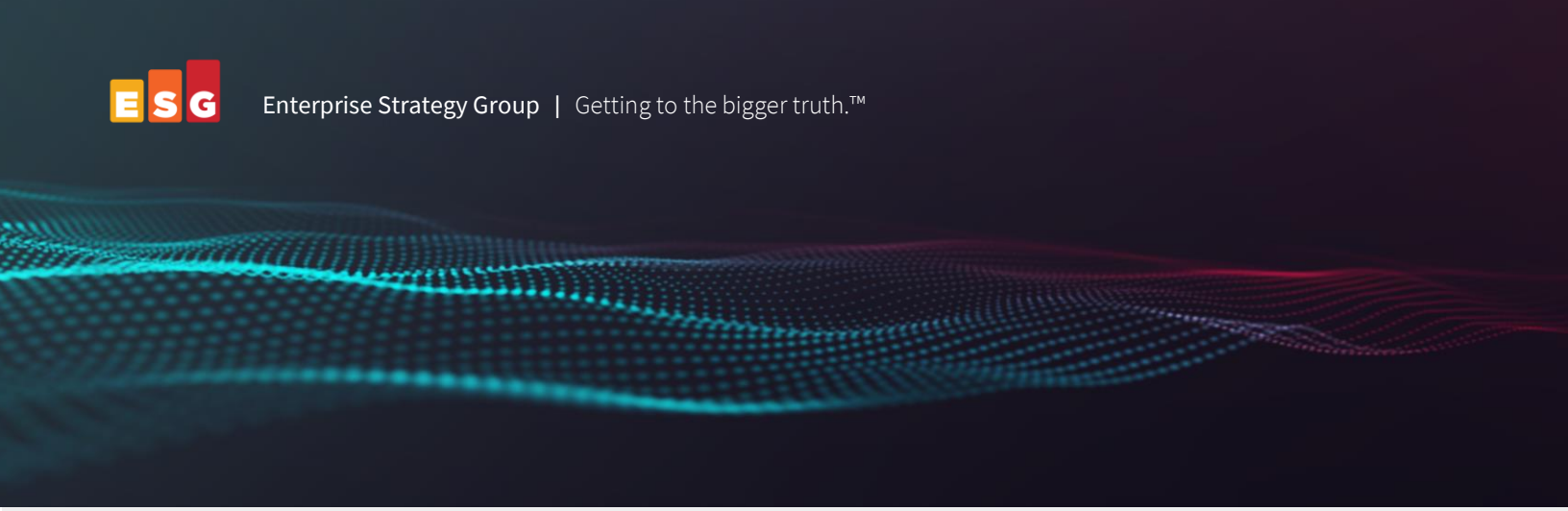

ESG RESEARCH INSIGHTS BRIEF

The Role of Modern Storage in a Multi-cloud Future

Research Exploring the Impact of Modern Storage in Defining Cloud Success

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Executive Summary

The "data decade" is upon us and organizations are aggressively adopting a range of private and public cloud infrastructure solutions to make the most of their digital assets. However, there are clear indications that public cloud infrastructure adoption can have drawbacks if it creates complexity or occurs without careful consideration of the data that is migrated.

A recent ESG survey explored these topics as well as their connection to modern on-premises storage infrastructures, defined, for the purposes of this report, as on-premises storage solutions comparable to or better than public cloud alternatives in areas like cost effectiveness, performance, and scalability. It revealed several compelling outcomes, which will be explored and explained in this paper, including:

- 89% of organizations with modern storage report hybrid cloud initiatives to date have been very effective at driving value for the organization.
- Organizations with modern storage environments completed 57% more of their cloud projects ahead of schedule (relative to those with legacy storage environments).
- Organizations with modern storage environments completed 65% more of their cloud projects under budget (relative to those with legacy storage environments).
- 53% of modern storage environment operators are very confident when achieving hybrid cloud goals versus 23% of those using legacy storage.

Introduction

As business needs have evolved organically, as well as due to world events, the trend towards digitizing products, processes, and workflows has been ever increasing, now more rapidly than ever. At the heart of any digital asset is data, which allows organizations to understand external market forces like customer preferences, market trends, and unmet needs, as well as internal forces like work patterns, inefficiencies, and user experience. For example, the healthcare vertical can be impacted by events that drive urgent demands for high-performance computing or the hybrid cloud flexibility to meet rapidly changing local IT needs to support things like contract tracing and temporary testing locations. Data's criticality is the reason some refer to the next ten years as the "data decade."

Given data's importance, deciding where it will be housed is not trivial. Organizations are increasingly using a combination of private cloud, public cloud, and edge infrastructure to house their data—each of which can have different cost, capability, and security strengths and weaknesses, which must be carefully considered. Further complicating environments is the fact that requirements change over time, the number of potential users can scale up and down dramatically over time, the size and types of data stored may change, remote access needs may evolve, and the performance and availability characteristics of the infrastructure will almost certainly become more stringent as time passes. From an infrastructure design standpoint, the ultimate goal is the delivery of a consistent cloud consumption and management experience, regardless of whether infrastructure runs in a private cloud, public cloud, or at the edge. This allows IT to deliver consistent services to the business while ensuring the best performance for the cost they incurred.

A consistent management experience helps allay challenges related to the "heaviness" of data. Workload mobility across environments has historically been challenging. However, the ability to utilize a consistent management plane and infrastructure management tools across clouds enables workloads and their data to be shifted with minimal effort and disruption.

The delivery of a consistent cloud experience, independent of infrastructure location, helps optimize user experience, with all workloads delivering self-service provisioning, scalability, and elasticity, while at the same time easing the burden of operations on IT teams due to consistent workflows, management tools, and consolidated visibility.

Organizations can reap the benefits of cloud at scale with a "best of both worlds" hybrid cloud approach where workloads are deployed in any cloud or on-premises environment based on the business's requirements, are managed in a uniform way by IT ops teams, and deliver predictable performance and availability characteristics to the user.

