



# The Business Value of Amazon Web Services: North America

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## BUSINESS VALUE HIGHLIGHTS



Click on highlights below to navigate to related content within this PDF.

**512%**  
five-year ROI

**10 months**  
to payback

**56%**  
lower five-year cost  
of operations

**22%**  
lower cost of  
infrastructure

**63%**  
more efficient IT  
infrastructure teams

**84%**  
fewer unplanned outages

**79%**  
faster deployment of new  
compute/storage resources

**2.4x**  
new applications and features  
delivered per year

**\$96.0**  
million higher revenue enabled  
per year per organization

## Executive Summary

IDC research shows that leaders across IT and the business increasingly view cloud providers as strategic technology partners in today's digital-first world. They are choosing cloud providers for faster access to technologies spanning compute services, data services, application framework services, and usage multiplier services including governance and security. Yet, increasingly, cloud selection processes are going beyond technology considerations to look more deeply at the business value benefits.

IDC expects that by 2023, 40% of the G2000 will reset cloud selection processes to focus on business outcomes rather than IT requirements. Organizational leaders are increasingly expecting cloud providers to partner with them as they migrate on-premises estates to the cloud and make the transition to cloud-native development and governance, including both cost governance and IT governance. CIOs and CTOs will require cloud providers to help them achieve business case goals directly related to corporate strategy. Business value studies are an important part of that objective.

IDC interviewed 14 North American organizations about their experiences using Amazon Web Services (AWS) to run many of their most business-critical applications and services. These North America-based customers spoke to the strong value they are achieving with AWS compared with their legacy on-premises environments. Specifically, they reported establishing a more cost-effective, efficient, agile, and high-performing infrastructure foundation for their business operations with AWS.

**Based on these interviews, IDC calculates that interviewed organizations will realize a 512% five-year ROI by:**

- ▶ **Optimizing spending** on compute, storage, and other IT resources
- ▶ **Empowering IT teams** to work more efficiently and focus on innovative and business-driven activities
- ▶ **Increasing the value of development teams** by providing them with agile and frictionless access to testing and development resources and enhancing their ability to deploy and update new applications and features
- ▶ **Decreasing risk-related costs** by reducing the impact on business operations of unplanned outages and security vulnerabilities
- ▶ **Capturing more revenue and improving business results** by establishing and maintaining competitive differentiation in the quality of their products and services, accelerating revenue cycles by speeding up development times, and leveraging new technologies to drive business outcomes

## Situation Overview

Using lessons learned from ecommerce where fluctuating demand for computing resources is a given, Amazon kicked off the Amazon Web Services initiative in 2006. Service-oriented architecture (SOA) gained popularity in the mid-1990s to reduce the complexity of software by breaking them up into components delivered as services and connected through common standards. The SOA experience that predated the AWS launch gave Amazon an advantage in building a distributed services architecture offering that fits very well with end-user needs. Using customer feedback, the services offered by AWS have expanded from the initial portfolio that delivered base infrastructure services to higher-end services that are all based on a highly available infrastructure delivered in an abstracted and automated fashion. AWS also provides customers with multiple migration tools to assist them to move compute and database workloads to the public cloud. The success of Amazon is demonstrated by Amazon moving from number 29 on the Fortune 500 list in 2015 to number 2 in 2021.

## Business Challenges

Lower-cost, cloud-delivered services combined with agility from open source and cloud-native application development tools are leading to lower infrastructure and labor costs for organizations along with faster ability to serve customer needs. As a result, businesses that fail to take advantage of technological innovation often struggle to maintain their competitive advantage because technology innovation and competitiveness are tightly linked.

To surpass competition, today's CEO, CIO, and CTO have to handle the complex task of digitally transforming the entire organization while leveraging technology that is changing at a much faster pace than any time before. The related transition to cloud-native development and governance, including both cost governance and IT governance, impacts both legacy applications and net-new application development. This is resulting in impacts at all levels of business and IT strategy, and cloud providers and the wider cloud partner ecosystem are stepping up to serve strategic partnership roles with their customers.

## Key Cloud Revenue Growth Trends

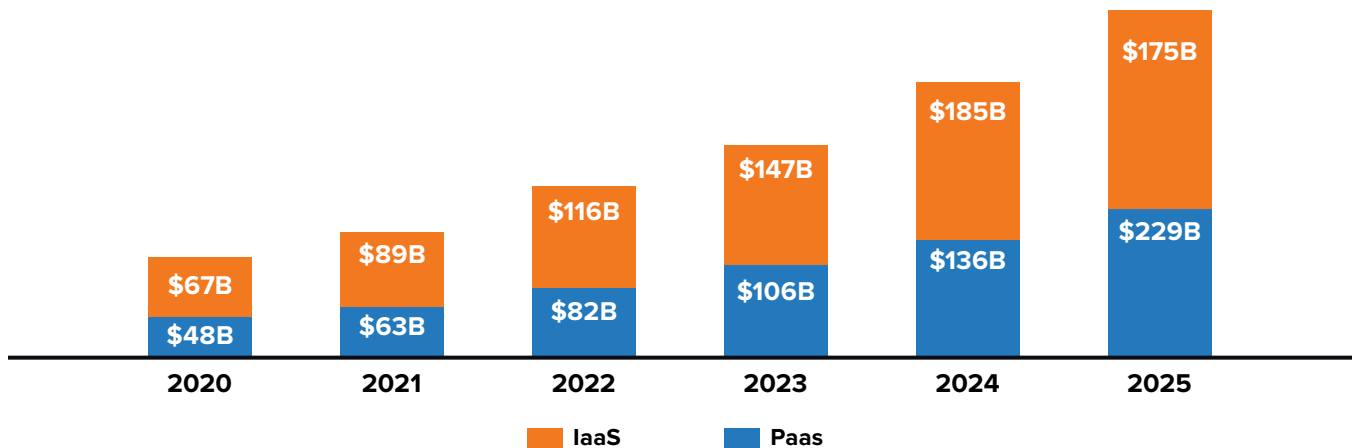
To provide context about cloud growth, **Figure 1** (next page) shows the worldwide cloud vendor revenue forecast in infrastructure as a service (IaaS) and platform as a service (PaaS) from 2020 to 2025. Together, IaaS and PaaS are projected to grow at a healthy compound annual growth rate (CAGR) of 29% from 2020 to 2025, from just over \$100 billion in 2020 to reach \$400 billion in 2025. The continued growth in revenue in the cloud market illustrates the significant appetite organizations have for cloud adoption. It speaks to the value that organizations place on agility gained by developing and deploying applications via cloud services.

AWS held 46.3% of the IaaS market in 2020, growing at 32% year over year, and held 15% of the PaaS market, growing at 30% year over year. These market shares and growth rates indicate the success customers are finding with AWS.

