organization eliminates physical servers and networking hardware, and it simplifies operating models, which creates reduced demand for operations staff. Teams spend 50% less time managing infrastructure operations and move on to higher-value tasks.
- **Lowered data center operating costs with 50% reduction in software licensing spend and 100% reduction in hardware refresh costs.** By retiring on-premises deployments, the composite organization is able to discontinue expenses for power, cooling, and maintenance. Additionally, the composite uses the migration to the cloud as an opportunity to consolidate networking and storage environments, which facilitates a reduction in licensing fees. Overall, the composite organization reduces data center operating costs by an average of 55.9% per year.
- **Achieved labor savings by using existing team skill sets.** The composite saves money by using existing team members familiar with the VMware ecosystem. This allows the composite to avoid hiring public cloud talent or extensive retraining for existing team members.
- **Saved time and money with 50% reduction in downtime.** VMware Cloud on AWS automates manual tasks such as managing physical hardware, patching, and updates, helping to

reduce the likelihood of outages and incidents for the composite organization.

Unquantified benefits. Benefits that are not quantified in this study include:

- **Modernized application portfolio.** Quickly moving to the cloud lets the organization access its application portfolio, explore modernization, and retire unnecessary technical debt.
- **Improved business resiliency.** Managing a global cloud deployment from a single source improves the organization's resilience to disruptive events.
- **More responsive and compliant security environment.** VMware Cloud on AWS automates many tasks that would require manual intervention in an on-premises environment.
- **Improved employee satisfaction.** Employees report a higher degree of job satisfaction with VMware Cloud on AWS due to fewer repetitive tasks and after-hours emergencies.

Costs. Three-year, risk-adjusted PV costs for the composite organization include:

- **VMware subscription costs.** The composite organization has a three-year licensing agreement for 23 I3 ESXi hosts in US East and a three-year Site Recovery Service plan. These costs total \$2.8 million over three years.
- **Internal training and deployment costs.** The composite incurs nominal internal labor hours for training, deployment, and annual refresher sessions. These costs total \$29,000 over three years.
- **Ongoing VMware management costs.** The composite incurs internal labor costs for the ongoing management of their vSphere-deployed workloads. Over a three-year period, these costs total \$1.3 million.

The representative interviews and financial analysis found that a composite organization experiences benefits of \$8.1 million over three years versus costs of \$4.1 million, adding up to a net present value (NPV) of \$4 million and an ROI of 99%.



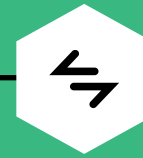
ROI
99%



BENEFITS PV
\$8.1 million



NPV
\$4 million



PAYBACK
13 months



AVERAGE ANNUAL DATA CENTER OPERATING COST REDUCTION²
55.9%



AVERAGE REDUCTION IN INFRASTRUCTURE AND OPERATIONS COSTS³
53.4%



MIGRATION SAVINGS AS A PERCENTAGE OF VMWARE ON AWS COSTS⁴
41%

“VMware Cloud on AWS really solved two issues for us: the expense of replacing all that hardware and the expense of retraining into native cloud infrastructures.”

— IT infrastructure director, public education

TEI FRAMEWORK AND METHODOLOGY

From the information provided in the interviews, Forrester constructed a Total Economic Impact™ framework for those organizations considering an investment in VMware Cloud on AWS.

The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision. Forrester took a multistep approach to evaluate the impact that VMware Cloud on AWS can have on an organization.

DISCLOSURES

Readers should be aware of the following:

This study is commissioned by VMware and delivered by Forrester Consulting. It is not meant to be used as a competitive analysis.

Forrester makes no assumptions as to the potential ROI that other organizations will receive. Forrester strongly advises that readers use their own estimates within the framework provided in the study to determine the appropriateness of an investment in VMware Cloud on AWS.

VMware reviewed and provided feedback to Forrester, but Forrester maintains editorial control over the study and its findings and does not accept changes to the study that contradict Forrester's findings or obscure the meaning of the study.

VMware provided the customer names for the interviews but did not participate in the interviews.



DUE DILIGENCE

Interviewed VMware stakeholders and Forrester analysts to gather data relative to VMware Cloud on AWS.



INTERVIEWS

Interviewed five representatives at organizations using VMware Cloud on AWS to obtain data with respect to costs, benefits, and risks.



COMPOSITE ORGANIZATION

Designed a composite organization based on characteristics of the interviewees' organizations.



FINANCIAL MODEL FRAMEWORK

Constructed a financial model representative of the interviews using the TEI methodology and risk-adjusted the financial model based on issues and concerns of the interviewees.



CASE STUDY

Employed four fundamental elements of TEI in modeling the investment impact: benefits, costs, flexibility, and risks. Given the increasing sophistication of ROI analyses related to IT investments, Forrester's TEI methodology provides a complete picture of the total economic impact of purchase decisions. Please see Appendix A for additional information on the TEI methodology.