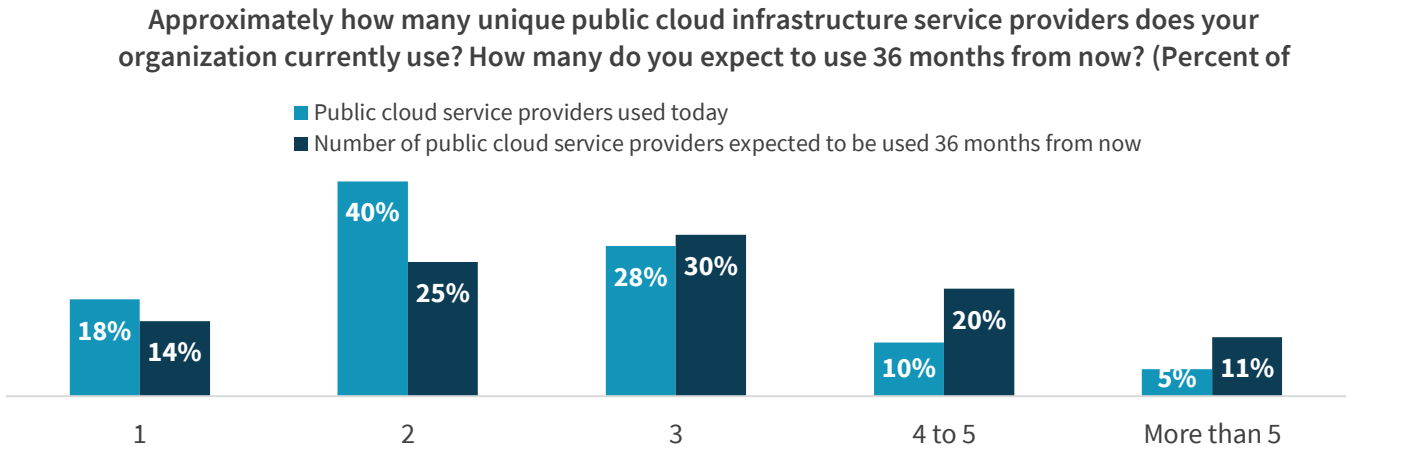
To help validate the value of consistent infrastructure capabilities and a consistent, cloud-agnostic way to manage that infrastructure, ESG conducted research in partnership with Dell Technologies, VMware, and Intel Corporation. The study included a survey of 1,257 IT infrastructure decision makers and line-of-business decision makers in enterprise and midmarket organizations located across North America, Europe, Asia-Pacific, and Latin America.

The data bears out that ease of data and application movement has a direct correlation to driving business success today—part of the reason that Dell Technologies advocates modern, cloud-enabled storage solutions, powered by Intel, that provide fast and secure data management capabilities and simplified manageability regardless of where workloads reside. The data also shows that the delivery of consistent storage capabilities across clouds is linked to an organization's ability to expedite cloud migrations, improve IT efficiency, and build organizational confidence to thrive in a multi-cloud future.

Multi-cloud Environments Are the Norm, but a Lack of Consistency and Control Drives Concern

Many organizations are already well down the path toward operating a multi-cloud IT infrastructure environment. Based on ESG's latest research, 71% of enterprises are using public cloud infrastructure in some capacity today.[1] This survey of cloud infrastructure users shows that the vast majority of these organizations—82%—actually use multiple public cloud infrastructure providers today. The data also shows this trend is likely to persist and accelerate. When asked to project the number of public cloud service providers (CSPs) that will be in use 24 months out, 86% reported two or more, and the percentage reporting four or more had more than doubled (from 15% currently to 31%) (see Figure 1).

Figure 1. Multi-cloud IT Is Pervasive and Increasing



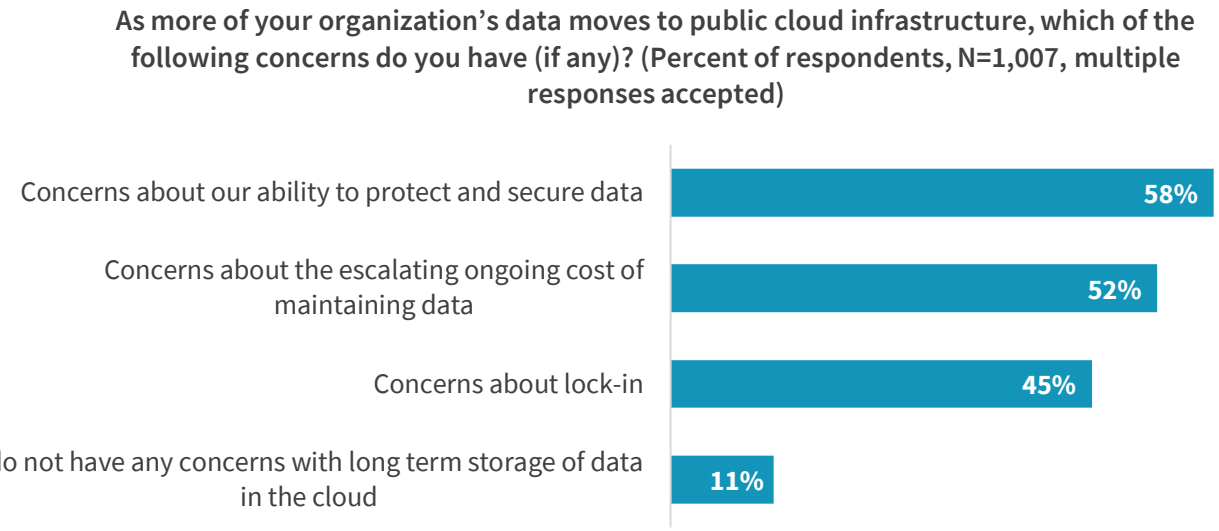
Source: Enterprise Strategy Group

The integration of public cloud infrastructure into an IT environment can offer benefits like faster deployment times and the ability to quickly scale infrastructure based on demand, but these capabilities are not risk-free. Data is a company's

[1] Source: ESG Research Report, *2020 Technology Spending Intentions Survey*, March 2020.

most important asset, and nearly 9 out of 10 respondents at organizations moving more of those assets out of their control have concerns. Specifically, 58% identified concerns over data protection and security, and 52% identified concerns over the ongoing cost of storing data.