**FIGURE 1**

### Worldwide Whole Cloud Revenue by Consumption Model, 2020–2025

(\$B per year)



Note: For more details, see *Worldwide Whole Cloud Forecast, 2021-2025: The Path Ahead for Cloud in a Digital-First World* (IDC #US47397521, September 2021), *Worldwide Public Cloud Infrastructure as a Service Market Shares, 2020: Data Growth, Edge Use Cases, and Hybrid Deployment Take Center Stage* (IDC #US47350821, July 2021), and *Worldwide Competitive Public Cloud Platform as a Service Market Shares, 2020: The Demand for Application Development Leveraging PaaS Continues Strong Across Vendors as DX Accelerates* (IDC #US48033221, July 2021).



# Amazon Web Services

Amazon Web Services started as a result of responding to Amazon’s large-scale ecommerce operations’ need for a highly scalable infrastructure. In the early days, primarily a set of low-level services like Amazon Elastic Compute Cloud (Amazon EC2) and Amazon Simple Storage Service (Amazon S3) was abstracting the infrastructure for users. The delivery of cloud-delivered services led to rapid adoption by start-ups that found the platform to be flexible, agile, extensible, and available at a low cost. Responding to continuously evolving customer needs, over a period of time, Amazon built a wide array of higher-level services, leading to increased adoption by enterprises that found value in modernization and the benefits of decreased costs, increased productivity, and improved resilience and agility. **Figure 2** (next page) shows AWS’s portfolio of services.

**FIGURE 2**  
**Overview of AWS Services**



Source: AWS, 2022

# The Business Value of Amazon Web Services

## Study Demographics and Methodology

IDC conducted research that explored the value and benefits for organizations using Amazon Web Services through in-depth interviews with 14 organizations based in North America, all running enterprise-level workloads on AWS. Questions asked of organization representatives were both qualitative and quantitative in nature and designed to assist in developing an in-depth, nontheoretical understanding of the impact of AWS upon IT processes, business operations, and costs (For additional details on IDC's Methodology, please see the Appendix).

**Table 1** (next page) presents study firmographics for the interviewed AWS customers. Collectively, interviewed organizations had the profile of a large enterprise with an average of 45,029 employees (median of 18,500), with annual revenue averaging \$16.9 billion (median of \$5 billion). Though all the companies participating in the study are based in the United States, they represent a diverse sampling of industry verticals, including biotechnology, financial services, government, healthcare, insurance, media and entertainment, manufacturing, and transportation.

**TABLE 1**  
**Demographics of Interviewed Organizations**

	Average	Median
<b>Number of employees</b>	45,029	18,500
<b>Number of IT staff</b>	5,687	1,500
<b>Number of business applications</b>	480	200
<b>Annual revenue/budget</b>	\$16.9B	\$5.0B
<b>Countries</b>	United States (14)	
<b>Industries</b>	Financial services (4), transportation (2), biotechnology (2), manufacturing, government, healthcare, insurance, media and entertainment, and medical device manufacturing	

n = 14; Source: IDC in-depth interviews, September 2021

## Choice of Amazon Web Services

The North American customers interviewed by IDC described the drivers of their choice of AWS over refreshing on-premises environments or moving to other cloud solutions. Reliability and scalability were key differentiators, as were the flexibility and capabilities AWS provide in terms of adopting and leveraging the benefits of new technologies. The breadth of functionality offered by AWS in comparison to competing solutions was also a recurring theme among the interviewed organizations.

### These differentiators helped motivate the selection of AWS over competitors' offerings:

▶ **Scalability enabling the matching of capacity to actual demand, IT manager, financial services:**

*"We chose AWS for overall infrastructure provisioning capabilities and to be able to scale up and scale down. Previously, our environment was pretty static, and we always had to build for peak capacity because there wasn't enough elasticity."*

▶ **Ability to use new technologies to drive business, director, IT operations and logistics, transportation:**

*"Cost was secondary to an innovation standpoint with machine learning and artificial intelligence (AI) in our choice of AWS — in particular, we considered some of the competitive things we wanted to be able to do in the marketplace."*

▶ **Higher functionality for price than public cloud competitor, IT manager, financial services:**

*"Most of our applications were on premises before AWS. We looked at [another major cloud vendor], but we felt that we got better bang for our buck with AWS and more functionality that [the competitor] couldn't offer at that time. For pricing, it was similar, but we just thought AWS was better."*

## Use of Amazon Web Services by Interviewed Organizations

Organizations participating in the study reported metrics that indicate a substantial degree of reliance upon AWS service offerings for their overall business activities. **Table 2** (next page) details the averages and medians for a range of those metrics quantifying their use of AWS. A key indicator of the extent of study participants' use of AWS is their spend levels, with average annual spend of more than \$6.6 million and median of more than \$2.1 million.

The reported metrics also spotlight the benefit of AWS scalability in terms of increasing and decreasing capacity as the organizations reported an average number of 924 EC2 instances (median 288) with a maximum of 1,281 (median 400). The range between average and maximum EC2 instances demonstrates the degree to which they are leveraging the scalability afforded by AWS to scale up or down to efficiently accommodate fluctuating business needs. On average, study participants reported running just under half of their applications in the public cloud (49%), with more than three-quarters (76%) of those applications running on AWS. Meanwhile, the fact that interviewed organizations linked their AWS environments to more than three-fifths (63%) of business revenue on average reflects the extent to which their use of AWS influences and drives business results.



**TABLE 2**  
**AWS Use by Interviewed Organizations**

	Average	Median
Annual spend on AWS	\$6.6M	\$2.1M
Business applications running in the public cloud	49%	45%
Applications in public cloud running on AWS	76%	90%
Average number of AWS EC2 instances	924	288
Maximum number of AWS EC2 instances	1,281	400
Number of databases	178	125
Number of terabytes of storage	6,589	100
Number of applications	116	50
Number of users of applications	18,841	2,500
Revenue supported	63%	75%

n = 14; Source: IDC interviews, September 2021

## Business Value and Quantified Benefits of Amazon Web Services

North American organizations interviewed for this study reported leveraging various Amazon Web Services solutions to make their IT operations more cost effective and efficient while taking advantage of new technologies, enhanced scalability, and flexibility to establish and maintain business differentiation.

