

Nasuni vs. NetApp for Next-Gen Cloud File Storage

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Nasuni® Cloud File Storage vs. NetApp Cloud Volumes ONTAP, Cloud Volumes Services for AWS and Google, and Azure NetApp Files

PRODUCTS

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File-based workloads are at the heart of innovation and of collaborative workflows. Enterprises today store multiple petabytes of unstructured file data. They increasingly need to process that data in the cloud and to access and collaborate on that file data from many different locations.

Many file storage solutions cannot scale to meet the needs of large enterprises or today's demanding enterprise requirements. Consequently, most enterprises now rely on multiple point solutions, each with its own management overhead. Disparate backup solutions and disaster recovery mechanisms add layers of complexity, cost, and risk to the file infrastructure equation.

Enterprise technologists responsible for making files available for processing or collaboration wherever those files are needed are realizing that they need a next-generation file infrastructure that:

- eliminates silos of data,
- enables workloads to migrate to the cloud, and
- meets the secure access and collaboration requirements of a distributed enterprise.

NetApp hardware-based filers are familiar to most enterprise technologists. As enterprises embrace hybrid and multi-cloud initiatives, it is natural that they consider NetApp's combination of on-premises and cloud file services as a possible cloud file storage solution. However, as they migrate high-value workloads to the cloud, many enterprises are seeking a next-generation cloud file infrastructure that simplifies rather than adds complexity to the process of storing, sharing, and protecting their file data assets. Thus, enterprises evaluating cloud file storage frequently place NetApp and Nasuni on their shortlist.

Nasuni and NetApp Background

NetApp was founded in 1992 as Network Appliance. Its file servers eventually dominated the NAS/NFS marketplace. In 2002, it also began to sell block storage SANs. It acquired Spinnaker in 2003 to address customer needs for greater and simpler scalability, availability, and reliability. Though these needs are real, the resulting Clustered Data ONTAP solution did not gain wide acceptance for more than 10 years.

NetApp's leaders recognize that enterprise requirements are changing again. It is now pivoting to become a hybrid and multi-cloud data management services company, rather than a seller of *net*worked storage **appliances**. Some of NetApp's Cloud Services are based on NetApp arrays installed in cloud data centers. Other services are based on virtualized instances of ONTAP in the cloud. Beyond ONTAP, NetApp is filling gaps through acquisitions under the umbrella of its Cloud Services portfolio.

Nasuni was founded in 2008 by Andres Rodriguez. While serving as the CTO of the New York Times, Rodriguez was responsible for storing, protecting and managing massive and rapidly growing file repositories. He saw that existing NAS devices, backup solutions and disaster recovery infrastructures would not meet the need.

Rodriguez envisioned a new approach to cloud file storage modeled on the Akamai content distribution network, which offered file storage as a service with everything included. This "born in the cloud" solution would bring together NAS file services, data protection, and disaster recovery capabilities in a unified platform that would leverage the low cost and scalability of cloud object storage. It would fit into existing data center infrastructures by supporting standard NAS file access protocols; but with the scalability, durability, and global reach of cloud object storage. Rodriguez' idea for **NAS Unified** was born.

Features in Common

Nasuni Cloud File Storage and NetApp's ONTAP-based storage have many features in common. For example, both Nasuni and NetApp offer cross-protocol file access and space-efficient snapshots, as well as Active Directory and LDAP integration.

NetApp Strengths

NetApp's distinctives include support for both block-based and file-based workloads in their current FAS and AFF storage systems, some of which deliver end-to-end NVMe/FC block storage. These systems provide block storage at sub-millisecond latencies for demanding enterprise workloads. NetApp also provides massive on-premises scalability of up to

63PB of all-flash storage in a 24-node cluster. NetApp also provides up to 368TB of all-flash storage per rack unit; one of the highest storage densities in the industry.

