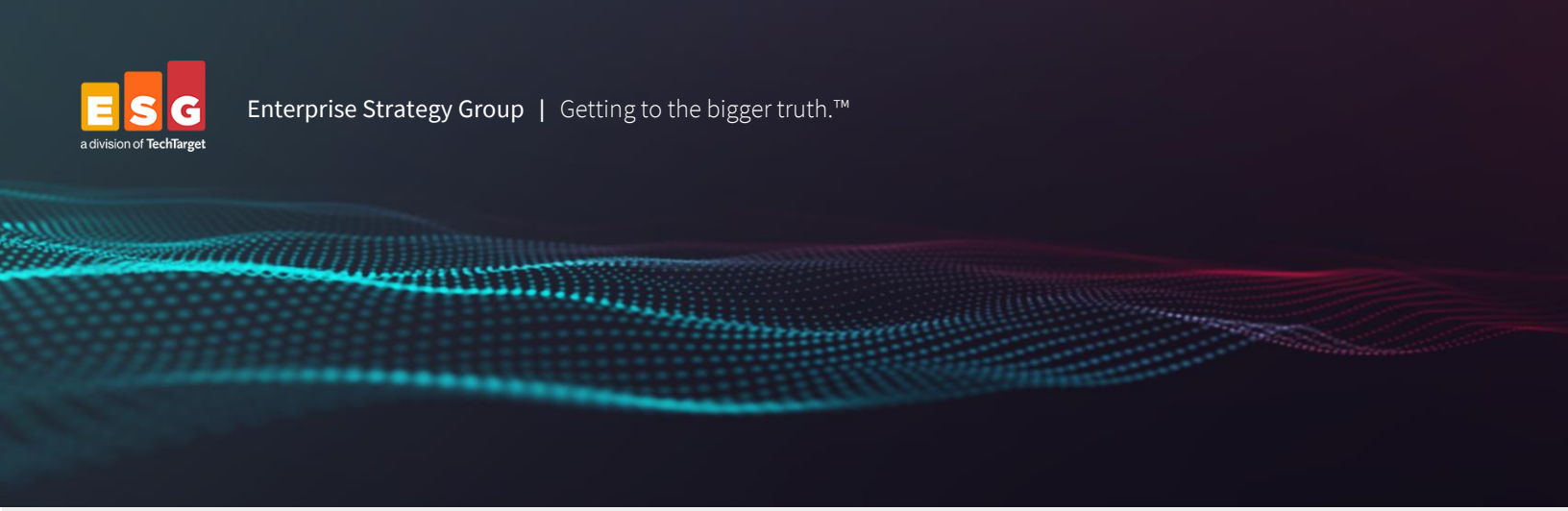

ESG WHITE PAPER

NetApp Keystone Storage as a Service for the Hybrid Cloud

Modernize Data Center and Hybrid Cloud Storage with NetApp

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Introduction

IT's role in business has evolved from being a cost center to serving as a revenue creator, and that change has fundamentally shifted IT's priorities when it comes to infrastructure design and architecture. Today, the emphasis is on acceleration. However, as IT leaders adapt to these shifting priorities, they often underestimate how quickly their environments will become disaggregated across multiple sites spanning public cloud providers and data centers.

The fact is that IT infrastructure is now hybrid (on and off premises), and it will remain so for the foreseeable future. Businesses must improve agility and operational efficiency across their *entire* IT infrastructure landscape but especially within the data center. That's because there are simply not enough people and not enough budget money to throw around trying to accelerate operations using traditional systems alone.

In addition, each budget and personnel allocation comes with a significant opportunity cost: It steals resources away from what should go toward creating additional digital initiatives to increase revenue and improve operations overall. What they should be doing instead is striving to achieve "cloud-like" agility on-premises and across their hybrid cloud environments. And smart organizations are doing just that—investing in as-a-service consumption models for on-premises infrastructure, especially storage. Many of them would benefit from assessing NetApp and its Keystone storage-as-a-service offering.

