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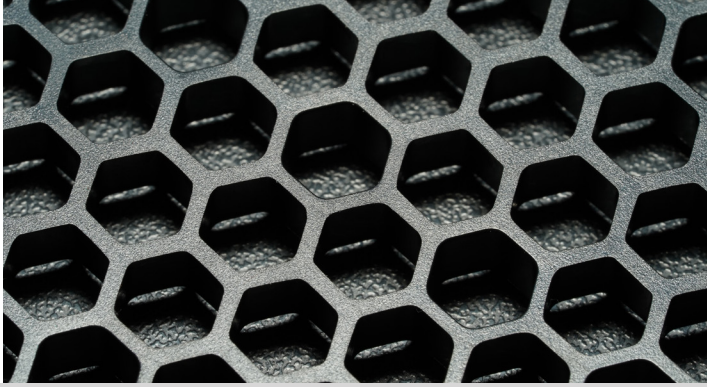


Pure Storage Foreword

A sensible cloud storage strategy is foundational to any hybrid IT architecture, since these storage resources will be required to provide resiliency, accessibility, performance, and protection for the data fueling applications in the cloud. In a recent 451 Research survey, 12% of respondents say they are moving workloads across the hybrid IT environment frequently. An additional 17% say they are moving workloads monthly, while 49% confirm they move their data only once or twice per year. Collectively, 78% of those surveyed move data more than once a year. The frequency is significant when you consider the amount of time and resources needed to migrate the data. This time and resource is traditionally handled by in house staff, which takes them away from higher level, business value projects. On the topic of data migrations, customers frequently ask "what about moving data back on premises?" This is not something for which public cloud vendors will have an easy or inexpensive answer. It is just as important to be able to move your data back on-premises as it is to move it to the cloud.

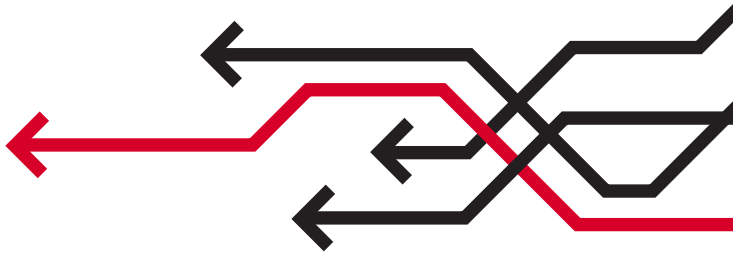
Cloud Egress Charges Stifle the Progress of Cloud

Though hyperscalers generally do not charge customers with fees to import data into their clouds, they often use cloud egress charges to deter customers from exporting or accessing data outside of their cloud infrastructures. This pricing strategy directly influences cloud storage adoption. Thirty-four percent (34%) of organizations claim that these egress charges impact their use of cloud storage, and another 32% of organizations claim that egress charges have slowed down their adoption of cloud storage. Organizations that underestimate the amount of data moving back and forth from cloud to on-premises are occasionally surprised by large bills for egress fees. In some cases, egress charges have resulted in organizations repatriating their data back to their on-premises infrastructure.

The ability to solve for the impact of egress costs is directly tied to storage AND to a rich set of data services. The data services layer has a direct impact on application design, mobility, and to the APIs that developers code. The quality of the storage and data services available can make or break a successful hybrid cloud strategy. Though enterprises would like to move most applications to the cloud, many were written well before the cloud, and were never written with the cloud in mind. This results in potentially slow and expensive application refactoring.

There are significant challenges in establishing an efficient, streamlined hybrid cloud environment due to fundamental differences between on-premises and hyperscale cloud environments. Now that we have reached a tipping point in cloud adoption, additional challenges are being revealed as we peel away the layers of the cloud onion. In this Hybrid Cloud Maturity Model, 451 Research highlights the issues that continue to be important in a hybrid cloud ecosystem.