The VMware Cloud On AWS Customer Journey

■ Drivers leading to the VMware Cloud on AWS investment

Interviews			
Role	Industry	Region	Revenue
IT infrastructure director	Public education	United States	\$168 million
Associate director of cloud infrastructure	Financial services	Global	\$3 billion
Senior managing director, security and technology services	Financial services	United States	\$1 billion
IT director CTO	Insurance	United States	\$500 million

KEY CHALLENGES

Forrester interviewed five respondents at four organizations using VMware Cloud on AWS. Prior to investing VMware Cloud on AWS, the organizations maintained physical on-premises data centers. The interviewees' organizations struggled with common challenges, including:

- **Aging hardware.** Interviewees noted that their organizations' hardware deployments required consistent refreshes to adequately meet infrastructure demands. At the time of their VMware Cloud on AWS investment, some organizations were on the cusp of large capital reinvestment in their hardware deployments.
- **Avoiding rearchitecting core applications and business disruptions.** Organizations desired moving to the cloud but recognized that in order to take advantage of cloud-native capabilities, they would have to retool or rearchitect their core applications. This presented a significant hurdle for organizations, as rearchitecting applications would disrupt business and require recruiting for new developer skills. The CTO of an insurance firm explained: "One key component to the decision-making was to limit our risk profile by staying within the VM hemisphere. We had worked over the years to go to 99% virtualized.

We already had that foundation, we already had the skill sets, and we already crossed all the hurdles to get our environment and our compute and storage running virtually."

The IT infrastructure director in public education added, "Moving to the cloud is no small task if you're going to have to restructure your workloads to a native environment."

"We were trying to get out of the hardware business. Every CIO handbook says you have to go cloud-native in order to get the right mix of expense and capability."

IT director, insurance

- **Streamlining infrastructure management.** Maintaining on-premises data centers created significant overhead for organizations related to tooling, patching, upgrades, hardware refreshes, and configuration management. The senior managing director of security and technology

services for a financial services firm explained, “[We hoped] to move closer to the applications, managing the configuration of applications and monitoring applications rather than the infrastructure.”

- **Facilitating a more agile business environment.** Interviewees were eager to leverage the flexibility and scalability of the cloud. Their organizations desired the ability to easily add capacity as well as accelerate new functionality and business capabilities. The associate director of cloud infrastructure for a financial services firm explained: “Modern applications require modern infrastructure. So today we’re upskilling we’re new-skilling, and we’re reskilling.”

“I’ve been trying to retire apps my whole time here and was not able to until we moved to the cloud [with VMware Cloud on AWS].”

Associate director of cloud infrastructure, financial services

- **Improving resiliency and disaster recovery times.** Interviewees searched for ways to improve the resiliency of their infrastructure. One organization’s main data center resided on an active fault line, which jeopardized the IT team’s ability to support ongoing operations. To mitigate risk, decision-makers concluded that a move to the cloud would provide the most insurance against catastrophe.

SOLUTION REQUIREMENTS

The interviewees’ organizations searched for a solution that could:

- Facilitate seamless transition to the cloud with limited business disruption.
- Utilize existing developer and infrastructure/operations skill sets.
- Reduce data center footprint.
- Enable data center extension during peak usage periods without incurring capital expenses.
- Facilitate development of new business initiatives.

“A transformational migration to VMware on AWS with our server workloads has allowed us to free ourselves from the constraints and delays of data center computing and has allowed us to focus on value-added business capabilities.”

IT director, insurance

COMPOSITE ORGANIZATION

Based on the interviews, Forrester constructed a TEI framework, a composite company, and an ROI analysis that illustrates the areas financially affected. The composite organization is representative of the five interviewees, and it is used to present the aggregate financial analysis in the next section. The composite organization has the following characteristics:

Description of composite. The composite organization is a global, multibillion-dollar enterprise operating in a B2B industry.

Deployment characteristics. Prior to investing in VMware Cloud on AWS, the composite organization maintained an on-premises VMware environment managed by eight engineers. The organization spent \$2 million annually on VM licenses and other networking software, with an additional \$1 million in data center consumption costs. The organization lacked cloud-native engineering skills at the time of its initial migration and had planned to refresh its data center in Year 3 of the business model. The organization migrates 800 VMs from its on-premises environment to VMware Cloud on AWS and retires 80 servers. The composite has a VMware Cloud on AWS deployment consisting of 23 ESXi hosts on I3 US East. The organization also has a three-year Site Recovery Service plan.