IT Must Modernize to Keep Pace

ESG research highlights the challenge of contemporary IT environments and makes the case for modern storage that can keep pace with the prevalence of digital business activity. The findings show that 59% of IT decision makers now report that data is their business. An additional 22% of respondents indicate that data currently helps to support their business, but they plan to develop new data-centric products in the next 24 months.[1]

And as businesses require more from their IT organizations, the pressure to accelerate operations increases. Sixty-seven percent of IT leaders surveyed by ESG agree that their teams are feeling under stress to accelerate IT infrastructure provisioning and deployment to support developers and various other departments across the business. In fact, nine out of ten IT groups are reportedly moving faster than three years ago, with 41% of them accelerating operations by more than 50%.[2]

As demands on IT scale, the data under management is scaling, too: ESG calculates a 35% annual growth rate for on-premises capacity on average.[3] That situation is causing IT infrastructure sprawl, especially in regard to storage. For example, many organizations are increasing their multicloud adoption, with 86% of organizations leveraging more than one public cloud provider and 65% leveraging more than two.[4]

Although the majority of IT organizations are using multiple public cloud providers in meaningful ways, inevitably, the huge scale and broad distribution of IT infrastructure is adding complexity. Sixty-four percent of survey respondents agreed that the complexity of their IT infrastructure is actually slowing operations and digital initiatives. And when it comes to data storage in particular, 64% of respondents reported that storage infrastructure requirements and spending are hard to predict.[5]

[1] Source: ESG Research Report, *Data Infrastructure Trends*, November 2021.
[2] Ibid.
[3] ESG Survey Results, *2021 Data Infrastructure Trends*, September 2021.
[4] Source: ESG Research Report, *Application Infrastructure Modernization Trends Across Distributed Cloud Environments*, March 2022.
[5] Source: ESG Research Report, *Data Infrastructure Trends*, November 2021.

Further increasing the urgency to modernize is the problematic skills shortage affecting so many IT organizations. For instance, 39% of ESG survey respondents say they are dealing with skills shortages in IT architecture and planning,[6] and a large majority—76%—have taken on added/new responsibilities to support their organizations' digital transformation initiatives or are at least under pressure to do so.[7]

Nevertheless, 64% view data center design as strategic and believe it can lead to a competitive advantage, and modernization offers an opportunity to become more cloud-like in general. When IT leaders were asked about their organizations' strategy for their on-premises data center environments over the next three years:

- 50% identified the need to improve connectivity/interoperability with public cloud infrastructure.
- 46% identified the need to invest in technologies that provide a cloud-like experience on-premises.[8]

On-premises As-a-service Infrastructure Is Transforming IT Operations

But how are IT organizations planning to modernize their on-premises data center infrastructure environments? ESG is observing an uptick in the adoption of consumption-based models for procuring on-premises infrastructure—51% of surveyed organizations say it is their preferred procurement model versus traditional CAPEX models, and 52% report that they are already using a consumption-based model for on-premises infrastructure.[9]

Adopting an as-a-service/pay-for-use model accelerates IT operations and reduces the burden on IT admins, allowing them to better support new digital initiatives and fuel competitive success. As Figure 1 shows, the top benefits are all acceleration-focused. Additional benefits relate to risk reduction and giving IT teams more freedom to tackle other mission-critical tasks.[10]

Figure 1. Benefits of a Pay-for-use Model for On-premises Infrastructure

Source: ESG, a division of TechTarget, Inc.

[6] Source: ESG Research Report, *2022 Technology Spending Intentions Survey*, November 2021.
[7] Source: ESG Research Report, *Data Infrastructure Trends*, November 2021.
[8] Source: ESG Research Report, *Application Infrastructure Modernization Trends Across Distributed Cloud Environments*, March 2022.
[9] Source: ESG Research Report, *Data Infrastructure Trends*, November 2021.
[10] Ibid.