REPORT EXCERPT



Technology & Business Insight

Thought Leadership

January 2022

Hybrid Cloud Storage Maturity Model 2021

Henry Baltazar, Research Director, Storage

Though cloud storage is already a vital resource for most organizations, there is no 'one size fits all' methodology for maximizing the benefits of a hybrid cloud storage environment. This report presents a hybrid cloud storage model that describes the characteristics of organizations and their use of cloud storage.

To learn more or to request a demo, visit spglobal.com/marketintelligence.

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The following is an excerpt from an independently published 451 Research report, "Hybrid Cloud Storage Maturity Model 2021," released in January 2022.

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Executive Summary

Introduction

The current era of cloud storage continues to progress, and these services have evolved to become an essential element in the infrastructures of organizations, ranging from the smallest startups to the largest corporations and government entities. The cloud storage journeys of organizations are far from homogenous, with some companies choosing an all-cloud strategy, while others at the opposite extreme are hesitant to use cloud storage services as a replacement for their on-premises infrastructures.

Broadly speaking, enterprises using cloud storage technologies and services fall into three categories along a continuum in terms of their approach to cloud storage and data management, with a fourth category presenting a vision for the future. The four categories are:

- **Traditional:** These organizations are focused on their on-premises infrastructure and are either not using public cloud storage today or are evaluating these services in proofs of concept (POCs).
- **Maturing:** Maturing businesses are using cloud storage services for specific use cases, such as long-term backup retention, or to provide persistent storage for applications running in a cloud computing environment. The use cases tend to be siloed with no workload mobility between on-premises and public cloud.
- **Modern:** These organizations are notable for establishing a true hybrid IT strategy, which gives business stakeholders the ability to move or spread out workloads to various execution venues to optimize performance, reduce cost or improve resiliency.
- **Future:** A vision for the future of storage and data management, where integrated automation and optimization allow workloads to run in appropriate execution venues, while taking into account the compliance, performance and cost factors and ensuring that resource consumption matches the changing needs of a workload and dataset. Emerging new offerings, such as cloud-to-ground extending the physical reach of hyperscalers, will also be more prevalent in the future state.

About This Report

This report on the hybrid cloud storage maturity model is largely based on end-user survey findings and interviews from our Voice of the Enterprise (VotE): Storage, Data Management & Disaster Recovery 2021 and Transformation 2021 studies, in addition to VotE: Cloud, Hosting & Managed Services and VotE: Hyperconverged Infrastructure studies. Market sizing estimates are derived from our Cloud Computing as a Service Market Monitor: Cloud Storage report.

Key Findings

- **Hybrid IT leveraging on-premises infrastructure and public cloud storage services is the future of IT operating environments.** Forty-six percent of respondents have already implemented this strategy.
- **The majority of organizations are already using cloud storage services in some form.** Sixty-three percent of organizations are using cloud storage for data protection, and the use of IaaS cloud storage services (object, file and block storage services) continues to rise.
- **Data migration is an ongoing challenge.** More than half of organizations are transferring data on a continuous or daily basis between on-premises and public cloud environments, with in-house staff responsible for most of these operations.
- **Optimization will grow in importance.** Cloud storage already consumes a large portion of cloud computing budgets (46%). Half of respondents are already using tools and services to optimize their use of cloud storage.