Enterprises implementing a hybrid or multi-cloud data strategy can implement a data fabric based on NetApp Cloud Services. Just as a lack of feature parity slowed the adoption of Clustered Data ONTAP, NetApp's cloud-based offerings lack some features of their on-premises offering and are limited to just 368TB per Cloud Volumes ONTAP instance, and 100TB per volume. Azure NetApp Files offers greater scalability, but still much less than its on-premises solution.

Nasuni's Modern Cloud-Native Architecture

Nasuni distinguishes itself in ways that matter to many organizations that are seeking a next-generation cloud file infrastructure. Nasuni unifies the capabilities of enterprise NAS, backup solutions, and disaster recovery infrastructure by using object storage as its back-end store. The result is a next generation file storage solution that is unlimited, durable, georedundant, and economical.

The heart of the Nasuni platform is its patented cloud-native global file system, UniFS®, the first file system that resides and scales in object storage. Virtual caching appliances deployed on-premises or in the cloud provide secure file-based access to an enterprise's global file repository at local network speeds.

Nasuni eliminates silos of data wherever they exist:

- Scales to fit all files globally
- Supports any level of performance
- Frees customers to use any cloud they want
- Enables rapid secure access over any network
- Eliminates the need for separate backup and DR solutions
- Serves thousands of sites with simple, centralized, single pane of glass management

Industry sectors whose #1 companies have selected Nasuni to provide next-generation cloud file infrastructure include:

- Consumer Goods
- Creative Agencies
- Manufacturing
- Architecture & Construction
- Technology
- Energy

Scalable Cloud-native File Storage

As Nasuni's founders anticipated, the world of file data has changed. The expanded use of unstructured data in the enterprise has created new dimensions of scalability. Enterprises now capture file data from more sources and in a greater variety of file sizes than in the past. Some new applications create billions of tiny files, while others create individual files larger than 25TB.

Capacity. One dimension of scalability is, of course, capacity. When it comes to storage capacity in the cloud, Nasuni is unsurpassed because it is unlimited. Nasuni can handle trillions of files of any size, stored in

as many or as few directories as necessary. In contrast, NetApp Cloud Volumes ONTAP is limited to 16TB per file, 100TB per volume, and 368TB per instance.

Locations. Another new dimension of scalability is the dramatic increase in the number of locations that might need access to a given file or set of files. Nasuni Edge Appliances eliminate the need for file servers or NAS devices at edge locations. With Nasuni, central IT deploys an edge appliance as a virtual machine in any office or cloud data center. Enabling access for remote workers is simply a matter of enabling that option in the management console.

The Nasuni Edge Appliance is stateless and uses a small amount of local flash memory or hard drive capacity to cache files used for that location. Its intelligent edge caching capabilities include caching hot/new files, pinning, and pre-caching. New or updated blocks of data within any file are compressed, globally deduplicated, and encrypted before being sent to cloud object storage. Nasuni reduces storage at the edge by up to 90% while serving 98% of file requests from the local cache, avoiding cloud latency and egress charges.

NetApp's Global File Cache product adds the recently acquired Talon FAST environment on top of an existing NetApp cloud service (Azure NetApp Files, Cloud Volumes ONTAP). It extends NetApp SMB/CIFS access to edge locations without the overhead of managing multiple ONTAP arrays. The Talon solution is deployed as caching software installed on a physical Windows server or Windows Server virtual machine in each edge location. Once installed, it cannot be removed without impacting the functionality of the server instance and may require a full rebuild of the server.¹

Since NetApp Talon's caching product sits on top of NetApp's cloud file services, it adds another storage technology that enterprises must license, deploy, and manage.

Cloud-native. Nasuni caching appliances can be deployed in the cloud to provide fast file access to workloads such as VDI in the cloud. Nasuni customers experience high-performance in the cloud without disabling data efficiency features such as deduplication. In contrast, NetApp requires that deduplication be disabled to take advantage of NVMe caches in the public cloud.