It is worth remembering, though, that IT today is not "cloud only" or "data center only." It is hybrid. Therefore, modernization efforts must not only improve agility and accelerate operations inside the data center, but also simplify the whole hybrid cloud environment.

NetApp Keystone: Storage as a Service for the Hybrid Cloud

NetApp Keystone (see Figure 2) is a pay-for-use, on-premises storage-as-a-service offering with a rich set of data services, including CIFS, SMB, iSCSI, FC, and S3. NetApp designed this solution to simplify hybrid cloud environments.

Key features or capabilities of Keystone include:

- Pay for performance - With a substantial number of outcome-based service tiers for both file and block storage, users can increase or decrease performance as their business needs change.
- Pay as you grow – NetApp offers predictable billing for subscribed committed capacity, plus pay-for-use pricing for burst capacity (up to 20% available on demand at the same rate).
- Bundled pricing – Bundle hardware, core OS, support, as well as Equinix colocation services for a single $/TiB/month price. Data migration services can be added to the Keystone invoice based on completed milestones.
- Flexible terms – Commit to as little as one year with 25TiB or more per site, then auto renew for another 12 months or cancel the service. Users can also choose to operate the Keystone infrastructure or be operated by a certified Keystone partner. NetApp offers a fully managed service for an additional monthly fee.
- Leverage the cloud - Enjoy single orchestration, provisioning, and management using NetApp Cloud Manager or Keystone APIs. Keystone allows you to leverage the cloud for data migrations, bursting, backup, disaster recovery, and tiering. (Cloud bursting is a configuration set up between a private cloud and a public cloud to deal with peaks in IT demand.)
- Automated tiering – According to NetApp, users save over 50% on storage costs by automatically tiering cold data to lower cost storage on-premises or in any of the major public cloud providers.
- Option to go OPEX - Going with a 100% OPEX model moves IT assets off your balance sheet and eliminates technology debt.
- Predictable availability – NetApp guarantees 99.999% uptime with Keystone STaaS, which translates into less than 27 seconds of downtime per month. Business continuity (RPO=0) is available for an extra monthly fee.

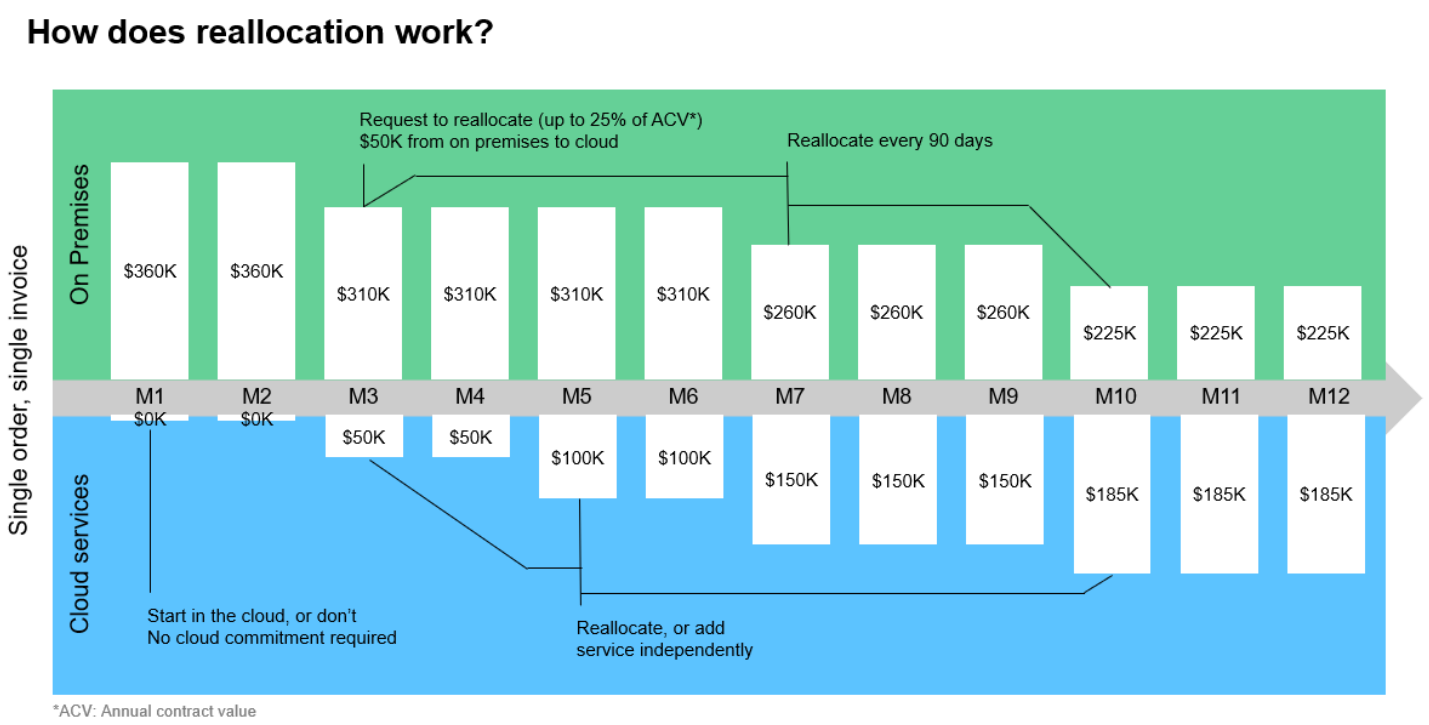
How NetApp's Hybrid Cloud Approach to STaaS Delivers Transformational Value