Key Assumptions

- **800 VMs migrated**
- **80 servers retired**
- **\$1 million annual data center consumption costs**
- **\$2 million annual software expenditures**
- **\$5,000 per minute cost of downtime**
- **Three-year plans for hosts and Site Recovery Service.**

Analysis Of Benefits

■ Quantified benefit data as applied to the composite

Total Benefits						
Ref.	Benefit	Year 1	Year 2	Year 3	Total	Present Value
Atr	Avoided application rearchitecture	\$1,018,400	\$0	\$0	\$1,018,400	\$925,818
Btr	Reduced labor hours for infrastructure operations	\$634,600	\$634,600	\$634,600	\$1,903,800	\$1,578,156
Ctr	Reduction in data center operating costs	\$1,330,000	\$1,425,000	\$2,660,000	\$5,415,000	\$4,385,274
Dtr	Labor savings using existing skill sets	\$60,800	\$0	\$0	\$60,800	\$55,273
Etr	Reduction in downtime	\$480,000	\$480,000	\$480,000	\$1,440,000	\$1,193,689
	Total benefits (risk-adjusted)	\$3,523,800	\$2,539,600	\$3,774,600	\$9,838,000	\$8,138,210

AVOIDED APPLICATION REARCHITECTURE

Evidence and data. Organizations migrated workloads from their on-premises software-defined data centers to the cloud in a seamless manner, avoiding the need to rearchitect applications for use with new tools. Maintaining operational consistency with existing vSphere deployments saved organizations hundreds of labor hours in migration work per application.

The IT director of an insurance firm explained: “[VMware Cloud on AWS] is a quick way of getting into the cloud. You don’t have to do as much QA when it comes to switching over the workloads because you are doing it at the hypervisor level, and you’re really only worried about performance and latency.” The CTO for the same organization added: “It’s way more expensive to rearchitect some of our applications to get them to run natively. There’s a big cost there with people having to go down into the code and make changes at the heart of the application to get it to run natively. Just from the QA perspective alone, we would have a minimum of 10 hours per server at \$100 per hour.”

Organizations saved time during the following migration phases:

- **Initial discovery phase:** engaging known stakeholders to do application dependency discovery. This includes network, systems, information security, application support, and application owners.
- **Adjacent team engagement:** engaging other teams that are discovered to have dependencies.
- **Migration planning:** discussing time of move, expected impact, and migration methods.
- **Migration engineering:** setting up DNS, load balancers, firewall rules, and migration scripts.
- **Migration execution:** all teams and stakeholders on deck for monitoring efforts and remedial actions such as firewall rules or permissions.

Modeling and assumptions. In modeling the benefits of avoided application rearchitecting, Forrester makes the following assumptions:

- The composite organization performs a burst migration, moving all workloads over the course of one year.
- The organization migrates 800 VMs.
- The average fully burdened annual salary of an IT team member is \$167,000, or \$80 per hour.

Risks. The savings from avoiding application rearchitecture will vary from organization to organization. Specific risk considerations include:

- Size, scope, and complexity of an organization's application portfolio.
- Prevailing labor rates.

Results. To account for these risks, Forrester adjusted this benefit downward by 5%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of \$926,000. With 800 VMs, this presents a savings of \$1,158 per VM.

“The time it would take, amount of change required, and the amount of new skills required, all of that [was] in favor of VMware Cloud.”

Senior managing director, security and technology services, financial services

Avoided Application Rearchitecture					
Ref.	Metric	Source	Year 1	Year 2	Year 3
A1	Number of VMs migrated	Composite	800		
A2	Hours for initial discovery per VM	Interviews	0.2		
A3	Members involved in discovery	Interviews	10		
A4	Subtotal: initial discovery person-hours	$A1 \cdot A2 \cdot A3$	1,600		
A5	Hours engaging adjacent application teams per VM	Interviews	0.2		
A6	Members involved in engagement	Interviews	5		
A7	Subtotal: adjacent team engagement person-hours	$A1 \cdot A5 \cdot A6$	800		
A8	Hours for migration planning per VM	Interviews	0.375		
A9	Members involved in planning	Interviews	10		
A10	Subtotal: migration planning person-hours	$A1 \cdot A8 \cdot A9$	3,000		
A11	Hours for migration engineering per VM	Interviews	1.5		
A12	Members involved in migration engineering	Interviews	4		
A13	Subtotal: migration engineering person hours	$A1 \cdot A11 \cdot A12$	4,800		
A14	Hours for migration execution per VM	Interviews	0.2		
A15	Members involved in migration execution	Interviews	20		
A16	Subtotal: migration execution person-hours	$A1 \cdot A14 \cdot A15$	3,200		
A17	Subtotal: total time spent on VM migration	$A4 + A7 + A10 + A13 + A16$	13,400		
A18	Average fully burdened hourly salary for IT team member	TEI standard	\$80		
At	Avoided application rearchitecture	$A17 \cdot A18$	\$1,072,000	\$0	\$0
	Risk adjustment	↓5%			
Atr	Avoided application rearchitecture (risk-adjusted)		\$1,018,400	\$0	\$0
Three-year total: \$1,018,400			Three-year present value: \$925,818		

REDUCED LABOR HOURS FOR INFRASTRUCTURE OPERATIONS

Evidence and data. Organizations found that their new, modern data center operations — enabled by VMware Cloud on AWS — required fewer labor hours to administer. Interviewees noted that they no longer needed resources to manage infrastructure or handle maintenance and monitoring tasks such as patching. With these workload reductions, team members could be refocused to higher-value tasks and, as the environment grows, new team members are not required for expansion.