**Study participants provided numerous examples that linked their ability to run IT environments more efficiently and cost effectively while still enabling their businesses, including:**

► **Scalability and costs that align with performance and use, IT manager, medical device manufacturing:**

*“With AWS, we have improved performance, reliability, and enhanced flexibility. For example, during COVID-19, we were able to scale the system and server utilization and pay less.”*

▶ **Move to opex IT model and improved rationalization of IT-related spending, global director, BI, healthcare:**

*“One big benefit of moving to AWS was turning our cost model from a capex- to opex-heavy model ... This is a big benefit because it helps our business rationalize the costs of existing applications as well as for developing new applications.”*

▶ **Nimble infrastructure that improves time to market, enterprise cloud and security manager, government:**

*“The big thing with AWS is just the nimble nature. We used to have to buy storage and servers, but we can scale now more easily, and that helps with our time to market.”*

**IDC’s interviews with North American AWS customers estimate that they will achieve benefits worth an annual average of \$52,800 per AWS EC2 virtual instance (\$48.8 million per organization) in the areas described in Figure 3 (next page):**

▶ **IT staff productivity gains:**

Study participants reported enhancing the capabilities and value of IT teams such as infrastructure, help desk, security, and development teams. For purposes of this analysis, IDC classified development team productivity gains as IT staff-related benefits, although improved development throughput and timeliness also clearly supports better business results. IDC calculates that interviewed AWS customers will realize staff efficiencies worth an annual average of \$28,400 per AWS EC2 virtual instance (\$26.2 million per organization).

▶ **Business productivity benefits:**

Study participants achieve better business results through competitive differentiation with AWS with improved product and service capabilities. IDC puts the value of higher net revenue and productivity at an average of \$14,600 per AWS EC2 virtual instance per year (\$13.5 million per organization).

▶ **Risk mitigation benefits:**

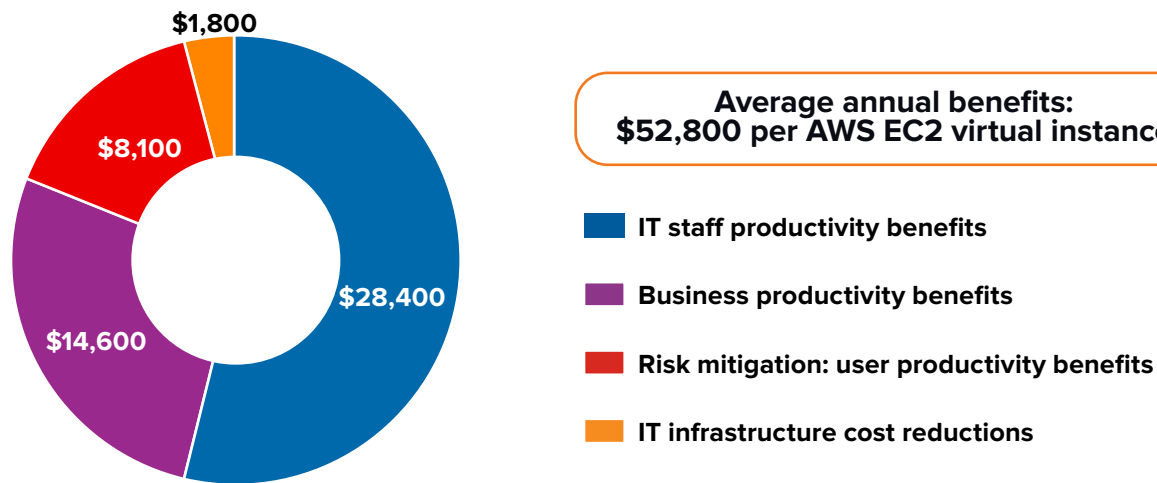
Study participants minimize operational risk, which reduces costs related to unplanned outages and security issues. IDC values higher net revenue and productivity achieved by reducing risk as worth \$8,100 per AWS EC2 virtual instance per year (\$7.5 million per organization).

▶ **IT infrastructure cost reductions:**

Study participants optimize the costs of providing IT resources to their businesses with AWS. IDC estimates that they will save an annual average of \$1,800 per AWS EC2 virtual instance (\$1.6 million per organization).

### FIGURE 3 Average Annual Benefits per EC2 Virtual Instance

(\$ per EC2 virtual instance)



n = 14; Source: IDC in-depth interviews, September 2021

## Lower Cost of Operations

While organizations increasingly expect IT organizations to drive business growth, they nonetheless still commonly seek to optimize IT costs. This means making cost-effective use of IT resources such as compute, storage, and network capacity and maximizing the value of skilled IT teams responsible for providing IT services. Interviewed North American customers reported capturing significant cost and staff efficiencies with AWS compared with on-premises environments. IDC estimates that they will save an average of 56% with AWS across these two categories over five years (refer to **Figure 6** on page 16).

## Optimizing Spending on IT Infrastructure Resources

Interviewed organizations reported striking differences in the cost of delivering IT infrastructure capacity to support business operations with AWS versus on-premises environments. The ability to better match capacity to actual use with AWS was a common theme. Further, the ability to adopt and leverage new technologies such as containerization and microservices that maximize the utility of compute and other IT resources was also cited by multiple organizations. A number of study participants also noted better visibility into usage along with licensing efficiencies.

One interviewee explained that, at an initial review, a cost comparison between on premises and AWS might initially appear to favor on premises, but that in reality, the reduction in overprovisioning requirements and related agility and performance benefits offered by AWS mean that an on-premises environment would require twice the spend to achieve comparable performance.

**Study participants offered more details on these types of cost-related efficiencies achieved with AWS:**

▶ **Significantly changing utilization rate, VP/CIO, financial services:**

*“With our on-premises environment, we would often utilize 10% or less of our resources because we needed the space for peak times ... Now, with AWS, because we can expand capacity as needed or on demand, we have pretty close to zero overhead.”*

▶ **Leveraging containerization capabilities to optimize costs, VP, IT applications and connectivity, biotechnology:**

*“We have been leveraging containerization with solutions like EKS or ECS from Amazon, which reduce the overall footprint of EC2 instances ... We can scale nonproduction workloads appropriately and eliminate them when not used while appropriately scaling production workloads.”*

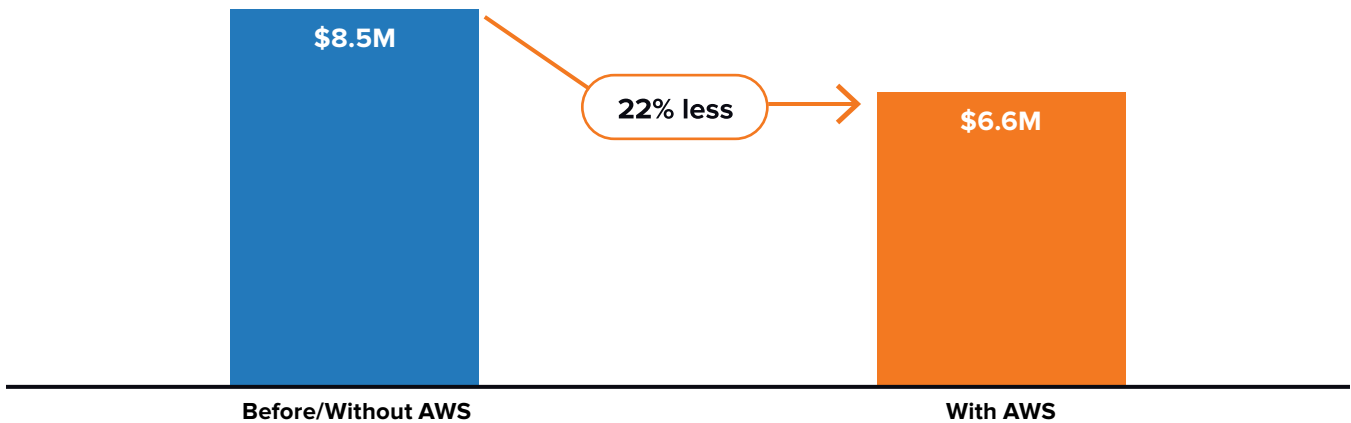
▶ **Cost savings by matching capacity to actual demand, director, IT operations and logistics, transportation:**