Adopting an as-a-service/pay-for-use model for on-premises storage delivers tremendous benefits to simplification, acceleration of operations, and digital initiatives, as well as helping to reduce risk to both IT and business decision making. NetApp's approach with Keystone takes those benefits a few steps further with how its design embraces hybrid cloud environments. Keystone offers several key enhancements for the hybrid and multicloud reality of contemporary IT, including:

1. One subscription across clouds - Keystone delivers an operational and financial model optimized for hybrid and multicloud IT environments. A single Keystone subscription (NetApp offers one-, two-, or three-year commitment options) can include both on-premises storage and cloud storage services, supporting all major cloud providers: AWS, Azure, and Google. By leveraging NetApp Keystone, IT organizations can also easily reallocate spending to align with their hybrid cloud strategy. When moving data from on-premises to the cloud, overall spending remains the same.

   Customers can purchase NetApp Cloud Volumes (CVO) and NetApp Cloud Backup (CBS) under the same monthly subscription as the on-premises storage services. Users can then re-allocate storage spending across clouds using Cloud Manager's Digital Wallet (see Figure 2). This capability is ideal for organizations expecting to migrate data or workloads to the cloud in future months, quarters, or years. NetApp delivers the freedom to shift the capacity allocation across sites while maintaining a single invoice.