- The IT infrastructure director in public education explained, “I probably would have needed to at least double the size of the team in order to maintain this environment [without VMware Cloud on AWS].”
- The insurance firm used the opportunity to reassign infrastructure management resources to its security operations team. The IT director at an insurance organization stated: “The focus of managing cloud infrastructure is far reduced, especially when it comes to all the security patching that needs to go on. That has allowed us to pivot a majority of the resources that we once had in infrastructure handling basic maintenance to our security operations team in order to respond to the growing needs there.”

- One financial services firm reallocated its resources to working on application stability and change requests — resulting in better application performance and fewer incidents. The organization now processes twice as many change requests with the same headcount. The senior managing director of security and technology services at a financial services firm detailed, “[The team is] more focused on application stability than infrastructure stability, and the number of incidents has gone down significantly in the past year.”

Modeling and assumptions. For the composite organization, Forrester assumes:

- The organization has an infrastructure team of eight resources managing its deployment.
- The average fully burdened annual salary for an infrastructure operations FTE is \$167,000.

Risks. The reduction in operations will vary with:

- Size, scope, and complexity of operations.
- Geography and prevailing labor rates.

Results. To account for these risks, Forrester adjusted this benefit downward by 5%, yielding a three-year, risk-adjusted total PV of \$1.6 million.

Reduced Labor Hours For Infrastructure Operations					
Ref.	Metric	Source	Year 1	Year 2	Year 3
B1	Infrastructure team members	Composite	8	8	8
B2	Reduction in operations labor hours	Interviews	50%	50%	50%
B3	Fully burdened annual salary for infrastructure operations FTE	TEI standard	\$167,000	\$167,000	\$167,000
Bt	Reduced labor hours for infrastructure operations	B1*B2*B3	\$668,000	\$668,000	\$668,000
	Risk adjustment	↓5%			
Btr	Reduced labor hours for infrastructure operations (risk-adjusted)		\$634,600	\$634,600	\$634,600
Three-year total: \$1,903,800			Three-year present value: \$1,578,156		

REDUCTION IN DATA CENTER OPERATING COSTS

Evidence and data. Migrating to the cloud enabled organizations to reduce their data center footprints, and in some cases, eliminate them entirely. Retiring physical hardware in data centers, i.e., from servers and supporting networking hardware, eliminated the need to pay for power, cooling, and maintenance staff. Cloud migration to improved infrastructure also enabled organizations to consolidate their server support for applications. In doing so, they were able to pare down the number of networking software licenses. In addition to discontinuing unnecessary software licenses, organizations avoided future hardware refreshes for end-of-life infrastructure.

- A financial services firm retired its on-premises data center and reduced its annual operating costs by 59%. The associate director of cloud infrastructure explained: “There’s other things you don’t think about; in order for clustering and things to work between them, we needed low-latency fiber, and data centers couldn’t be far apart. All that stuff we had to own, operate, and take care of. Meanwhile, multi-AZ is just there in [VMware Cloud on AWS]. Done, ready to go.” Additionally, the organization would have had to refresh its hardware had it not moved to the cloud, which saved roughly \$10 million in capital investment.
- An insurance firm eliminated 40% of its data center footprint — discontinuing upkeep of hardware and saving \$6,343 a month in power costs. The organization also had a substantial amount of hardware up for renewal, and to achieve the same capabilities it now has with VMware Cloud on AWS it would have had to invest an estimated \$3 million over three years. The IT director explained: “We reduced power and square footage from our colocation. But

ultimately, when we went into this, it wasn’t to save money. It was about flattening our costs while improving capabilities. We reduced the risk of having our own data center, even if it was [colocated] — which was not something we wanted to manage or deal with the hardware and software refresh cycle.”

- Another financial services firm retired its on-premises SDDCs and saved hundreds of thousands of dollars on power, cooling, and upkeep a year — which accounted for 10% of the organization’s technology budget.

Modeling and assumptions. In modeling the reduction in data center operating costs, Forrester makes the following assumptions:

- The organization retires 80 servers valued at \$15,000 each.
- The organization has annual data center consumption costs of \$1 million and data center software costs of \$2 million.
- The hardware refresh cycle occurs in Year 3 of the model.

Risks. Data center operating savings will vary by organization. Specific risk considerations include:

- Size of existing data center footprint.
- Geographic location and prevailing market rates for electricity.
- Age of current infrastructure and organizational refresh policy.
- Organizational software needs and corresponding spend.

Results. To account for these risks, Forrester adjusted this benefit downward by 5%, yielding a three-year, risk-adjusted total PV of \$4.4 million.