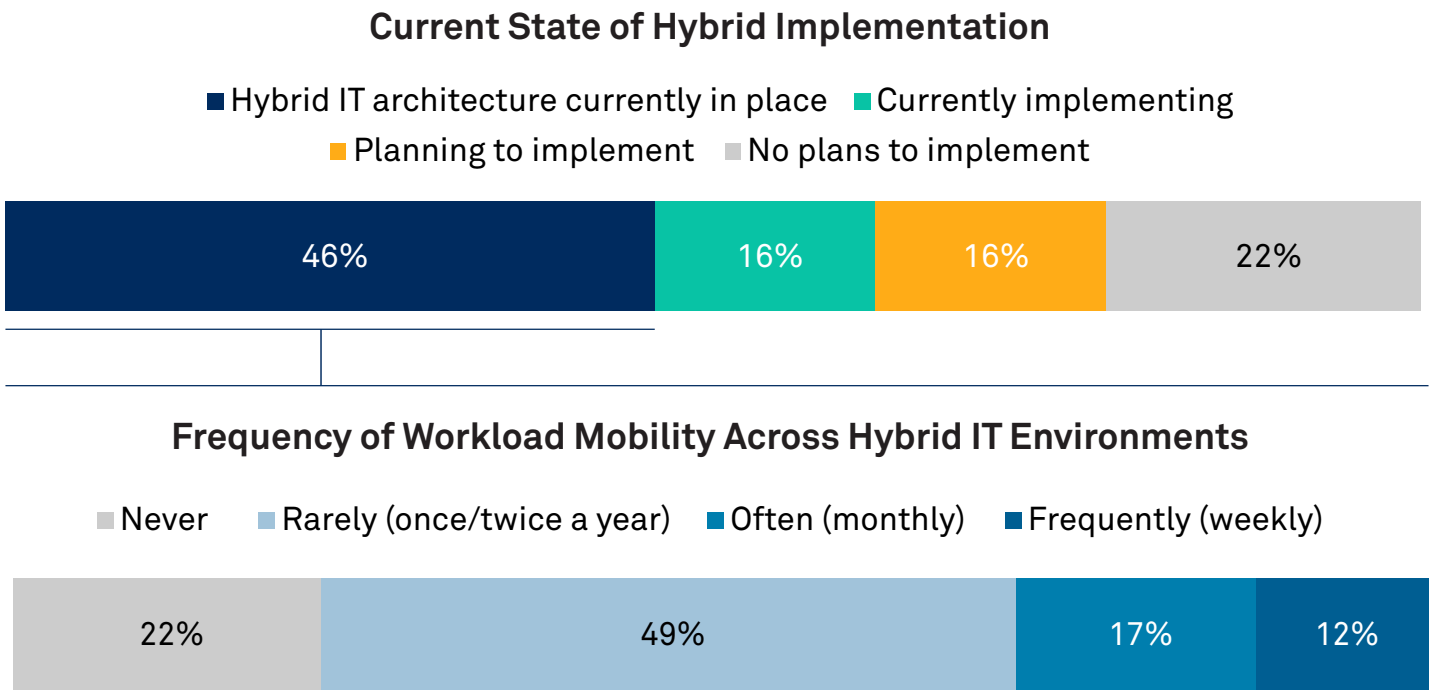
Hybrid IT Implementations Drive Cloud Storage Revenue

Hybrid IT leveraging on-premises infrastructure and public cloud storage services is the future of IT operating environments. In our VotE: Cloud, Hosting & Managed Services, Workloads & Key Projects 2021 study, 46% of respondents say that a hybrid IT environment that leverages both on-premises resources and public cloud in an integrated fashion is currently in place, with 16% currently implementing and an additional 16% planning to implement. Only 22% of respondents have no plans to implement hybrid IT.

A key element in hybrid IT is data and workload mobility, and this is a topic we will discuss in depth throughout this report. Only 12% say they are moving workloads across the hybrid IT environment frequently (weekly), with an additional 17% saying they move workloads on a monthly basis.

A sensible cloud storage strategy is a key element in any hybrid IT architecture, given that these storage resources will be required to provide resiliency, accessibility, performance and protection for the data fueling applications in the cloud.

Figure 1: Current State of Hybrid Implementation and Frequency of Workload Mobility Across Hybrid IT Environments