Figure 2. Data-related Concerns Emerge with Public Cloud Use



Source: Enterprise Strategy Group

Two potential ways for organizations to remediate these issues present themselves:

1. By directly connecting known, familiar storage solutions to the cloud of choice, organizations can be more confident in storage's security and data protection capabilities. Similarly, with a cloud-connected storage tier, storage is purchased independently from the cloud services it feeds data to, so the organization has more control over ongoing storage costs.

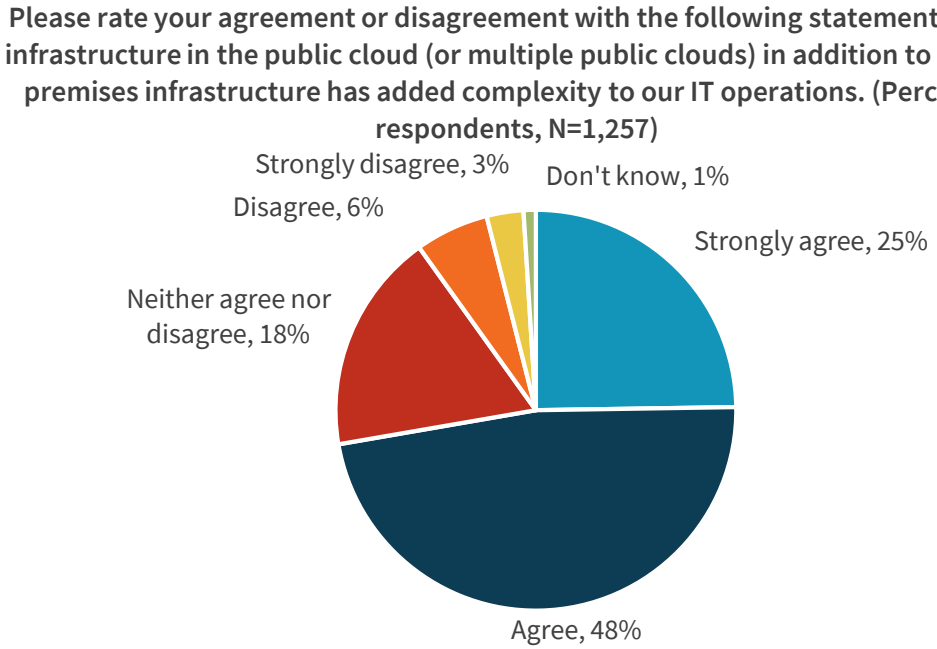
2. More ambitiously, if the organization implements a hybrid cloud management plane that ensures that infrastructure tools, workflows, and visibility are consistent across all clouds in use—private on-premises cloud or any number of public clouds—the organization once again will have more control and peace of mind over security and protection policies. And the improved workload migration capabilities essentially eliminate cloud lock-in.

The Challenges of Cloud Sprawl Mandate Better Storage and Management Strategies

While solutions designed for these situations are available, ESG's data indicates that many organizations have yet to implement them and would benefit from either connecting a true private cloud storage tier to public cloud services or implementing a more consistent approach to multi-cloud infrastructure management.

An effective cloud strategy should drive IT staff efficiency and make their jobs easier, presumably as large portions of infrastructure maintenance are offloaded to CSPs in use. However, the research shows the opposite is often the case, due to cloud sprawl and simply too many platforms for IT staff to manage concurrently, a problem all too real and underscoring the need for better, consistent management across public and on-premises platforms. ESG asked respondents if they agreed or disagreed that adding public cloud(s) to their existing on-premises environment had added complexity to IT operations. A resounding 73% agreed, outnumbering those that disagreed by 8 to 1.

Figure 3. Public Cloud Adoption's Impact on IT Complexity



Source: Enterprise Strategy Group

Another clear indication that cloud strategies and solutions need improvement is the fact that 77% of respondents reported having moved at least one public cloud-resident workload back on premises due to unforeseen challenges or satisfaction issues.

These issues are often driven by public cloud over-exuberance. Public cloud solutions are often seen as a way to drive innovation and agility. In turn, some organizations have pivoted to a cloud-first mindset, meaning they believe everything or almost everything should move to the cloud. This approach can create data-centric challenges from varying and unexpectedly high egress costs, latency issues, and lock-in, to compliance and control issues. Understanding how public cloud architectures will impact data is a critical step, and when skipped, organizations expose themselves to risks.