Reduction In Data Center Operating Costs					
Ref.	Metric	Source	Year 1	Year 2	Year 3
C1	Annual data center consumption costs	Composite	\$1,000,000	\$1,000,000	\$1,000,000
C2	Reduction in data center consumption costs with VMware on AWS	Interviews	40%	50%	60%
C3	Subtotal: data center consumption savings with VMware Cloud on AWS	C1*C2	\$400,000	\$500,000	\$600,000
C4	Annual software expenditures	Composite	\$2,000,000	\$2,000,000	\$2,000,000
C5	Percentage reduction in software licenses spend	Interviews	50%	50%	50%
C6	Subtotal: annual software expenditure savings with VMware on AWS	C4*C5	\$1,000,000	\$1,000,000	\$1,000,000
C7	Avoided storage hardware refresh	Composite			\$1,200,000
C8	Avoided hardware refresh with VMware on AWS	Interviews			100%
C9	Subtotal: hardware cost avoidance	C7*C8			\$1,200,000
Ct	Reduction in data center operating costs	C3+C6+C9	\$1,400,000	\$1,500,000	\$2,800,000
	Risk adjustment	↓5%			
Ctr	Reduction in data center operating costs (risk-adjusted)		\$1,330,000	\$1,425,000	\$2,660,000
Three-year total: \$5,415,000			Three-year present value: \$4,385,274		

LABOR SAVINGS USING EXISTING SKILL SETS

Evidence and data. Interviewees highlighted the benefit of VMware Cloud on AWS using technology that their employees were already readily familiar with. Due to this familiarity, the organizations did not require extensive retraining for their workforce to operate the new environment, nor did they need to undergo the expensive process of recruiting employees with cloud-native skills. Interviewees estimated that they avoided 200 hours of training per resource by using existing skills.

- The IT infrastructure director in public education explained: “It’s pretty important to understand that one of the advantages was not having to retrain staff or gain new employees to manage

VMware Cloud on AWS. They were already familiar with the product.”

Modeling and assumptions. In modeling the benefit Forrester assumes:

- An average fully burdened hourly labor rate of \$80.

Risks. Results will vary by organization. Specific risk considerations include:

- Existing skill sets of the workforce.
- Prevailing labor rates.

Results. To account for these risks, Forrester adjusted this benefit downward by 5%, yielding a three-year, risk-adjusted total PV of \$55,000

Labor Savings Using Existing Skill Sets					
Ref.	Metric	Source	Year 1	Year 2	Year 3
D1	Core infrastructure team	B1*50%	4		
D2	Hours of training required for cloud native management	Interviews	200		
D3	Average fully burdened hourly labor rate	TEI standard	\$80		
Dt	Labor savings using existing skill sets	D1*D2*D3	\$64,000		
	Risk adjustment	↓5%			
Dtr	Labor savings using existing skill sets (risk-adjusted)		\$60,800	\$0	\$0
Three-year total: \$60,800			Three-year present value: \$55,273		

REDUCTION IN DOWNTIME

Evidence and data. Prior to investing in VMware Cloud on AWS, organizations had to monitor infrastructure performance themselves and react when problems arose. With VMware Cloud on AWS, VMware handles monitoring and addresses upgrades and patches that previously caused issues for organizations.

- Since adopting VMware Cloud on AWS, the public university has experienced zero downtime events or outages. Previously, the organization saw at least two to three interruptions per year due to hardware failures. The IT infrastructure director explained: “The other thing not realized here is the time saved by VMware performing the upgrades for you. You simply get a notice that there’s an upgrade scheduled — it’s completely hands-off. We know [VMware is] covering it, and we get notifications of when the upgrade is completed. These noninterruptions are hard to measure because we couldn’t keep up with that kind of patch level in our on-premises environment. We just couldn’t afford the time to do that.”
- Previously, a financial services firm needed to strictly monitor infrastructure performance and rely on its management vendor to reactively fix issues. With VMware Cloud on AWS, the organization could monitor the entire deployment with a single pane of glass and relied on automation to proactively address issues. The associate director of cloud infrastructure stated: “I thought it was going to be a little weird not

being able to touch my OS and not run my statistics against them or stay on top of them the way I always had. But the fact is, if have a problem, I don’t have to touch them — it’s like magic. It’s one of the coolest things about the cloud; I’ve literally been watching my SDDC, and one of the hosts is in trouble, and it automatically gets shut down or paused. All the loads are spread across the other hosts, everything is rebalanced, and I didn’t touch a thing.”

Modeling and assumptions. In modeling this benefit, Forrester assumes:

- Prior to investment in VMware Cloud on AWS, the composite organization experiences two significant outages a year, each with an average length of 2 hours.
- The average cost of downtime for the organization is \$5,000 per minute.

Risks. The value of downtime reduction will vary by organization. Specific risk considerations include:

- The length and frequency of downtime events in the prior state.
- The average per-minute cost of downtime will vary widely based on industry and region. Organizations that derive revenue from critical customer-facing applications could experience significant per-minute losses, while those without may experience far lower ramifications.

Results. To account for these risks, Forrester adjusted this benefit downward by 20%, yielding a three-year, risk-adjusted total PV of \$3 million.