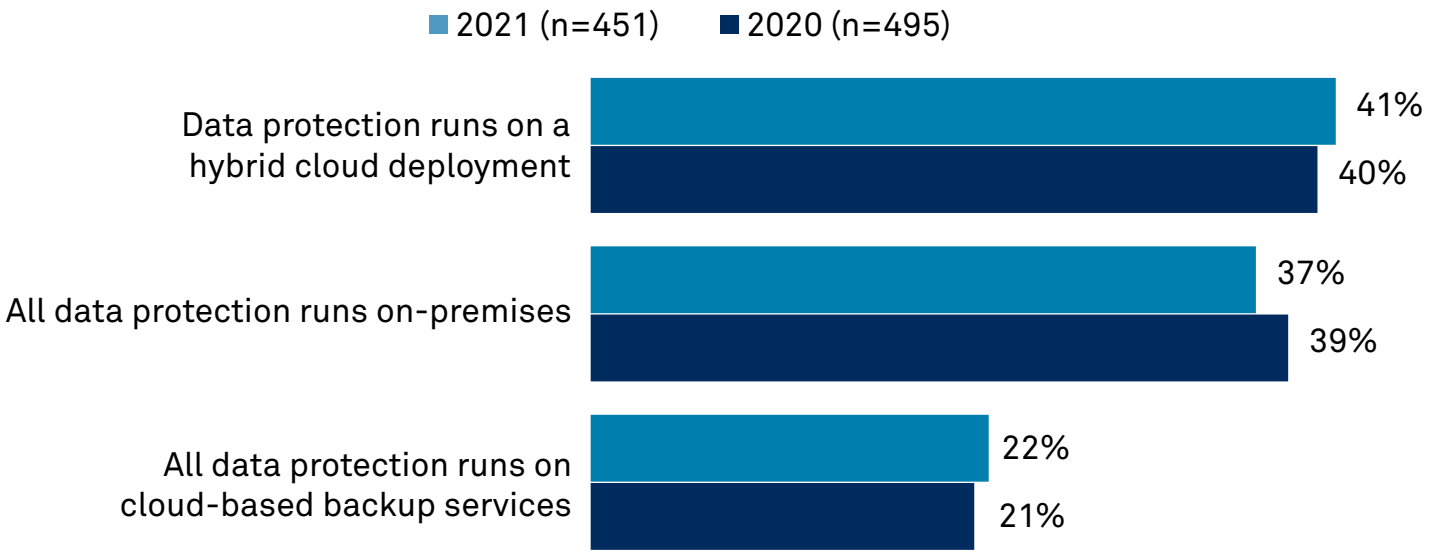


Q. Which of the following best describes the current state of your organization's IT environment? Base: All respondents (n=423)
Q. How often do workloads/applications move between on-premises and off-premises deployment venues in your organization's hybrid IT environment?
Base: Hybrid users (n=230)
Source: 451 Research's Voice of the Enterprise: Cloud, Hosting & Managed Services, Workloads & Key Projects 2021

Backup, Disaster Recovery and Archiving

For many organizations, secondary storage and data protection use cases are the first introductions to cloud storage. In 451 Research's VotE: Storage, Data Management & Disaster Recovery 2021 study, 63% of respondents are already using cloud storage for their data protection needs: 41% are using hybrid cloud deployments with backups run locally on-premises and the cloud for long-term storage, and 22% are running a cloud-based backup service in a SaaS format. Compared with a year ago, respondents who run all of their data protection on-premises decrease slightly from 39% to 37% (see Figure 3). Backup vendors such as Commvault, Veritas, Veeam, Cohesity, Rubrik and many others have been key facilitators for transmitting data from on-premises to cloud, and have been big proponents for hybrid cloud data protection and management.

Figure 4: Most Organizations Are Using Cloud-Based Data Protection



Q. Which of the following best describes your organization's current use of data protection (e.g., backup, disaster recovery)?
Base: All respondents
Source: 451 Research's Voice of the Enterprise: Storage, Data Management & Disaster Recovery 2021

The archiving of unstructured data is a common use case, with 81% of respondents saying they are using public cloud infrastructure for this purpose, up from 74% a year ago. Despite the high percentage of organizations using cloud for archiving, respondents are only archiving 37% of their total data to public cloud storage on average. Additionally, 19% are not archiving to cloud at all. Respondents who see data growth above 25% per year are archiving 43% of their data to cloud, in contrast to respondents with data growth below 25% per year who only archive 33% to cloud.