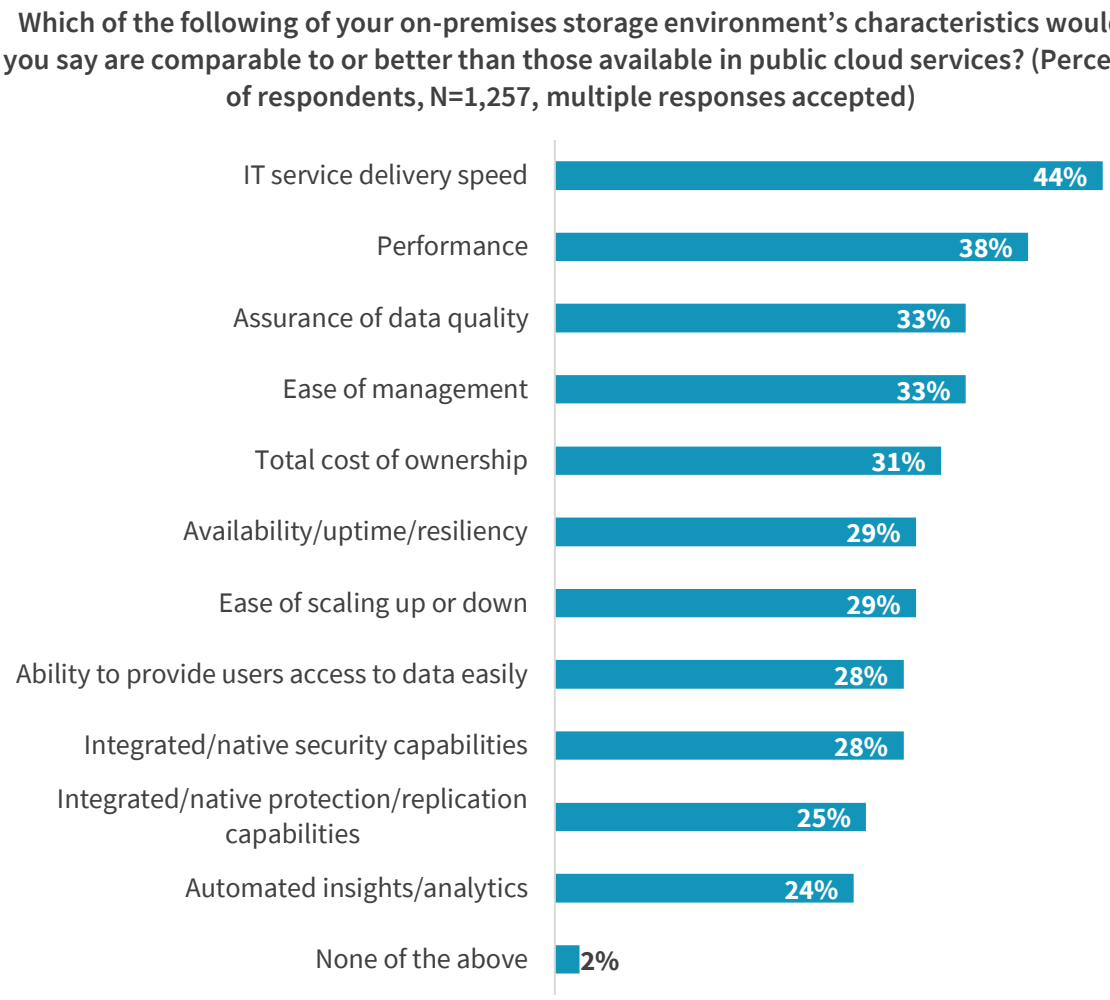
The Connection between Modern Storage and the Cloud

In the previous section of this report, we outlined two storage approaches that enable optimized cloud outcomes. In both cases, on-premises storage must be modern, which, for the purposes of this paper, means offering functionally comparable to or better than public cloud alternatives across a broad set of characteristics. If an organization connects an on-premises storage tier to the public cloud but does so at the expense of using cloud storage that has better capabilities, it will not maximize outcomes. Alternatively, the organization may architect a private cloud and implement a cloud orchestration solution to allow consistent management and free movement of data and workloads across clouds. However, if the private cloud's storage capabilities lag, the organization won't be able to most effectively take advantage of the consistency and flexibility it enabled.

In the survey, respondents were asked to compare their on-premises storage environment to public cloud alternatives in areas such as service delivery speed, performance, assurance of data quality, ease of management, total cost of ownership, availability/resiliency, ease of scaling up or down, ability to provide users access to data easily, integrated native security capabilities, integrated native replication capabilities, and automated insights/analytics (see Figure 4). Based on the number of areas where on-premises environments were considered comparable to or better than the public cloud, we categorize organizations as having a modernized storage environment (comparable or better in 7 or more areas), an

emerging storage environment (comparable or better in 2-6 areas), or a legacy storage environment (comparable or better in 1 area or none). Based on these definitions, 8% of organizations represented have modern storage today, the vast majority's storage capabilities are emerging (78%), and 14% operate a legacy storage environment.

Figure 4. Where On-premises Capabilities Match, or Exceed, Public Cloud Options



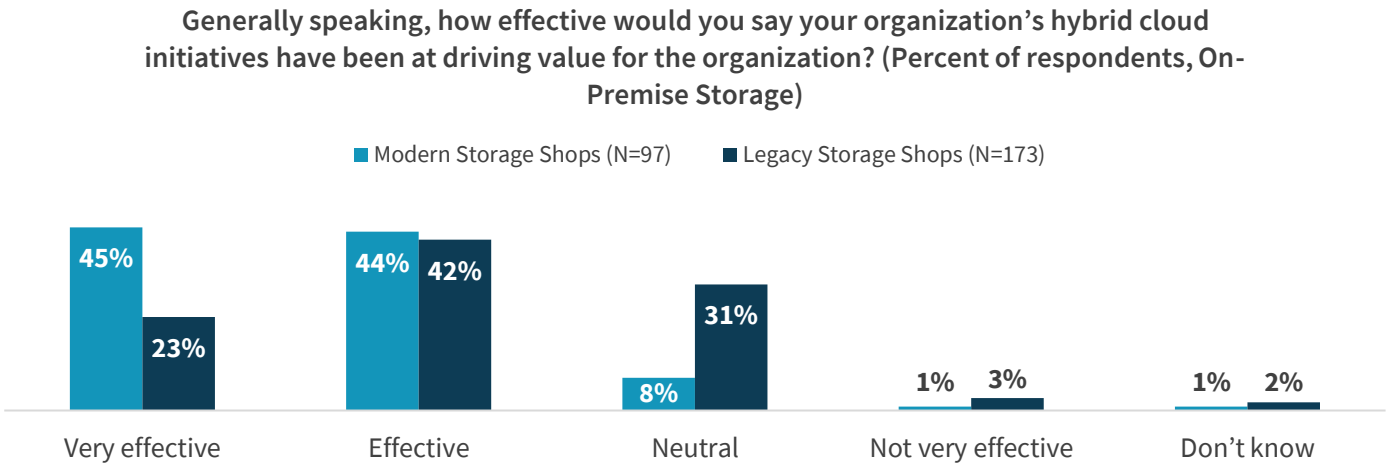
Source: Enterprise Strategy Group

To test whether there is indeed a connection between the state of an organization's storage environment and improving cloud outcomes, we compared performance levels at organizations with modern storage to those with legacy storage across a number of areas. While we cannot infer direct or complete causality, it is our belief that an organization's on-premises storage environment can enhance cloud outcomes.