Reduction In Downtime					
Ref.	Metric	Source	Year 1	Year 2	Year 3
E1	Annual number of significant downtime incidents	Composite	2	2	2
E2	Average length of downtime (hours)	Composite	2	2	2
E3	Average cost of downtime per minute	Composite	\$5,000	\$5,000	\$5,000
E4	Average cost of downtime	$E1*(E2*60)*E3$	\$1,200,000	\$1,200,000	\$1,200,000
E5	Reduction in downtime with VMware Cloud on AWS	Interviews	50%	50%	50%
Et	Reduction in downtime	$E4*E5$	\$600,000	\$600,000	\$600,000
	Risk adjustment	↓20%			
Etr	Reduction in downtime (risk-adjusted)		\$480,000	\$480,000	\$480,000
Three-year total: \$1,440,000			Three-year present value: \$1,193,689		

UNQUANTIFIED BENEFITS

Additional benefits that customers experienced but were not able to quantify include:

- **Modernized application portfolio.** Quickly moving to the cloud allowed the organization to access its application portfolio, explore modernization, and retire unnecessary technical debt. This enabled the organization to shift development resources from supporting older applications to producing new features and discontinuing infrastructure support costs.

The associate director of cloud infrastructure for a financial services firm explained: “Since we moved to the cloud, we’ve been able to retire 19 applications. It allowed at least six dev teams to stop work on them and created a whole bunch of capacity we are reinvesting into more modernization or retirement. Retiring the 19 apps also allowed me to delete four hosts across two SDDCs, which was about \$200,000 in annual spend.”

- **Improved business resiliency.** Moving to the cloud afforded organizations increased resiliency to disasters they might otherwise be susceptible to. Additionally, being able to manage a global cloud environment from a single source increases reaction time when issues arise.

Interviewees’ organizations highlighted the benefit of having a cloud deployment during the COVID-19 pandemic, when travel restrictions would have limited their ability to support on-premises deployments. The associate director of cloud infrastructure for a financial services firm explained: “We have 35 district offices with some smaller data centers in the US, Singapore, Tokyo, and London. We had no ability to get anyone into Singapore, and we were good in London for like a month. Conceptually, being in the cloud makes us not worry about that.”

The public university had had a physical data center on an active fault line. Migrating to the cloud solved this issue immediately and eliminated any future geologic concerns.

- **More responsive and compliant security environment.** Organizations were better able to stay up to date with patches and upgrades due to automations provided by VMware Cloud on AWS. Additionally, organizations redeployed resources no longer needed to manage infrastructure to security-related work and improved their overall security posture.

The IT director of an insurance firm stated: “[With VMware Cloud on AWS], we were notified before we knew that a risk existed, and it was already patched. From that perspective, [VMware Cloud on AWS] has made us more responsive and more compliant with any emerging risk in the security environment.”

- One financial services firm redeployed some resources from infrastructure management to critical tasks such as testing for and patching vulnerabilities, which it did not always have bandwidth to complete with its existing headcount. After migration, the organization had the capacity to reduce the average number of unpatched vulnerabilities from 10% to 5%. The interviewee explained: “We’ve seen the results in our external penetration testing. With the last annual test, we improved significantly and had no critical findings.”
- **Improved employee morale.** Interviewees noted that their employees reported higher job satisfaction because they spent less time on repetitive tasks and had to handle fewer emergencies outside of work hours. Resources were also using the time to train up on native cloud skills and further their career development. The CTO of an insurance firm stated: “VMware Cloud on AWS has allowed us to invest in our own employees and give them the ability to not

have to jump in with both feet to learn the cloud. It's definitely given us a longer runway for us to build up the skill sets we need to be a more cloud-native company. We already have three or four individuals now with AWS certification, and it's allowed them to grow into that versus us having to go out and hire expertise."

FLEXIBILITY

The value of flexibility is unique to each customer. There are multiple scenarios in which a customer might implement VMware Cloud on AWS and later realize additional uses and business opportunities, including:

- **Expand use cases and migrate additional workloads to the cloud.** Multiple organizations expressed interest in migrating their existing virtual desktop infrastructure (VDI) deployments to VMware Cloud on AWS. By extending their existing on-premises VDI environment to the cloud, organizations could further optimize infrastructure costs.
- **Innovate with VMware Tanzu.** With VMware Tanzu, developers can create and deliver software faster by automatically deploying application code to an elastic, scalable, and fully managed cloud infrastructure platform. The automation, security, and scalability features not only shorten software release times but simplify and automate technology operations as well.

Flexibility would also be quantified when evaluated as part of a specific project (described in more detail in [Appendix A](#)).

Analysis Of Costs

■ Quantified cost data as applied to the composite

Total Costs							
Ref.	Cost	Initial	Year 1	Year 2	Year 3	Total	Present Value
Ftr	VMware subscription	\$0	\$3,036,209	\$0	\$0	\$3,036,209	\$2,760,190
Gtr	Internal training and deployment costs	\$25,200	\$1,680	\$1,680	\$1,680	\$30,240	\$29,378
Htr	Ongoing VMware Cloud on AWS management costs	\$0	\$526,050	\$526,050	\$526,050	\$1,578,150	\$1,308,208
Total costs (risk-adjusted)		\$25,200	\$3,563,939	\$527,730	\$527,730	\$4,644,599	\$4,097,776

VMWARE SUBSCRIPTION

Evidence and data. Interviewees incurred subscription costs for usage of VMware Cloud on AWS based on the number of hosts, host type, and plan. Deployment sizes varied based on the number of VMs and workload types.