*“An ‘aha’ moment we have had during COVID-19 is our ability with AWS to really ebb and flow the cost, whereas with on premises, our investment sits there whether it’s getting utilized or not.”*

**Figure 4** quantifies the annualized infrastructure-related savings that participating organizations are achieving with AWS. On average, IDC calculates that they will save somewhat more than \$1.9 million per year by spending 22% less for running equivalent workloads with AWS.

**FIGURE 4**  
**Annualized Infrastructure Costs**

(\$ per organization per year)



n = 14; Source: IDC in-depth interviews, September 2021

## Enabling IT Teams

The organizations participating in the study reported that the IT infrastructure cost savings, as noted previously, were complemented by significant IT staff efficiency gains. The features, functionality, and direct support provided by AWS enabled IT teams to spend less time on routine day-to-day management and support tasks. Study participants translated these efficiencies into increased focus on IT innovation, business-enabling projects, or supporting IT and business activities more efficiently.

### Interviewed North American AWS customers provided examples of this shift:

- ▶ **Shift focus to adding value rather than maintaining and operations, director, IT operations and logistics, transportation:**

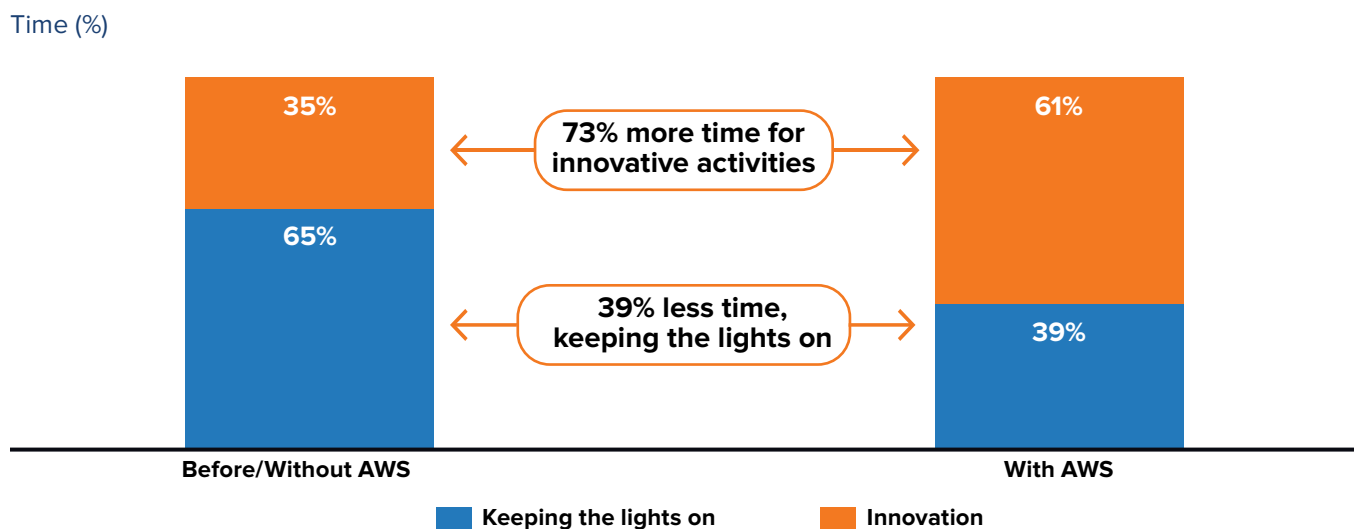
*“With AWS, our IT teams can now focus on areas where we can add value, compared with before, when we were spending all our time just spinning things up and maintaining things.”*

- ▶ **Create space for professional development, global director, BI, healthcare:**

*“Before AWS, we had a larger IT infrastructure team of 40–50 people. Now, with AWS, we have transitioned some of those people into cloud operations and application and database responsibilities.”*

Figure 5 illustrates how the use of AWS has affected how IT infrastructure and administrative teams spend their time on a day-to-day basis. In short, AWS has enabled them to move from spending a clear majority of their time on routine maintenance and operational tasks (65%) to focusing the majority of their time on innovation-related activities (61%). This shift with AWS means that these teams are spending an average of 39% less time on routine chores — “keeping the lights on” — and much more time (73%+) on performing value-generating innovative work.

**FIGURE 5**  
Impact on IT Infrastructure and Administrative Team Activities



n = 14; Source: IDC in-depth interviews, September 2021

The positive impact on the day-to-day efficiency enabled by AWS, as detailed previously, yielded organizational benefits that are quantified in **Table 3**. Most significantly, study participants can manage and run equivalent workloads with substantially less staff resources on the whole — on average 63% less staff time is required for equivalent workloads. When viewed from the perspective of staff time spent on day-to-day activities, the efficiency with AWS is even more significant — average time savings of 78% for study participants.

### They linked these efficiencies to automation in updates and patches and much improved performance that requires less support and intervention:

► **Automated patching and updates deliver significant IT team efficiencies, CIO, media and entertainment:**

*“With AWS, our infrastructure capacity can grow with the same staff. Over the past three years, we would have needed about eight more people without AWS ... The efficiencies have been in patching and updates and have been enormous.”*

► **Efficiencies improve help desk and IT infrastructure teams’ ability to focus on more valuable activities, director, IT operations and logistics, transportation:**

*“With AWS, the infrastructure team doesn’t get bogged down and help desk doesn’t get called on interruptions ... The infrastructure and DevOps teams get freed up because of fewer interruptions and less time searching to find things across different storage stacks.”*