SaaS-based cloud archiving services today focus on preserving compliance-sensitive data such as emails. As more organizations look to take advantage of low-cost object storage services, we expect to see even larger volumes of data transition from on-premises repositories to cloud storage services.

IaaS Cloud Storage Services: Object, File and Block Storage

Seventy-four percent of respondents in our VotE: Storage, Transformation 2021 study have public cloud storage services in use or in discovery/POC, up from 62% in 2020; only 12% are not considering implementation. Digital transformation leaders have even higher percentages of these services in use or in discovery/POC (82%) compared with learners (73%) and laggards (49%).

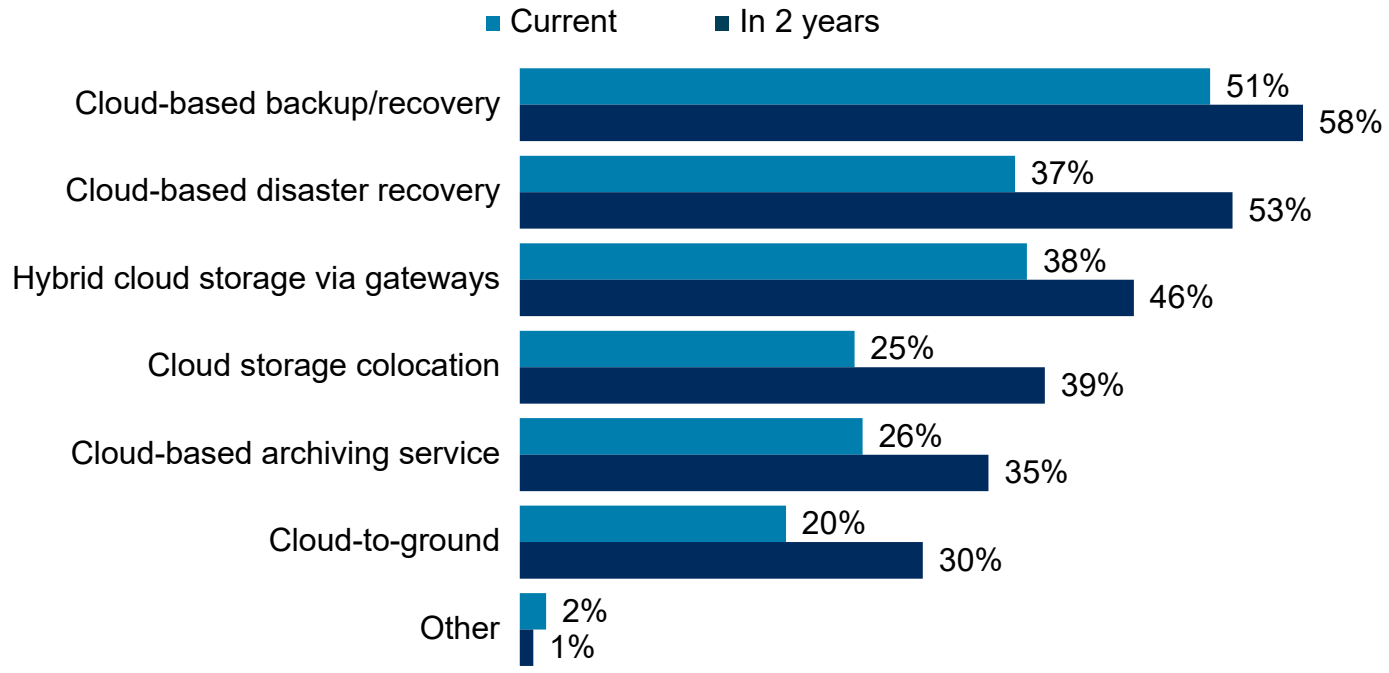
Object storage is the current leader in adoption (see Figure 4), with 55% having it in use today. Cloud archiving services are in use by 46% of respondents today, rising to 50% who plan to have it in use in two years. The projected rise of archive services shows that customers are becoming cost-conscious with their consumption, which is a positive sign of the maturity of the market. Archive services such as AWS S3 Glacier are object storage services, though they have limited performance and take longer to provide data access. We would also note that cloud service providers have been adding integrated tiering capabilities and accelerated data retrieval options to help customers lower their effective storage costs, while making data more rapidly accessible when necessary to fulfill critical tasks, such as recovery from ransomware, or to quickly run an important workload on-demand.