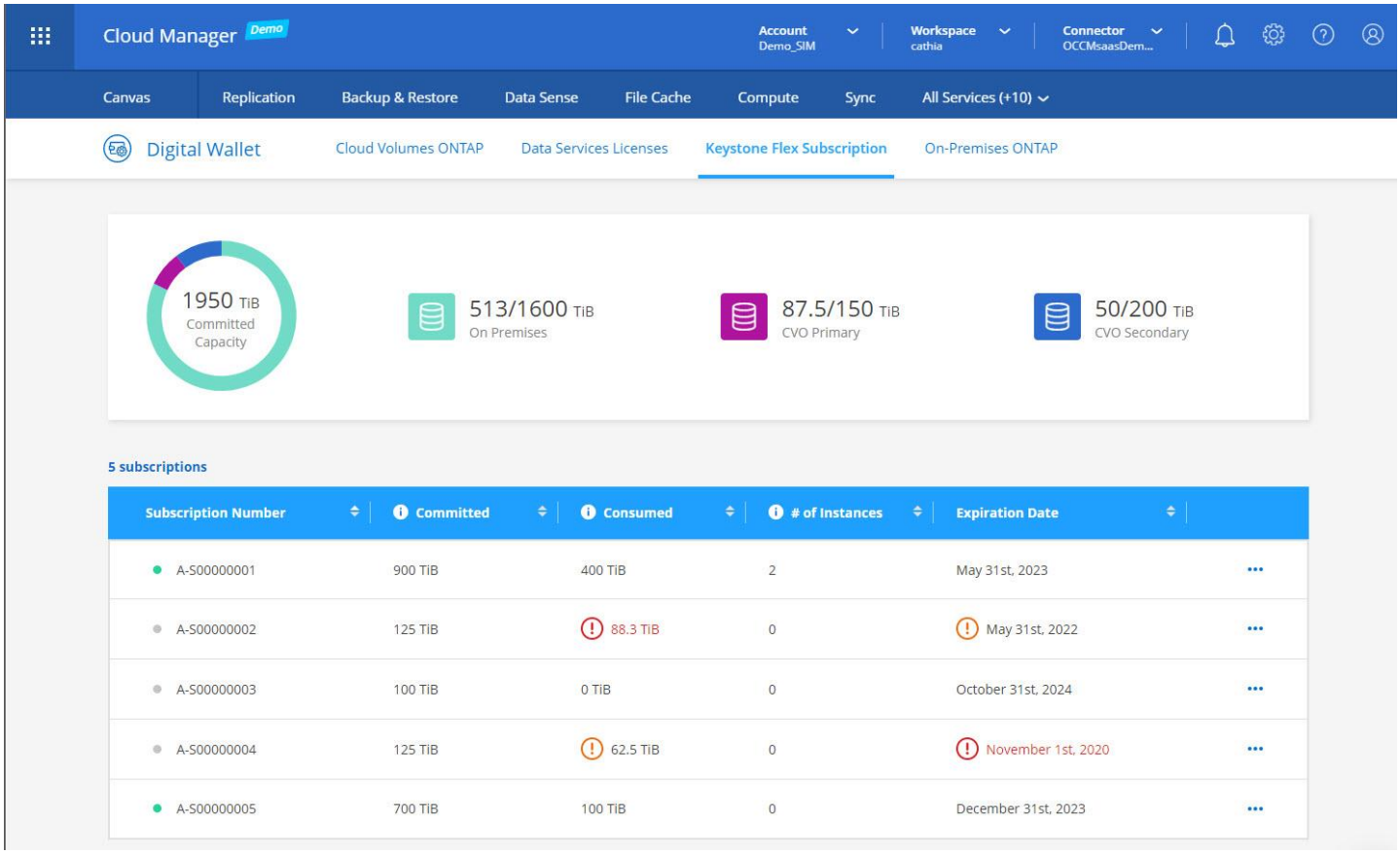
Figure 2. NetApp Keystone Capacity Reallocation



Source: NetApp

2. Native integration with Cloud Manager across hybrid or multicloud environments– NetApp offers single-pane-of-glass management to discover, visualize, monitor, provision, report, invoice, and manage subscriptions across on-premises and cloud storage services (see Figure 3). Users can simplify IT ops using Cloud Manager as a single management console for their hybrid and/or multicloud environment. Contemporary IT operations are built on hybrid, multi, and even cross-cloud interactions. Migrating apps and moving data across locations is a regular occurrence. NetApp Keystone provides a single management user experience that spans NetApp technology on-premises as well as NetApp Cloud Volumes ONTAP and NetApp Cloud Backup within a public cloud. Traditional silo-centric management is an impediment to modern operations. Achieving a single comprehensive view, like what Keystone offers, is essential for IT organizations to optimize operations moving forward.