VMware offers one-year, three-year, and on-demand pricing models as well as volume discounts to meet the varying needs of organizations.

Modeling and assumptions. The composite organization has a VMware Cloud on AWS deployment of 23 I3 ESXi hosts in US East. The organization also has Site Recovery Service and pays for both on a three-year plan.

Risks. Forrester recognizes that certain factors can impact the annual fees an organization pays for VMware Cloud on AWS. Specific risk considerations include:

- Contract structure.
- Number of hosts and region.
- Applicable discounts.

Results. To account for these risks, Forrester adjusted this cost upward by 20%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of \$2.8 million.

VMware Subscription						
Ref.	Metric	Source	Initial	Year 1	Year 2	Year 3
F1	Annual fees paid to VMware	Composite		\$2,760,190		
Ft	VMware subscription	F1	\$0	\$2,760,190	\$0	\$0
	Risk adjustment	↑10%				
Ftr	VMware subscription (risk-adjusted)		\$0	\$3,036,209	\$0	\$0
Three-year total: \$3,036,209			Three-year present value: \$2,760,190			

INTERNAL TRAINING AND DEPLOYMENT COSTS

Evidence and data. Organizations spent minimal time training their teams for deployment, as they were able to leverage already-existing skill sets. Deployment times varied, with organizations taking different approaches — phased and burst — to their rollout. However, all organizations were deployed and in production in well under one year.

Modeling and assumptions. The composite organization requires 300 cumulative labor hours across teams to communicate and train for the migration. Furthermore, the organization holds annual refresher courses for new hires and new feature releases.

Risks. Implementation risk is the risk that the proposed investment may deviate from the original or expected requirements, resulting in higher costs than anticipated. The greater the uncertainty, the wider the potential range of outcomes for cost estimates.

Specific risk considerations include:

- Size and scope of operations.
- Prevailing labor market rates.

Results. To account for these risks, Forrester adjusted this cost upward by 10%, yielding a three-year, risk-adjusted total PV of \$29,000.

Internal Training And Deployment Costs						
Ref.	Metric	Source	Initial	Year 1	Year 2	Year 3
G1	Person-hours required to train and deploy on AWS	Composite	300	20	20	20
G2	Average fully burdened hourly rate for team members	TEI standard	\$80	\$80	\$80	\$80
Gt	Internal training and deployment costs	G1*G2	\$24,000	\$1,600	\$1,600	\$1,600
	Risk adjustment	↑5%				
Gtr	Internal training and deployment costs (risk-adjusted)		\$25,200	\$1,680	\$1,680	\$1,680
Three-year total: \$30,240			Three-year present value: \$29,378			

ONGOING VMWARE CLOUD ON AWS MANAGEMENT COSTS

Modeling and assumptions. The composite organization employs four full-time employees, who dedicate 75% of their capacity to the ongoing management of their VMware Cloud on AWS deployment. In modeling this cost, Forrester assumes an average fully burdened salary for FTEs managing VMware Cloud of \$167,000.

Risks. Ongoing VMware management costs will vary based on:

- Size and scope of deployment.
- Prevailing labor rates.

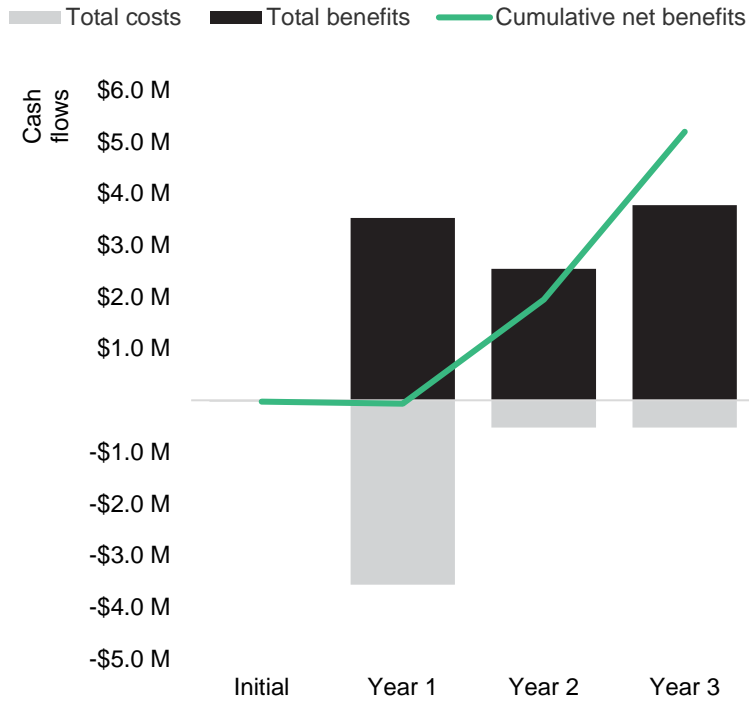
Results. To account for these risks, Forrester adjusted this cost upward by 5%, yielding a three-year, risk-adjusted total PV of \$1.3 million.