**TABLE 3**  
**Impact on IT Infrastructure and Administration Teams**

	Before/ Without AWS	With AWS	Difference	Benefit
Equivalent FTEs required for same workloads	202.4	74.0	128.4	63%
Staff hours per AWS EC2 virtual instance per year	412.0	151.0	261.0	63%
Value of equivalent FTE time required (\$ per organization per year)	\$20.2M	\$7.4M	\$12.8M	63%
Equivalent FTEs required for "keeping the lights on"	130.4	29.1	101.3	78%
Value of equivalent FTE time required for "keeping the lights on" (\$ per organization per year)	\$13.0M	\$2.9M	\$10.1M	78%

n = 14; Source: IDC in-depth interviews, September 2021

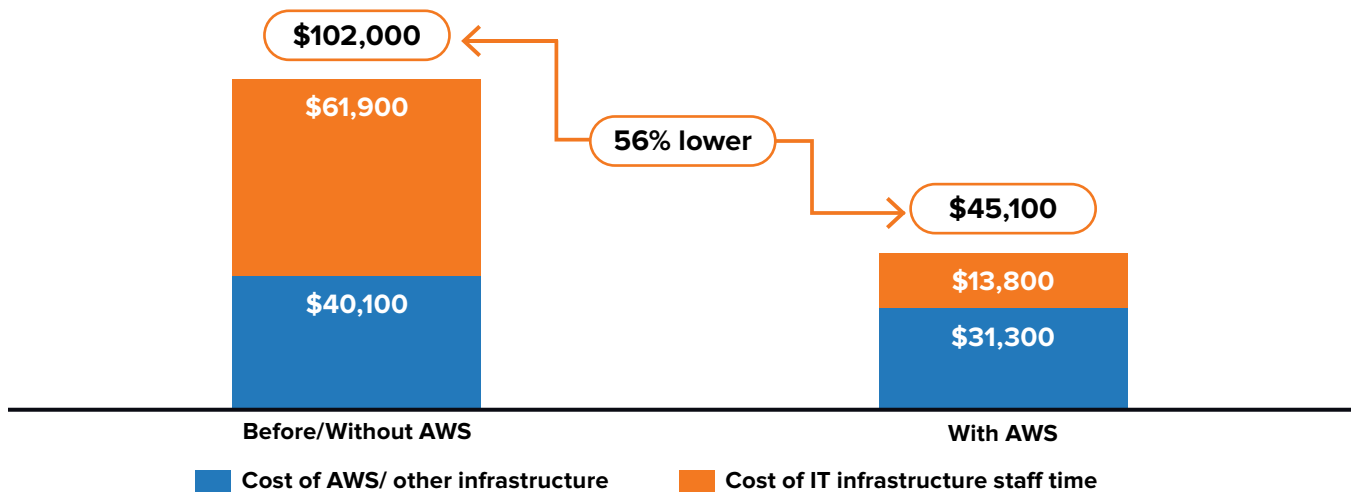


IT infrastructure cost savings and IT team efficiencies achieved with AWS combine to enable study participants to run equivalent workloads at a much lower total cost than with an on-premises environment. As shown in **Figure 6**, IDC calculates that they will incur costs that are an average of 56% lower over five years, a savings of over \$56,000 per EC2 virtual instance over five years.

**FIGURE 6**

## Five-Year Cost of Operations per EC2 Virtual Instance

(\$ per EC2 virtual instance)



n = 14; Source: IDC in-depth interviews, September 2021

## Improving the Capabilities of Development Teams

Study participants have leveraged the use of AWS to distinctly boost their IT agility, scalability, and flexibility. In measurable terms, this means that they can deliver compute/storage resources to their business and development operations with greater speed. Faster and more agile delivery of resources has fostered, expanded, and enhanced development capabilities and makes it more likely that their services, applications, and features meet the needs of their customers and employees.

**Interviewed organizations provided examples of how access to functionality such as self-service capabilities on AWS and the ability to extend and contract their AWS environments in near real time have made their IT operations more agile:**

► **Move to self-service access to IT capacity, VP, IT applications and connectivity, biotechnology:**

*“When we had a request for new resources for a project with our on-premises environment, in the best case we were talking about six weeks, but most often around three months. Now, with AWS, that’s self-service.”*

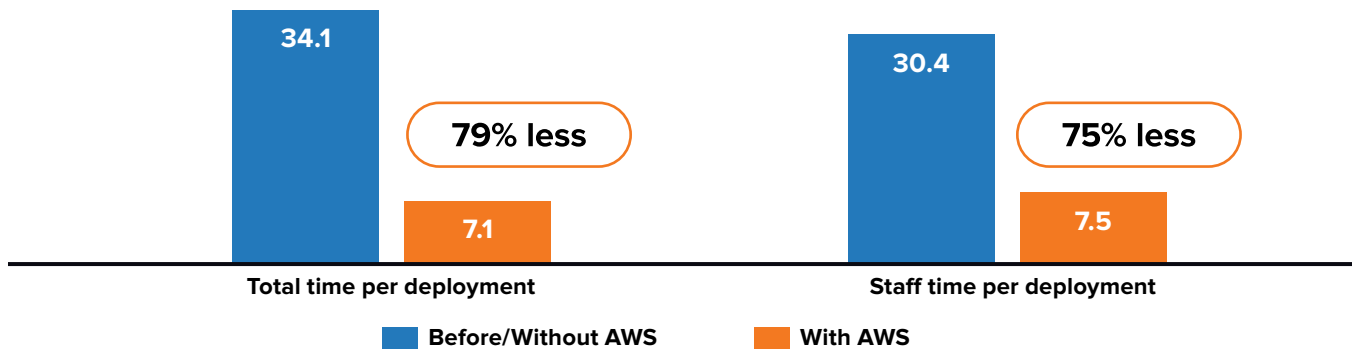
▶ **No longer slowed by capacity limitations, CIO, media and entertainment:**

*“Before moving to AWS, we were hosting virtual machine farms and we were constantly running out of space, hitting 100% faster than we could put resources up.”*

Figure 7 depicts the agility benefits that AWS enables. Average time required to deploy compute/storage resources has dropped from an average of 34.1 hours to just 7.1 hours, a 79% improvement. Correspondingly, staff time required to deploy the same resources has gone down from 30.4 hours to 7.5 hours on average per deployment, a 75% improvement, which dramatically enhances operational agility and translates into faster delivery cadences.

**FIGURE 7**  
**Impact on IT Agility**

(Number of hours per deployment)



n = 14; Source: IDC in-depth interviews, September 2021

**Enhancements in agility directly translate to faster delivery cadences for new software for study participants, including more frequent upgrades to functionality and features. Study participants spoke in more detail to development-related benefits with AWS:**

▶ **Much faster to deliver modernized applications to business, VP/CIO, financial services:**

*“When we’ve modernized applications with AWS, we’ve done so a lot faster by building them as AWS cloud-native applications. A good example is that we’re typically getting a 1.0 product out on AWS within three months, and this typically would have taken at least six to nine months on premises.”*

▶ **Automation and moving to infrastructure as code, director, IT operations and logistics, transportation:**

*“With AWS, we can build our entire infrastructure as code. We can hand a developer the script and say, ‘Here’s our standard QA script. Take this and build it in your sandbox. When you’re done, here’s the kill switch just to kill it all off.’”*

Table 4 (next page), provides metrics that quantify the AWS-enabled improvements in the organizations’ development processes. The average number of new applications and number of new features released per year both more than doubled (127% and 143% higher, respectively) with AWS. Correspondingly, the development life-cycle times for new applications and features were shortened by 49% and 40%, respectively.