Synchronization. Nasuni's synchronization is performed by Nasuni's Orchestration Center (NOC) in the cloud. The NOC provides a control plane that is separate from the data path. It provides scalable global file locking and sophisticated version reconciliation that enables file change synchronization across thousands of sites while using minimal bandwidth.

In contrast, NetApp, even with its recent Talon acquisition, does not offer an elastic, multi-region cloud service for scalable global file synchronization and global file locking. Synchronization is performed by Talon software running on local Windows servers communicating with NetApp Talon Core Clusters in the cloud. This system requires the overhead of Talon software connecting to NetApp in the cloud and a Windows File Server at the edge. The fact that ONTAP's deduplication is not global like Nasuni's, but is restricted to each 100TB maximum namespace, negatively impacts both data efficiency and performance.

As with synchronization, Nasuni's architecture distributes global file locking in the cloud, providing the scalability to perform tens of millions of file locks/day. NetApp's "real-time central file locking" enabled by

1. "Talon FAST" Requirements for Physical and Virtual Deployments" <http://www.talonstorage.com/nologin-files/documentation/Requirements%20for%20Talon%20FAST%20Deployments.pdf>.

FIGURE 1

Scalable Cloud-native File Storage—Summary Comparison

		Nasuni	NetApp
Storage capacity in cloud-native storage		Unlimited	0.368PB
File locking		Global, Distributed, Cloud-native	One ONTAP instance per cluster
Core storage technology		Object	Block
File size (maximum)		Unlimited	16TB
Files per volume (maximum)		Unlimited	2 Billion
Volume size (maximum)		Unlimited	100TB
Directory size (maximum)		Unlimited	320MB
Directories (max)		Unlimited	100,000
Files per name space		Unlimited	400 Billion
Capacity per name space		Unlimited	100TB (Cloud Volumes ONTAP)
Software-defined storage in the public cloud	AWS	Unlimited object storage	0.368PB
	Azure	Unlimited object storage	13.7PB (ANF)*
	Google Cloud	Unlimited object storage	0.368PB
Control plane for global file synchronization and global file lock		Elastic, multi-region cloud service with active/active support	ONTAP instance + Global File Cache (Talon Fast) server in the cloud

*Based on 550TB per capacity pool, 25 capacity pools max per NetApp account. <https://docs.microsoft.com/en-us/azure/azure-netapp-files/azure-netapp-files-resource-limits>

Talon depends on continuous access of Talon software to a NetApp filer instance in the cloud, a multi-step process that has the potential to impact performance.

Efficient use of the cloud. Nasuni customers also experience much lower costs when they deploy Nasuni caching appliances in the cloud due to Nasuni’s use of object storage as the back-end store. In contrast, NetApp cloud services require the use of much more expensive NetApp storage or virtual machine block storage in the cloud to store data. (Figure 1.)

KEY QUESTIONS:

Is your company looking to eliminate the cost and complexity of managing multiple data silos?

Is your company experiencing unpredictable capacity growth across multiple locations?

Does your company need to provide its employees with fast access to corporate data across hundreds or thousands of locations?

Does your company have difficulty managing, protecting, and quickly recovering the file data on which its staff and business processes depend?

If so, Nasuni may be the answer to your file storage needs.

Integrated Data Protection

Nasuni provides integrated data protection and disaster recovery capabilities for the entire file infrastructure, not just at the edge. Thus, Nasuni eliminates cost and complexity both at the edge and at the core.

Compared to installing a small NetApp storage appliance, NetApp’s Global File Cache (GFC) does reduce cost and complexity at the edge by eliminating the need for file data protection in branch and remote offices. However, the NetApp solution still requires Windows Server instances at the edge locations.

Nasuni’s integrated data protection goes far beyond NetApp. Like GFC, Nasuni eliminates the need for file data protection at the edge. Unlike NetApp, Nasuni also eliminates the need for a separate file data protection infrastructure at the core. Nasuni eliminates the capital and operational costs of maintaining file backup and disaster recover infrastructures for edge locations and at the core.