Cloud-based NAS services have grown in popularity over the last few years, with 52% using them today, rising to 59% of respondents who plan on using this service two years from now. We would not be surprised if adoption is higher in the future, given that many significant on-premises storage vendors have recently entered the market with cloud versions of their on-premises NAS. Many existing on-premises applications rely on shared storage using file sharing protocols such as CIFS and NFS, and the cost of rewriting these applications to use object storage protocols is unpalatable for customers.

Cloud-based block storage services such as Google Persistent Disk provide primary storage for applications and serve the same purpose as SAN arrays in on-premises datacenters. Fifty-five percent of respondents are already using cloud-based block storage, rising to 59% of respondents two years from now.

The level of data activity will have a major impact on which services a customer should use, since there is a wide cost disparity between performance-oriented cloud storage offerings and cloud archiving services that are designed for long-term retention of infrequently accessed data. One example is Amazon S3 Standard, which is designed to handle general-purpose storage for frequently accessed data and currently costs customers $23.55 per month to store 1TB of data. At the other extreme, Amazon S3 Glacier Deep Archive can drop those monthly costs to $1.03 for storing 1TB of data. Cloud NAS services, which are substantially more expensive than object storage, have large differentials between their service levels: Amazon Elastic File System (EFS) Standard Storage currently costs $307.20 per month for storing 1TB of active file system data, and in contrast, the Amazon EFS Infrequent Access Storage can drop costs to $25.60 per month for storing 1TB data that is not expected to be accessed often.

Figure 5: Cloud Storage IaaS Services, Today and Two Years From Now



Q. Which of the following public cloud storage services and capabilities does your organization utilize today? Please select all that apply.
Q. Which of the following public cloud storage services and capabilities will your organization utilize in two years? Please select all that apply.
Base: Public cloud storage services are in use or in plan or considering
Source: 451 Research's Voice of the Enterprise: Storage, Transformation 2021

Hybrid Cloud Storage Challenges

A handful of persistent challenges are slowing down organizations on their journey to hybrid IT environments. Feature gaps, network latency and the impact of costs from egress charges and other factors have, in some cases, derailed the cloud ambitions of some organizations.

Data Migration Challenges

Networks continue to be the primary transport for migrations for 45% of respondents, down from 49% a year ago, with physical transports being used by 42% of respondents in their most recent data migration. Provider-enabled transports such as AWS Snowball account for 30% of migrations (up from 18% a year ago), and this figure could grow as larger datasets are moved from on-premises to cloud. This growth could be also driven by the emergence of edge environments – especially those in areas where reliable high-bandwidth WAN connectivity is not available.

Data migration is a challenging task for many organizations, and this will only intensify as data repositories grow in size and as new workloads with challenging requirements for performance and resiliency emerge. While some organizations may think data migration to cloud is an episodic event that happens infrequently, in our VotE: Storage, Data Management & Disaster Recovery 2021 survey, we find that 30% of respondents are migrating data continually (i.e., as data is created or until replication is complete), while an additional 24% are migrating on a daily basis. In comparison, 20% of organizations are moving data on a weekly cadence and only 13% of organizations are moving data on a monthly basis.

Lengthy downtime is not an option for many organizations, with 18% claiming no downtime is acceptable and another 30% saying only downtime on the scale of minutes is acceptable. This clearly shows that migration operations need to be handled quickly and nondisruptively to ensure data is still accessible even during a move.

The majority of migrations are still being done by in-house staff (54%), though we note that a year ago, in-house migrations were more common at 69%. Meanwhile, service provider/system integrator-led migrations rise from 26% of respondents to 41%.