Qualitatively, there are certainly indications that the presence of an on-premises modern storage environment improves the effectiveness of hybrid cloud initiatives. Nearly 9 out of 10 organizations (89%) with modern storage environments report they are effective at driving value with hybrid cloud initiatives (see Figure 5). Maybe more notable, they are ~2x more likely than those with legacy storage to say hybrid cloud initiatives have been very effective. Of course, "hybrid cloud" is a somewhat subjective term. Some organizations view hybrid cloud as simply running some workloads on-premises and some in the public cloud. Alternatively, some organizations view hybrid cloud as the disaggregation of workload tiers and running the workload's components in different locations. For example, a workload's storage tier may remain on-premises, while the web front-end it is connected to runs on public cloud infrastructure.

Regardless of the definition, it is easy to see how a modern storage environment that is highly scalable, performant, secure, and reliable reinforces capabilities. If achieving a mix of infrastructure locations is the organization's goal, modern on-premises storage can help provide the foundation of a highly capable private cloud to leverage as one of many cloud options. If workload disaggregation is the organization's view of hybrid cloud, access to a robust storage tier that can be connected to various public cloud compute services as desired is definitively an enabler.

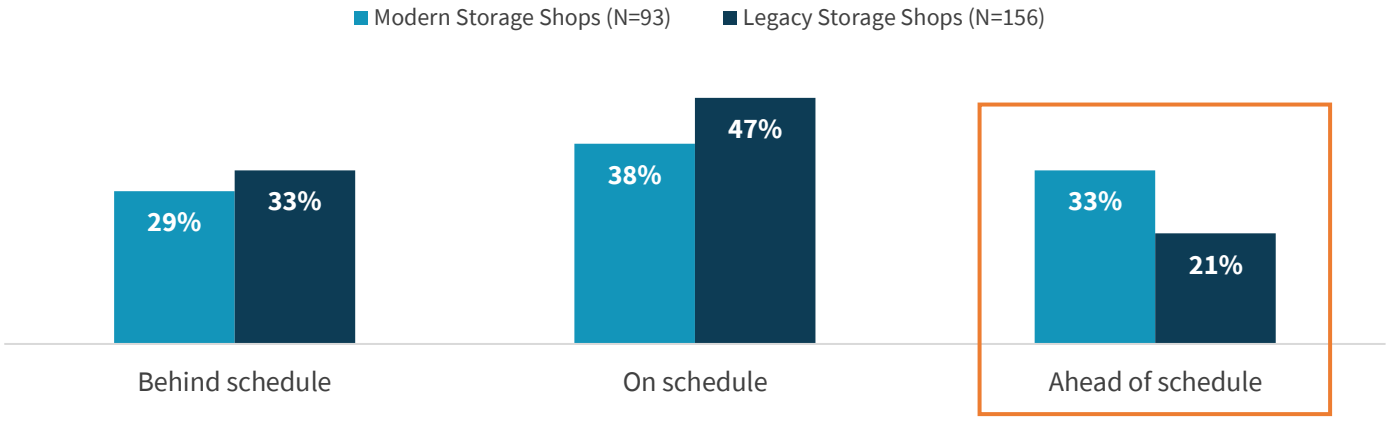
Figure 5. Hybrid Cloud Initiatives Are More Effective with Modern Storage



Source: Enterprise Strategy Group

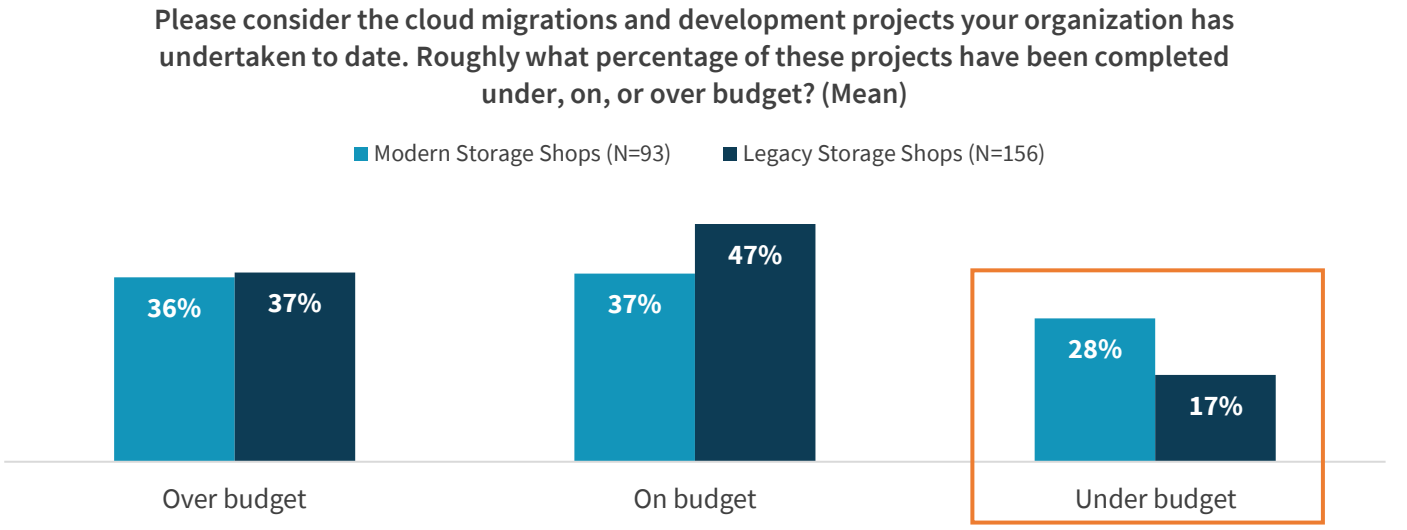
Moving to a more quantitative measure, the research shows leveraging the right on-premises technologies, such as modern storage, makes a difference. ESG asked organizations to consider cloud projects to date and classify them as completed behind schedule, on schedule, or ahead of schedule. Organizations with modern storage reported 57% more of their projects were completed ahead of schedule (33% versus 21% of those with legacy storage) (see Figure 6). In a similar fashion, ESG asked respondents what percentage of cloud projects have been completed over budget, on budget, or under budget. Here, organizations with modern storage reported 65% more of their cloud projects completed under budget (28% versus 17% of those with legacy storage) (see Figure 7).