**TABLE 4**  
**Impact on Development KPIs**

	Before/ Without AWS	With AWS	Difference	Benefit
<b>New applications</b>				
Number of new applications per year	19.1	43.3	24.2	127%
Development life cycle in weeks — new applications	21.3	10.8	10.5	49%
<b>New features</b>				
Number of new features per year	96.9	235.8	138.9	143%
Development life cycle in weeks — new features	6.0	3.6	2.4	40%

n = 14; Source: IDC in-depth interviews, September 2021

**Table 5** provides additional insights into development-related benefits enabled by AWS. Study participants reported more than doubling the number of releases (138%) and having the ability to carry out changes and updates to software products much more expeditiously, requiring an average of 48% less time on average. They increase the cadence of their release cycles with AWS even as they improve the quality of releases, as measured by incurring 28% fewer release errors and handling errors 41% faster on average. These metrics represent a potent combination of speed, quality, and efficiency when it comes to supporting their business activities with new software functionality.

**TABLE 5**  
**Impact on Release KPIs**

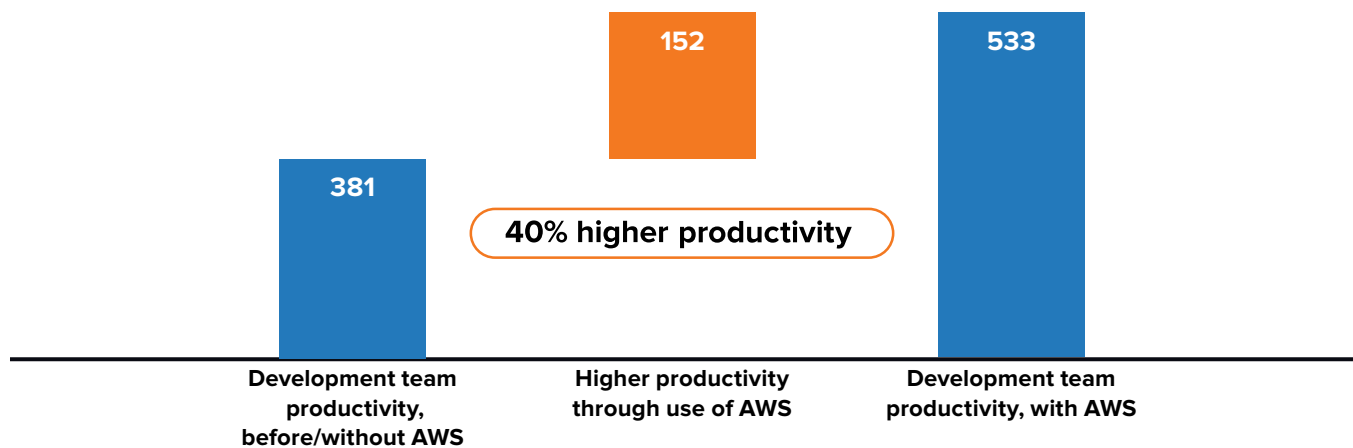
	Before/ Without AWS	With AWS	Difference	Benefit
<b>Number of releases per year</b>	516.0	1,225.0	709.0	138%
<b>Releases with errors/defects</b>	16%	11%	4%	28%
<b>Staff time in hours to address per error/defect</b>	22.6	13.2	9.4	41%
<b>Time required in days to make changes/updates to applications</b>	7.0	3.6	3.3	48%

n = 14; Source: IDC in-depth interviews, September 2021

**Tables 4 and 5** show how study participants have leveraged AWS to provide customers and employees with applications of higher overall quality and timeliness, key to optimizing their business operations. For interviewed organizations, this means that their development teams are more effective and productive and ultimately more valuable. As shown in **Figure 8**, study participants reported higher average development productivity gains of 40%, reflecting the increased organizational value. A global director, BI, at an interviewed healthcare customer spoke to the value of their development team using AWS: “We’re benefiting from the speed and velocity of AWS and getting our products to market faster. Our ability to do that goes up significantly as we give developers more of a free rein and allow them to control what they can do and how quickly they can initiate a test instance.” The use of AWS means that development teams that average 381 developers working on AWS platforms now have the equivalent productivity of 533 developers, a marked and differentiating value for study participants (see **Figure 8**).

## FIGURE 8 Development Team Productivity Gains

(Equivalent productivity — FTEs per organization)



n = 14; Source: IDC in-depth interviews, September 2021

## Minimizing Operational Risk and Related Costs

Organizations participating in the study are benefiting from enhanced application quality, performance, and delivery cycles with AWS, as reported previously, and just as importantly, they are also realizing substantial improvements in reliability and uninterrupted access to applications and services with AWS. A number of interviewed organizations reported experiencing significant ongoing challenges with their on-premises environments as aging infrastructures and management inefficiencies resulted in too frequent business-impacting outages.

## Study participants described how their use of AWS has resulted in improved reliability and lower operational risk for their mission-critical applications:

### ▶ Improved permissions and fewer security breaches, CIO, media and entertainment:

*“We have 95% fewer security events with AWS. It’s a hard question to answer because basically it is not so much breaches, but we had a lot of unwanted access to resources or servers that had largely disappeared with AWS. Permissions has improved greatly.”*

### ▶ Improved reliability and better access to important business-generating tool, IT director, manufacturing:

*“We have better reliability for our website with AWS, and more importantly, the custom pricing tool is more available to our internal people. We can be more responsive, which results in better customer satisfaction.”*

As depicted in **Table 6**, study participants have most importantly reduced the frequency of unplanned outages by an average of 84% with AWS while requiring 61% less time on average to resolve such outages. This means that the outages that do occur exert a far lower cost on employee productivity and business activities: IDC calculates that they have reduced lost productive time by an average of 83% and lost revenue by an average of 82%. Not only do these figures represent significant financial value for study participants, almost \$6 million per year of increased productivity and \$17 million per year in revenue losses avoided, but they mean that study participants provide a much-improved customer experience and face far lower operational risk.

**TABLE 6**  
**Impact on Unplanned Downtime KPIs**

	Before/ Without AWS	With AWS	Difference	Benefit
<b>Number of unplanned outages per year</b>	56.4	9.2	47.3	84%
<b>Mean time to repair (hours)</b>	4.0	1.5	2.5	61%
<b>Hours of productive time lost per user per year</b>	10.0	1.7	8.3	83%
<b>Productivity loss per year in FTEs per organization</b>	100.5	17.2	83.3	83%
<b>Value of lost productivity time per organization per year</b>	\$7.0M	\$1.2M	\$5.8M	83%
<b>Value of lost revenue per year per organization</b>	\$20.7M	\$3.8M	\$17.0M	82%

n = 14; Source: IDC in-depth interviews, September 2021

## Realizing Better Business Results

Many of the benefits reported by the interviewed organizations illustrate AWS-enabled business gains through upgraded performance, enhanced agility and scalability, and an improved experience for both internal users and customers. Looking at a consolidated view of impacts demonstrates the improvement in bottom lines for study participants, as they win new customers more effectively and retain existing customers by serving them better and establishing competitive differentiation through functionality, timeliness, and quality of their products and services with AWS.