"Some of our larger datasets, the migration to a cloud provider, that took too long over the wire, so … we're considering to move all of our data on the hard drive and have it securely shipped to the cloud provider … Google has some sort of service that they offer, it's securely locked up and whatnot. That's not our preference … but that's something we have to consider as part of our migration."

– IT/engineering manager/staff, 5,000-9,999 employees, $1bn-$2.49bn revenue, financial services

This changing trend was captured in an interview with an IT manager from a financial services organization who started considering using provider-enabled physical transports to handle larger data migrations that could not be completed in a timely fashion over their network transports.

Location and Latency Challenges

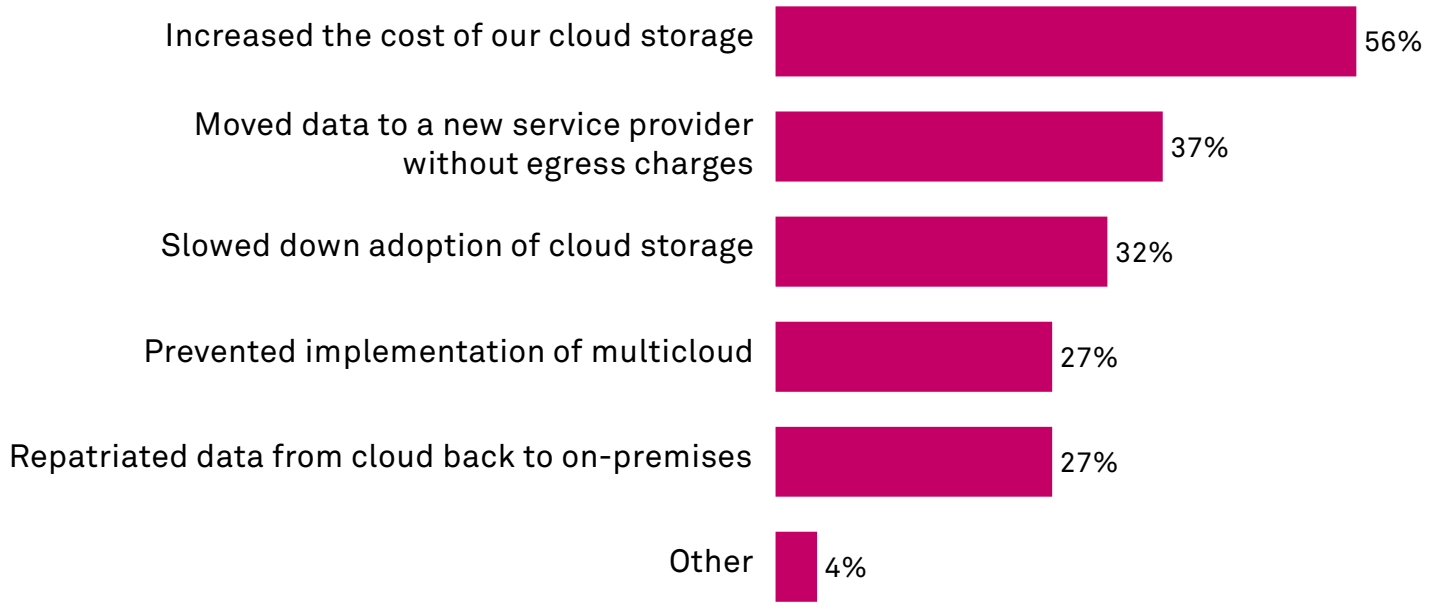
The physical distance between a customer's site and a cloud provider's datacenter can have adverse effects on the performance of applications run at a remote site that have to access data from a distant location. In worse-case scenarios, applications may not be able to function at all and data must be repatriated back to the local site to continue operations.

Organizations often find that the burden of migrating data back and forth between on-premises and cloud creates a need for upgrading the networking bandwidth and traffic-shaping capabilities of their infrastructure. In our VotE: Storage, Data Management & Disaster Recovery 2021 study, 28% of respondents have WAN optimization in use to accelerate data transfer between company-owned datacenters and cloud service providers, with an additional 17% in discovery or POC.