Figure 3. NetApp Keystone Integration with Cloud Manager



Source: NetApp

3. Multiple service tiers offering granular flexibility to right-size your storage environment – Keystone offers a high number of service options (see Figure 4), including a newly introduced Performance service tier designed to address the low-latency, high performance demands of OLTP, OLAP, VDI, containers, and software development workloads. With Keystone, users have tremendous flexibility to select the optimal cost per performance for their storage environment to match their workload requirements.

4. Built-in data protection and tiering – Core data protection and tiering capabilities, such as NetApp Snapshot copies, vaulting (NetApp SnapVault), replication (NetApp SnapMirror), WORM compliance (NetApp SnapLock Enterprise), and data tiering to a NetApp target are built into the Keystone standard rate, simplifying data protection, reducing overall business risk, and ensuring that data is being protected. Users just need to add the low-cost storage capacity required for their data protection needs.

5. Keystone Advisor in Active IQ – NetApp combines the power of AI insights and NetApp Active IQ with Keystone to assist in making recommendations on which existing NetApp clusters should be converted to a Keystone service.

Figure 4. NetApp Keystone Storage-as-a-service Options

	File and block					Object	Cloud services*	
	Extreme	Premium	Performance	Standard	Value	Object	Cloud Backup** (all cloud)	Cloud Volumes ONTAP®** (all cloud)
Workload type	Analytics, databases	VDI, virtualization apps, SW dev	OLTP, OLAP, VDI, Containers, SW dev	File shares, web servers	Backup	Archive	Backup	DR, Dev/test, Biz Apps
Max IOPS/TiB (effective capacity)	12,288	4096	2048	512	128	N/A	N/A	N/A
Max throughput MBps (32KB/IOP)	384	128	64	16	4	N/A		
Latency	<1 ms	<1 ms	<1 ms	<17 ms	<17 ms	N/A	N/A	N/A
Protocols	NFS, CIFS, iSCSI, FC					S3	S3	NFS, CIFS, iSCSI

*Cloud-native services such as compute, storage, networking will be invoiced by the cloud provider.
**Dependent on the cloud storage and compute characteristics.

Source: NetApp

Potential Hybrid Cloud Use Cases

Keystone provides an ideal way to support workload migrations to the cloud. IT simply needs to move the workloads from Keystone on-premises to Cloud Volumes ONTAP located within AWS, Azure, or Google Public Cloud—all while leveraging the same subscription. As data moves, the cost is also transferable from the on-premises environment to the cloud.