The AWS-enabled ability to more easily adopt and incorporate new technologies into business models and processes contributed to the reported increases in revenue. In today's world, the ability to leverage the benefits of new technologies by seamlessly and rapidly integrating them into business processes, both internal and customer facing, is key to organizations' ability to effectively compete for market share. Further, while IDC classified development team productivity gains as IT staff benefits for this study, enhanced development capabilities often lead directly to improved ability to address and win business opportunities.

### Organizations reported specific examples of their experiences in using AWS for more quickly and smoothly incorporating new technologies such as AI, ML, and data analytics:

▶ **Improved performance through GPU access and AI/ML technology use, director of engineering, financial services:**

*"With AWS, we can leverage GPUs for machine learning and AI workloads, which is something we couldn't do previously. Having GPUs helps with AI and ML processing by making it faster compared with using CPUs or VMs."*

▶ **Added functionality to applications/services through AWS capabilities, VP/CIO, financial services:**

*"We benefit from the scaling and faster time to market with AWS, and we can use their machine learning engine to add machine learning capabilities to our applications."*

▶ **Much faster application of data in support of business, global director, BI, healthcare:**

*"Previously, we could analyze our data and return the results back to our customers in around 60 days. Now with AWS, we can return those results in about four days — a 15x improvement in turnaround time."*

Organizations shared numerous examples of direct business benefits that they derive from the use of AWS.

### These benefits related directly to improved scalability, flexibility, and performance that they have achieved with the AWS platform, which changes how they serve customers:

▶ **Much faster delivery of important service/solution to market, IT manager, medical device manufacturer:**

*"We launched a COVID-19 testing solution that would normally have taken 18 months, but through use of AWS and the system, we were able to launch in something like 6 months."*



► **Foundation for digitizing services, delivering to meet customer expectations, VP, IT applications and connectivity, biotechnology:**

*“A big initiative for us is digitizing our service offering. With AWS, we can now build things like predictive analytics for our customers to help optimize use of our equipment and instruments.”*

► **Performance and reliability needed for seasonal business demand, IT director, manufacturing:**

*“Before AWS, seasonality in demand was a challenge — we need all of our systems to operate flawlessly and if an outage would basically go all the way to the president and board. We have been able to eliminate these types of outages with AWS.”*

As shown in **Table 7**, business enablement through AWS has resulted in an average revenue increase of \$96.0 million per year per organization, which equals \$103,800 per EC2 virtual instance. For purposes of IDC’s financial model, a 15% margin assumption was assumed, which results in net revenue gains worth an average of \$14.4 million per organization (\$15,600 per EC2 virtual instance). For study participants operating in competitive and fluid markets, the use of AWS has proven to be a competitive advantage with a clear business impact.

**TABLE 7**

## Business Productivity Benefits — Higher Revenue

	Per Organization	Per EC2 Virtual Instance
<b>Revenue impact</b>		
Total additional revenue per year	\$96.0M	\$103,800
Assumed operating margin	15%	15%
Total additional net revenue per year*	\$14.4M	\$15,600

n = 14; Source: IDC in-depth interviews, September 2021

\*IDC applies a 15% margin assumption to calculate net revenue gains for purposes of its financial model.

## ROI Summary

IDC’s analysis of the financial benefits and costs related to the use of Amazon Web Services by interviewed North American organizations is presented in **Table 8** (next page). IDC calculates that, on a per-organization basis, interviewed organizations will achieve total discounted five-year benefits of \$170.0 million, or \$184,000 per AWS EC2 virtual instance, based on enhanced business benefits, improved IT staff efficiencies, faster and more efficient software development, reductions in unplanned downtime, and optimized IT infrastructure-related costs. These benefits compare with projected total discounted investment costs over five years of \$27.8 million per organization (\$30,100 per AWS EC2 virtual instance). At these levels of benefits and investment costs, IDC calculates that organizations will achieve a five-year ROI of 512% and breakeven on their investment in AWS in 10 months.

**TABLE 8**  
**Five-Year ROI Analysis**

	Average per Organization	Average per EC2 Virtual Instance
<b>Benefit (discounted)</b>	\$170.0M	\$184,000
<b>Investment (discounted)</b>	\$27.8M	\$30,100
<b>Net present value (NPV)</b>	\$142.3M	\$153,900
<b>Return on investment (ROI)</b>	512%	512%
<b>Payback period</b>	10 months	10 months
<b>Discount rate</b>	12%	12%

n = 14; Source: IDC in-depth interviews, September 2021

## Challenges/Opportunities

**In pursuing digital innovation and making decisions regarding cloud adoption, IDC sees organizations successfully addressing the following challenges:**

- ▶ Speed of provisioning infrastructure and moving from an IT ticket request type of process to self-service, thereby empowering development teams to move quickly
- ▶ Ability to (and speed of) scaling the infrastructure up and down with containerization and serverless, thereby reducing overhead costs significantly
- ▶ Team size efficiencies for automated patching and updates, enabling the need for fewer people even as infrastructure capacity grows
- ▶ Minimizing costs and staff time related to unplanned outages and security issues, allowing their time to be more productively engaged
- ▶ Enabling innovation with machine learning and artificial intelligence to create competitive differentiation, deliver cost savings, and increase revenue
- ▶ Empowering developers to delivering new applications and functionality to market rapidly (e.g., within three months instead of six or in days/weeks instead of months)
- ▶ Needing flawless operation and getting attention from executives, not because of outages, but for enabling the business

Successfully addressing these challenges represents direct lines of questioning for cloud providers as you align technology and architecture decisions with the overarching digital strategy of your organization.

## Conclusion

Cloud adoption continues at a rapid pace, with IDC forecasting compound annual growth rate of 29% from 2020 to 2025 in the combined IaaS and PaaS markets. Organizations that adopt cloud technologies find that lower-cost, cloud-delivered services combined with agility from open source and cloud-native application development practices lead to competitive advantage because technology innovation and competitiveness are tightly linked. Today's CEO, CIO, and CTO increasingly see portfolios of cloud-delivered services covering analytics, business applications, blockchain, security/identity/compliance, storage, database, development tools, compute, media services, hybrid architecture, Internet of Things, and machine learning as critical for delivering their own differentiated services to customers.