Figure 6. Cloud Projects Are Completed Ahead of Schedule More Often at Orgs. with Modern Storage



Source: Enterprise Strategy Group

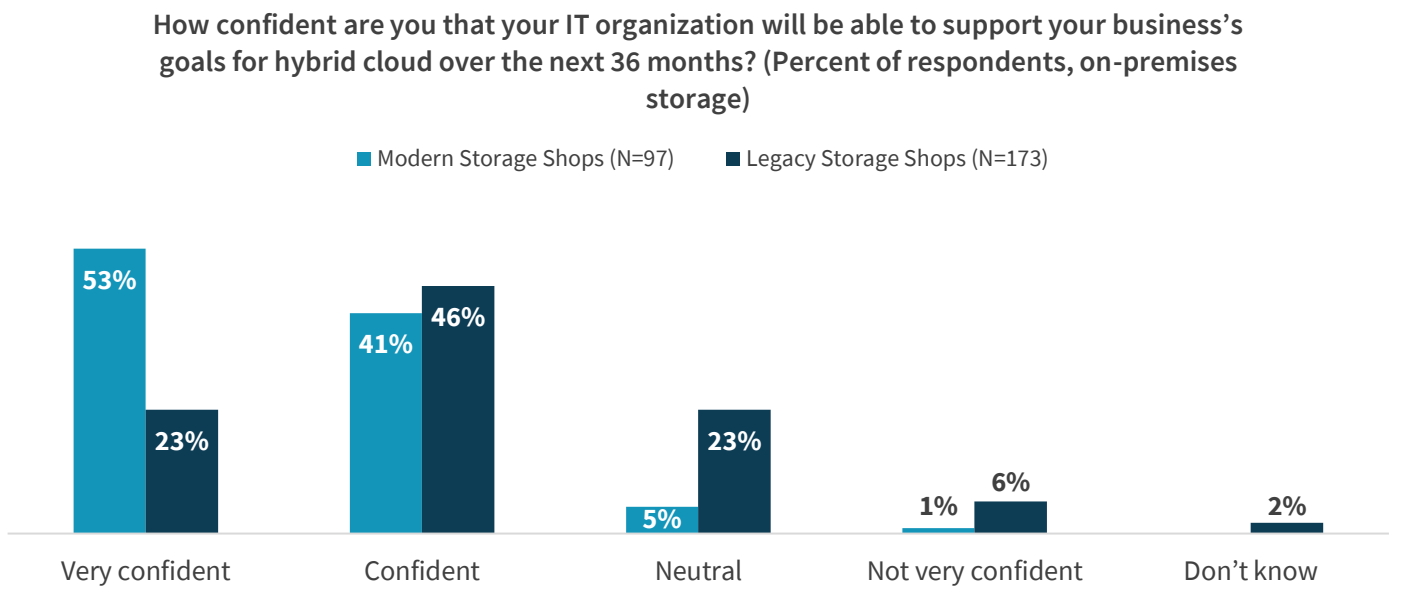
Figure 7. Cloud Projects Are Completed Under Budget More Often at Orgs. with Modern Storage



Source: Enterprise Strategy Group

With these proof points in mind, it is not surprising to note that organizations with modern storage environments are considerably more confident in their IT organizations' ability to support future hybrid cloud goals. Specifically, these organizations were 2.3x more likely to be very confident in IT's capabilities to support the business over the next 36 months (53% versus 23% of organizations with legacy storage environments) (see Figure 8). With hybrid cloud enablement and workload flexibility being among the most impactful and important IT priorities for organizations over the next few years, it is clear that implementing modern storage solutions must also be top of mind.

Figure 8. Modern Storage Fuels Confidence in Achieving Hybrid Cloud Goals



Source: Enterprise Strategy Group

The Bigger Truth

The "data decade" is upon us and organizations are aggressively adopting a range of private and public cloud infrastructure solutions to make the most of their digital assets. One truism: using modern storage helps. Whether serving as the private cloud foundation in a more nascent approach to hybrid and multi-cloud initiatives or as a more aspirational multi-cloud-enabled storage tier that is CSP-agnostic, the connection between modern storage and cloud success is firmly established by the research findings:

- IT organizations with modern storage environments complete 65% more of their cloud projects under budget (compared to the percentage completed under budget at organizations without modern storage).
- IT organizations with modern storage environments complete 57% more of their cloud projects ahead of schedule (compared to the percentage completed ahead of schedule at organizations without modern storage).
- 89% of IT organizations with modern storage environments report they are effective at driving value with hybrid cloud initiatives.
- IT organizations with modern storage environments are 2.3x more likely than those without to be very confident in their abilities to support future hybrid cloud goals.
- Organizations with modern storage environments are 46% more likely to be viewed by their IT teams as competitive differentiators.