Ongoing VMware Cloud On AWS Management Costs						
Ref.	Metric	Source	Initial	Year 1	Year 2	Year 3
H1	Staff managing VM deployment	Composite		4	4	4
H2	Percentage of time spent on VMware Cloud deployment	Composite		75%	75%	75%
H3	Average fully burdened salary for deployment staff	TEI standard		\$167,000	\$167,000	\$167,000
Ht	Ongoing VMware Cloud on AWS management costs	H1*H2*H3		\$501,000	\$501,000	\$501,000
	Risk adjustment	↑5%				
Htr	Ongoing VMware Cloud on AWS management costs (risk-adjusted)		\$0	\$526,050	\$526,050	\$526,050
Three-year total: \$1,578,150			Three-year present value: \$1,308,208			

Financial Summary

CONSOLIDATED THREE-YEAR RISK-ADJUSTED METRICS

Cash Flow Chart (Risk-Adjusted)



The financial results calculated in the Benefits and Costs sections can be used to determine the ROI, NPV, and payback period for the composite organization's investment. Forrester assumes a yearly discount rate of 10% for this analysis.

These risk-adjusted ROI, NPV, and payback period values are determined by applying risk-adjustment factors to the unadjusted results in each Benefit and Cost section.

Cash Flow Analysis (Risk-Adjusted Estimates)

	Initial	Year 1	Year 2	Year 3	Total	Present Value
Total costs	(\$25,200)	(\$3,563,939)	(\$527,730)	(\$527,730)	(\$4,644,599)	(\$4,097,776)
Total benefits	\$0	\$3,523,800	\$2,539,600	\$3,774,600	\$9,838,000	\$8,138,210
Net benefits	(\$25,200)	(\$40,139)	\$2,011,870	\$3,246,870	\$5,193,401	\$4,040,434
ROI						99%
Payback period (months)						13

Appendix A: Total Economic Impact

Total Economic Impact is a methodology developed by Forrester Research that enhances a company's technology decision-making processes and assists vendors in communicating the value proposition of their products and services to clients. The TEI methodology helps companies demonstrate, justify, and realize the tangible value of IT initiatives to both senior management and other key business stakeholders.

TOTAL ECONOMIC IMPACT APPROACH

Benefits represent the value delivered to the business by the product. The TEI methodology places equal weight on the measure of benefits and the measure of costs, allowing for a full examination of the effect of the technology on the entire organization.

Costs consider all expenses necessary to deliver the proposed value, or benefits, of the product. The cost category within TEI captures incremental costs over the existing environment for ongoing costs associated with the solution.

Flexibility represents the strategic value that can be obtained for some future additional investment building on top of the initial investment already made. Having the ability to capture that benefit has a PV that can be estimated.

Risks measure the uncertainty of benefit and cost estimates given: 1) the likelihood that estimates will meet original projections and 2) the likelihood that estimates will be tracked over time. TEI risk factors are based on "triangular distribution."

The initial investment column contains costs incurred at "time 0" or at the beginning of Year 1 that are not discounted. All other cash flows are discounted using the discount rate at the end of the year. PV calculations are calculated for each total cost and benefit estimate. NPV calculations in the summary tables are the sum of the initial investment and the discounted cash flows in each year. Sums and present value calculations of the Total Benefits, Total Costs, and Cash Flow tables may not exactly add up, as some rounding may occur.



PRESENT VALUE (PV)

The present or current value of (discounted) cost and benefit estimates given at an interest rate (the discount rate). The PV of costs and benefits feed into the total NPV of cash flows.



NET PRESENT VALUE (NPV)

The present or current value of (discounted) future net cash flows given an interest rate (the discount rate). A positive project NPV normally indicates that the investment should be made unless other projects have higher NPVs.



RETURN ON INVESTMENT (ROI)

A project's expected return in percentage terms. ROI is calculated by dividing net benefits (benefits less costs) by costs.



DISCOUNT RATE

The interest rate used in cash flow analysis to take into account the time value of money. Organizations typically use discount rates between 8% and 16%.



PAYBACK PERIOD

The breakeven point for an investment. This is the point in time at which net benefits (benefits minus costs) equal initial investment or cost.

Appendix B: Endnotes

¹ Total Economic Impact is a methodology developed by Forrester Research that enhances a company's technology decision-making processes and assists vendors in communicating the value proposition of their products and services to clients. The TEI methodology helps companies demonstrate, justify, and realize the tangible value of IT initiatives to both senior management and other key business stakeholders.

² Average composite reduction on data center operating costs (consumption costs, software expenditures, and hardware costs) per year.

³ Total savings from reduction in labor costs, data center operating costs, and downtime.

⁴ Migration costs avoided in Year 1 as a percentage of investment in VMware Cloud on AWS.

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