Cloud Egress Charges Stifle the Progress of Cloud

Figure 6: Cloud Egress Charges Discourage Hybrid Cloud in Multiple Ways

34% of organizations have been impacted by cloud storage egress charges



Q. Which negative consequences have occurred? Please select all that apply.
Base: Cloud storage egress charges have affected use of cloud storage (n=75)
Source: 451 Research's Voice of the Enterprise: Storage, Transformation 2021

Though hyperscalers generally do not charge customers with fees to import data into their clouds, they often use cloud egress charges to deter customers from exporting or accessing data outside of their cloud infrastructures. Thirty-four percent of organizations claim that these egress charges impact their use of cloud storage. Fifty-six percent of respondents see increased costs as a negative consequence of egress charges (see Figure 6), which is slightly higher than last year's study in which 49% reported higher cloud storage costs.

Thirty-seven percent of respondents claim they moved data to a new service provider, such as Wasabi Technologies, that have either no or reduced egress charges, and this is up from 26% of respondents last year. Furthermore, 32% claim egress charges slow down their adoption of cloud storage. Organizations that underestimate the amount of data moving back and forth from cloud to on-premises are occasionally surprised by large bills for egress fees. In some cases, egress charges result in organizations repatriating their data back to their on-premises infrastructure (cited by 27% of respondents).

Organizations looking to use a multicloud environment for their future infrastructure resource needs should note that egress charges will have an impact, especially if datasets are moving back and forth between hyperscaler clouds. In our discussions, a mid-level manager told us the high costs of egress charges and data movement in addition to the time required to move large volumes of data slowed down their adoption of cloud.

"The egress costs and the data movement costs involved in doing [data migration], and just the sheer amount of time of moving hundreds of terabytes of data into and out of the cloud, it just makes it impractical [for us]."

– Mid-level management, 5,000-9,999 employees, $1bn-$2.49bn revenue, financial services

Hybrid Cloud Storage Maturity Model 2021

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Pure Storage Conclusion

For many organizations it is their backup, disaster recovery and archiving requirements that have become a gateway to their cloud adoption. According to 451 Research survey findings, as early as last year, 63% of organizations surveyed were found to be using a hybrid cloud model for cloud storage, with 63% of respondents already using cloud storage for their data protection needs (41% for long-term storage and 22% for cloud-based backups)[1].

The key for successful hybrid cloud deployments is providing solutions, such as data protection, combined with data management capabilities. Designing a seamlessly unified hybrid cloud is complicated, and your data layer strategy can make or break your hybrid cloud design. As this report shows, storage has a direct impact on application design, mobility, and the APIs that developers code. Pure Storage data services give you a unified platform for your storage regardless of its location. Ensuring your data has frictionless mobility to move as your business needs evolve.

To summarize, a successful hybrid IT architecture includes best-in-class on-premises solutions such as the Pure Storage FlashArray offering with Purity Data Services deployed your way. This hybrid architecture brings a robust enterprise experience to your hybrid and multicloud environment through Pure Storage Cloud Block Store (CBS). Cloud Block Store shares the same Purity operating environment as our FlashArray offering, allowing for a seamless integration and the same world-class data services. The Purity Data Services that save you space on premises are also recommended in the cloud, deduplication and compression for data reduction will save both space and money on cloud storage too.

Relying on the same integrations with Pure Data Services across your hybrid cloud architecture and adding your cloud vendor of choice provides you with true choice and flexibility. Choosing to partner with Pure Storage will elevate your experience to another level altogether, as measured by a net promoter score of 85.2. Find out what's behind the Pure Storage promise to 'Uncomplicate Data Storage, forever.'

Hybrid Cloud Storage Challenges and Considerations (infographic)

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Uncomplicate Data Storage, Forever

1 Source: 451 Research's Voice of the Enterprise: Cloud, Hosting & Managed Services, Workloads & Key Projects. 2021.