How Dell Technologies Can Help

Regardless of where organizations are on their cloud enablement journey, Dell Technologies can help.

For those eager to adopt public cloud computing services but wanting to retain control over their data in an on-premises environment, Dell EMC Cloud Storage Services deliver scalable, resilient cloud-attached storage ideal for securely moving or deploying demanding applications in the cloud for disaster recovery, analytics, test/dev, or to support specific use cases for unstructured data in select vertical markets.

For those more interested in implementing a broader consistent multi-cloud operations model, Dell Technologies Cloud is a set of cloud infrastructure solutions designed to do just that across private clouds, public clouds, and edge locations, reducing the barriers of cloud adoption and letting application and business requirements determine where workloads reside.

Appendix – Research Methodology and Respondent Demographics

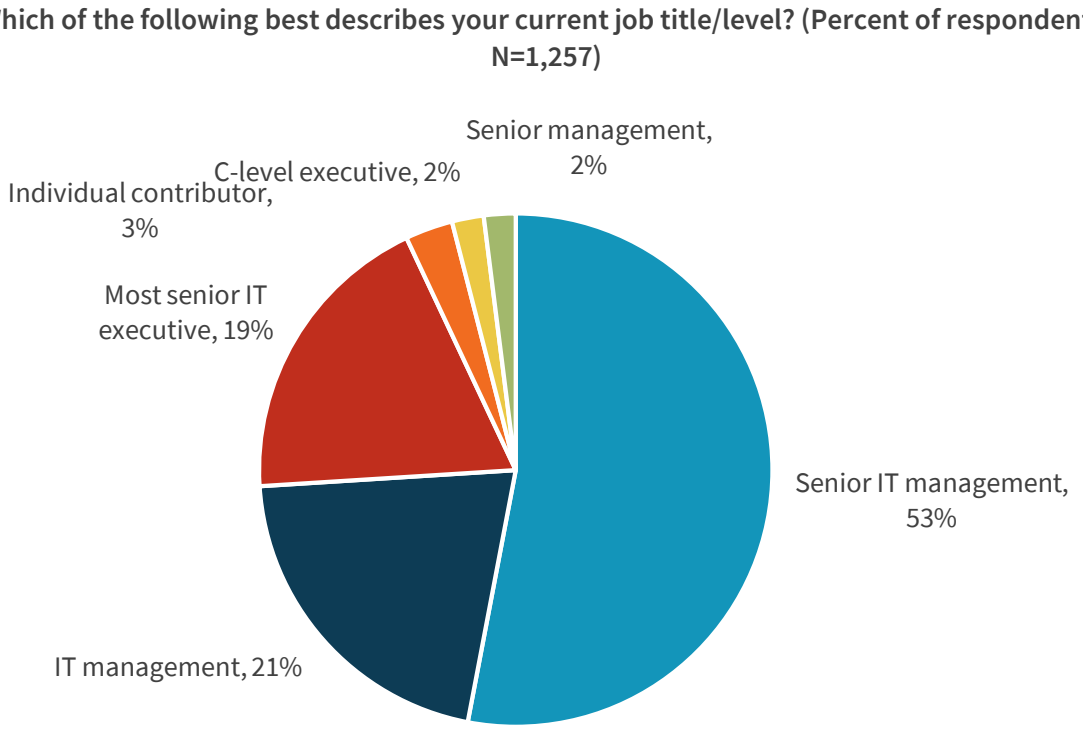
To gather data for this report, ESG conducted a comprehensive online survey of IT decision makers from private- and public-sector organizations in 11 countries: US (33%), Canada (4%), UK (13%), France (9%), Germany (7%), Singapore (5%), Australia (5%), India (4%), Hong Kong (3%), Brazil (8%), and Mexico (8%). The survey was fielded between September 17, 2019 and October 12, 2019. To qualify for this survey, respondents were required to have influence in the purchase of cloud investments (public or private) at organizations utilizing public cloud infrastructure and operating modernized on-premises data center environments.

After filtering out unqualified respondents, removing duplicate responses, and screening the remaining completed responses (on several criteria) for data integrity, a final sample of 1,257 respondents remained.

All respondents were provided an incentive to complete the survey in the form of cash awards and/or cash equivalents. Note: Totals in figures and tables throughout this report may not add up to 100% due to rounding.