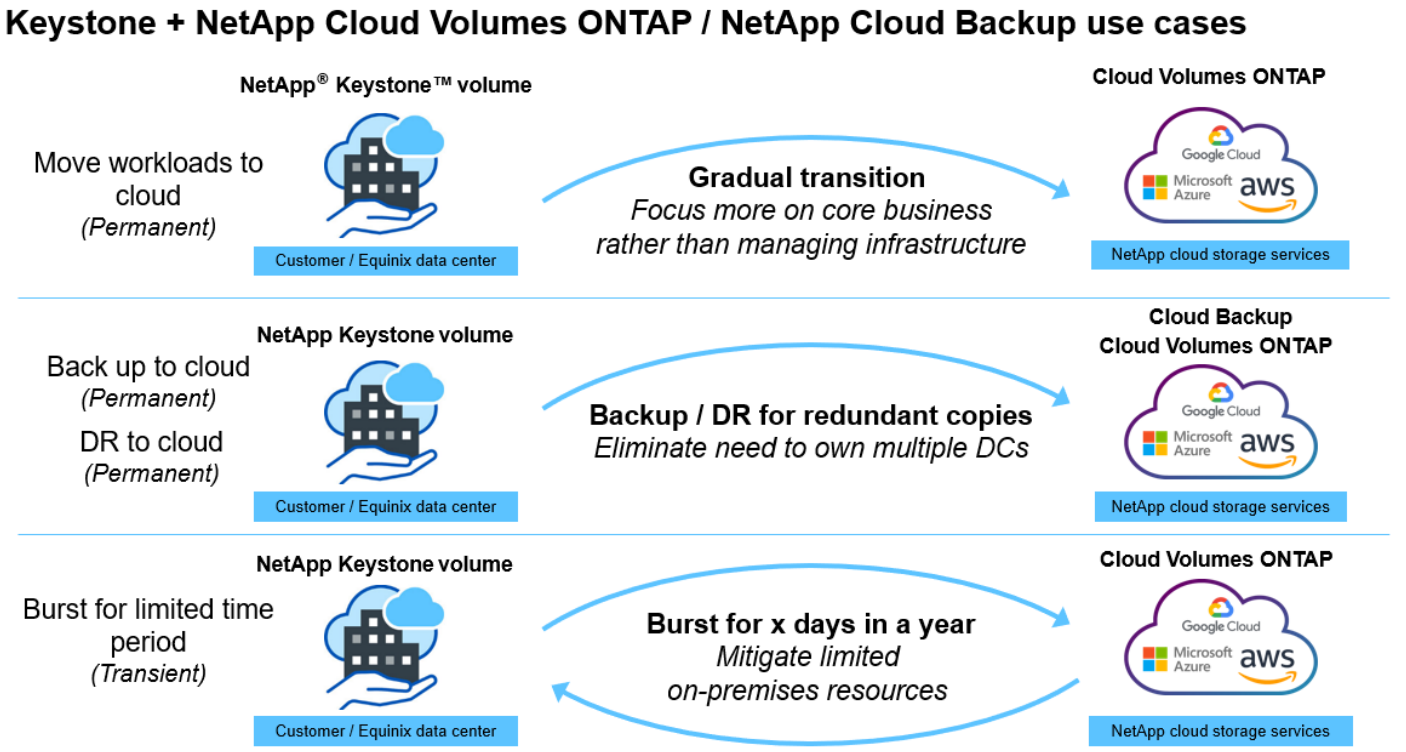
Keystone also supports backup to the cloud, all on NetApp technology. This capability reduces the need to manage multiple data center sites independently.

When cloud bursting occurs, IT can use the same technology on- and off-premises, which simplifies management of application environments that are spread across hybrid cloud infrastructures.

The simplicity and hybrid cloud flexibility offered by Keystone are vital to successful digital transformation. It allows IT to go beyond modernizing the data center, to modernizing the hybrid cloud. Modern IT is now connected in this way, and as-a-service consumption offers simplicity and agility not just to on-premises environments, but to the hybrid cloud environment, too. It's one subscription that spans everything.

And again, that flexibility extends to supporting future cloud migration planning. A NetApp Keystone subscription is transferable, so when an organization undertakes its next application migration project, it can move costs to cover NetApp technology located on any of the major cloud providers. And of course, it all comes with enterprise-level storage capability and integrated data protection.

Figure 5. NetApp Keystone Example Hybrid Cloud Use Cases



Source: NetApp

The Bigger Truth

The momentum related to moving to an OPEX/flexible consumption model on-premises is clear. This is happening now and will continue to happen in the future—driven mainly by a need for agility, flexibility, getting out of managing storage infrastructure, reallocating resources to more strategic initiatives, and overcoming in-house skills gaps.

This is a solution for NetApp customers who aim to enjoy cloud economics and cloud flexibility on-premises, with the ability to move workloads to the cloud as needed later on. And it's all under a single subscription with a single experience for management, orchestration, and billing. That is what organizations are looking for in a hybrid cloud solution.

NetApp's approach is targeted at that need for acceleration, simplicity, and the right level of agility. Bringing a cloud operational model on-premises definitely has benefits, but the goal is not to create another silo separate from everything else. Rather, the goal is to have it connect with everything. This is what NetApp is doing.

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