IDC's research demonstrates the strong value for North American organizations of running many of their most important business applications and customer-facing services on AWS. Interviewed AWS customers reported that they have not only made their IT operations more cost effective and efficient but also leveraged new technologies, enhanced scalability, and strong performance to establish and maintain differentiation in highly competitive markets. As a result, they can better serve existing customers and address new business opportunities in a timely and robust manner, which leads to substantial business gains in the form of higher revenue and reduced operational risk. Overall, IDC calculates that interviewed AWS customers from North America will achieve more than a 6:1 ratio of benefits to investment costs over five years, which would result in a ROI of 512%, with breakeven on their investment occurring in an average of 10 months.

## Appendix A:

### Methodology

IDC's standard Business Value/ROI methodology was utilized for this project. This methodology is based on gathering data from organizations currently using Amazon Web Services solutions as the foundation for the model.

**Based on interviews with organizations using AWS, IDC performed a three-step process to calculate the ROI and payback period:**

- 1. Gathered quantitative benefit information during the interviews using a before-and-after assessment of the impact of using Amazon Web Services.** In this study, the benefits included IT infrastructure cost savings, IT staff and development team efficiencies and productivity gains, reduced costs associated with risk, and higher revenue.
- 2. Created a complete investment (five-year total cost analysis) profile based on the interviews.** Investments go beyond the initial and annual costs of using Amazon Web Services and can include additional costs related to migrations, planning, consulting, and staff or user training.
- 3. Calculated the ROI and payback period.** IDC conducted a depreciated cash flow analysis of the benefits and investments for the organizations' use of Amazon Web Services over a five-year period. 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 bases the payback period and ROI calculations on a number of assumptions, which are summarized as follows:

- ▶ Time values are multiplied by burdened salary (salary + 28% for benefits and overhead) to quantify efficiency and manager productivity savings. For purposes of this analysis, based on the geographic locations of the interviewed organizations, IDC has used assumptions of an average fully loaded salary of \$100,000 per year for IT staff members and an average fully loaded salary of \$70,000 per year for non-IT staff members. IDC assumes that employees work 1,880 hours per year (47 weeks x 40 hours).
- ▶ The net present value of the five-year savings 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 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 be inexact due to rounding.*

## Appendix B

### Additional Quotes

#### Selected additional quotes from interviews with North American organizations using AWS are:

▶ **Elastic capacity and strong security capabilities, CIO, media and entertainment:**

*“We chose AWS to have the elastic capability to grow and shrink resources as needed and to be able to manage that. The other reason is the cost. It is very cost effective for us to use Amazon S3 and Glacier and a lot more reliable. We have access to a lot of tools for managing the environment, especially for security, identification, access control, and security auditing. As a result, if we configure it properly, then we have a very secure environment.”*

▶ **Focusing on scalability and serverless architecture, VP, hospitality:**

*“Scalability was key for us in making the decision to use AWS, and we were moving toward more of a serverless architecture too; in terms of how our services were set up, we definitely wanted an AWS framework to help us out. Serverless is important because it allows better performance of our applications, overall.”*

▶ **Automation that delivers infrastructure efficiencies, VP, IT applications and connectivity, biotechnology:**

*“The benefits of AWS come down to staffing and our ability to automate infrastructure. As we’ve grown our infrastructure footprint, we haven’t had to grow resourcing at the pace of the infrastructure growth because we’ve been able to access tooling with AWS necessary to do that in an automated fashion.”*

▶ **Application performance and reduced risk for distributed locations, director, IT operations and logistics, transportation:**

*“As we grow the business more globally, we already have a significant footprint on the other side of the world, but we can make the applications faster with AWS just by leveraging some replication things we never were able to do before. Resiliency is a huge thing for us, not worrying about failover cluster testing or DR testing.”*

▶ **Scalability and costs that align with performance and use, IT manager, medical device manufacturing:**

*“With AWS, we have basically improved performance, reliability, and enhanced flexibility. For example, initially, during COVID-19, we were able to scale the system and server utilization and pay less. So we have pay for performance with AWS and we can scale up and down.”*

▶ **Bending the cost curve for running, storing, and using data, IT director, manufacturing:**

*“Over the last few years, our digital transformation has been enormous. We could see that the spend, especially with data warehousing and other areas with gargantuan amounts of data, was moving upward just to keep up with the pace every year. That definitely has become more manageable at this point with AWS.”*

▶ **Cost savings by matching actual demand, director, IT operations and logistics, transportation:**

*“Some of the aha moments we have had during COVID-19 with AWS is our ability to really ebb and flow the cost, whereas with on premises, once you make that investment that investment sits there whether it's getting utilized or not ... With AWS, we've saved anywhere from 10% to 20% total cost compared with an on-premises environment.”*

▶ **Achieving same performance/scalability that would be much more expensive, director of engineering, financial services:**

*“It can appear to be more expensive with AWS, but we wouldn't be able to get the agility and performance we need with our previous on-premises environment. It was not enough, and it would not scale just the way that we wanted it to. If we were to do this on premises, I think we would need to spend twice as much as we spend on AWS.”*

▶ **AWS functionality that enables administrator efficiencies, VP, hospitality:**

*“AWS has made our job easier, operationally, and we're more efficient in terms of how we deploy updates, which is reflected in the move from five people down to three people ... AWS provides really strong reporting, good utilization tracking, and good load balancing, which gives us flexibility in terms of administrative capabilities.”*

▶ **Improved performance through GPU access and AI/ML technology use, director of engineering, financial services:**

*“With AWS, we have auto updates to the infrastructure and then we can leverage GPUs for machine learning and AI, which is something we couldn't do previously. Having GPUs helps with the AI and ML processing, so instead of using CPUs or VMs, we can leverage GPU and make our processing faster.”*

▶ **Much faster to address release bugs, director, IT operations and logistics, transportation:**

*“We deploy releases once a week across different applications. If we do introduce bugs during those releases, our average time to resolve that bug before was 72 hours, now the average time to deploy and change and fix that bug is 4 hours.”*

## About the Analysts



### **Lara Greden**

#### **Research Director, Platform as a Service (PaaS), IDC**

Dr. Lara Greden is Research Director for IDC's Platform as a Service (PaaS) practice. Greden's research focuses on platforms for application development on private, public, and hybrid clouds and on edge deployments. She directs research into the competitive markets of cloud platforms and application development and deployment services that are enabling digital transformation, including integration, containers, serverless computing, big data, AI, ML, predictive analytics, IoT, and other emerging technologies.

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### **Matthew Marden**

#### **Research Vice President, Business Value Strategy Practice, IDC**

Matthew is responsible for carrying out custom business value research engagements and consulting projects for clients in a number of technology areas with a focus on determining the return on investment (ROI) of their use of enterprise technologies. Matthew's research often analyzes how organizations are leveraging investment in digital technology solutions and initiatives to create value through efficiencies and business enablement.

[More about Matthew Marden](#)



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