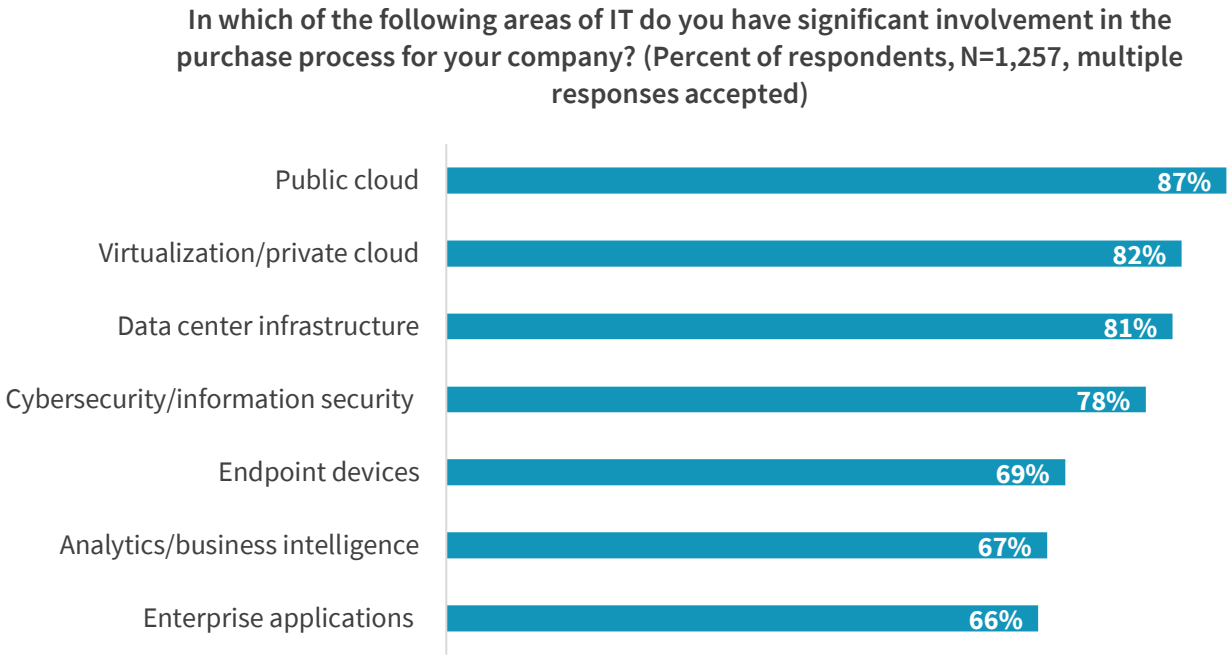
The figures below detail the demographics of the respondent base: individual respondents' current job responsibilities, as well as respondent organizations' total number of employees and primary industry.

Figure 9. Survey Respondents, by Job Title/Level



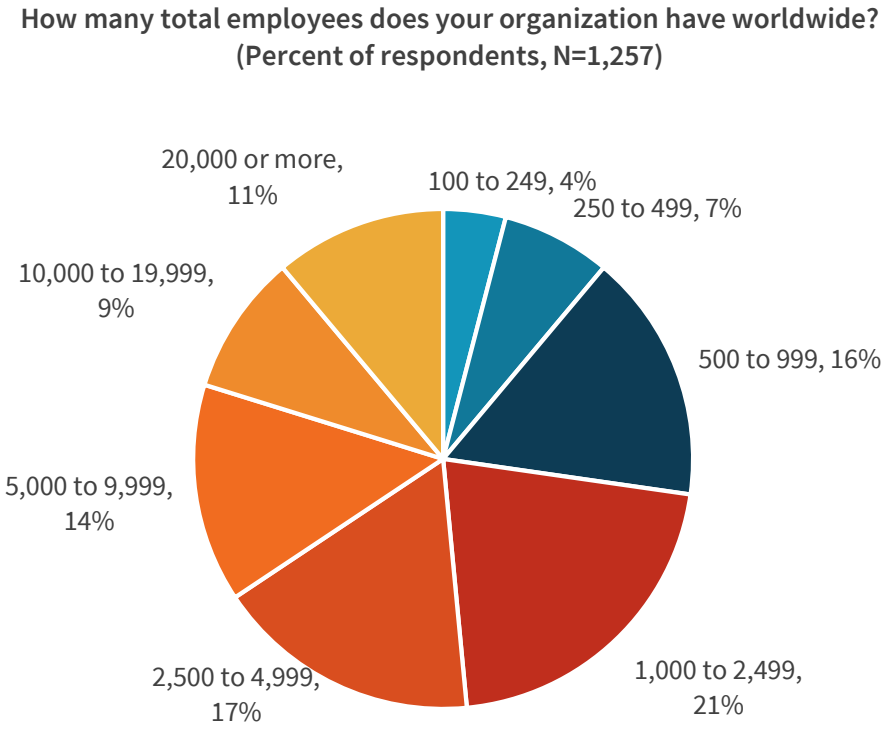
Source: Enterprise Strategy Group

Figure 10. Survey Respondents, by IT Responsibility Areas



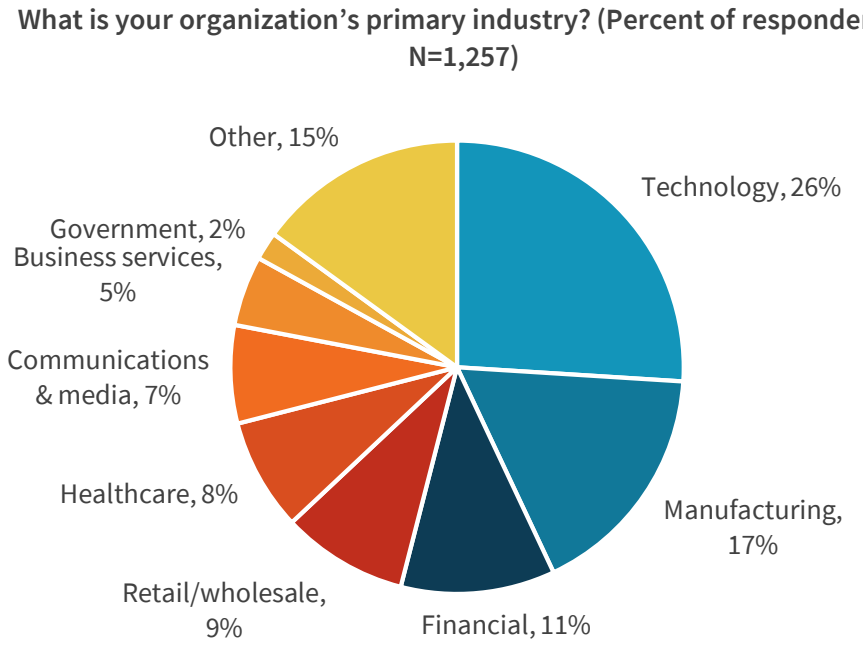
Source: Enterprise Strategy Group

Figure 11. Survey Respondents, by Company Size (Number of Employees)



Source: Enterprise Strategy Group

Figure 12. Survey Respondents, by Industry



Source: Enterprise Strategy Group

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