Nasuni writes all file changes, called “snapshots”, as immutable objects to object storage (either public cloud or on-premises). Its edge appliances provide SMB and NFS access to that object storage, intelligently caching data to deliver low-latency, local LAN performance at each edge location. Nasuni Edge Appliances can also be deployed in the cloud to bring those same benefits to cloud-based workloads.

End-to-end encryption. Nasuni encrypts new data chunks before propagating them to object storage. The customer controls the encryption keys. Neither Nasuni nor the cloud provider have access to the keys.

Integrated, unlimited snapshots. Nasuni provides continuous file versioning, which captures changes as they occur on every edge appliance and stores the file system deltas as a snapshot in object storage. Recovery points can be up to every few minutes, and recovery times just a few minutes more to restore a single file, a whole directory, or the entire file system. The need for traditional third party backup infrastructure for files is eliminated.

Integrated ransomware recovery. If an enterprise experiences a ransomware attack, it can revert the global file system to a point in time just before the attack.

Integrated disaster recovery. Since each Nasuni Edge Appliance has access to the entire file system, every edge location effectively provides disaster recovery capabilities to the enterprise. And new caching appliances can be deployed at the edge or in the cloud in approximately 15-minutes.

Integrated business continuity. Extending secure file access to employees at home is extremely simple. Checking a box via the centralized multi-site management console enables AD or LDAP-authenticated access for that location’s employees. (Figure 2.)

KEY QUESTIONS:

How much does your business spend each year for backup and recovery software, hardware, and services? At the edge and at the core?

Does your file infrastructure provide for integrated ransomware recovery with up-to-the minute snapshots?

Does your file infrastructure enable end-user recovery of deleted files and prior versions of files?

Simplified Management

When most enterprise storage vendors talk about simplified management, they mean that storage management is via a web interface or vCenter plug-in, and they automate routine storage tasks. Nasuni simplicity goes farther.

Nasuni’s intelligent web-based Nasuni Management Console certainly does automate many storage tasks. But when Nasuni says it simplifies management, it mainly means that its customers eliminate silos of data wherever they exist. Nasuni eliminates

- multiple separate file storage systems,
- backup software licenses and dedicated backup storage systems,
- disaster recovery infrastructure and co-location contracts, and
- tedious volume management tasks.

Nasuni’s sophisticated file version controls, global file lock technology, and policy-based management also eliminate the need for separate enterprise file sync-and-share solutions with their licensing and management overhead.

NetApp cloud services offer the data services enterprises expect, but with the management overhead of a legacy system. For example, in an era where individual files can exceed 25TB, infrastructure specialists must still manage individual NetApp volumes that are limited to 100TB each.

While NetApp Global File Cache (Talon) eliminates the need to protect file data at the edge, it adds another layer of management on top of existing NetApp storage management requirements. The NetApp core

FIGURE 2

Integrated Data Protection Summary Comparison

	Nasuni	NetApp
Encryption	Integrated end-to-end encryption using customer-controlled keys	\$ (extra cost)
Integrated data protection for edge storage	✓	\$ Requires NetApp Global File Cache (Talon FAST)
Integrated data protection for core storage	✓	\$ Requires third-party backup software
Integrated disaster recovery	Every edge instance has access to global file infrastructure New setup in 15 minutes	●
Integrated business continuity	✓	●
Snapshots per volume	Unlimited	1,023
Immutable object storage at the core	✓	●
Continuous versioning of files	✓	●
Edge appliance technology	Hardened Linux OS (physical or VM)	Windows server (physical or VM)
Third-party backup software	Not needed	\$ Adds complexity
Storage infrastructure for backups	Not needed	\$ Adds complexity

FIGURE 3

Simplified Management Summary Comparison

	Nasuni	NetApp
Web-based management console for central management and global control of cloud storage volumes, edge caches, snapshots, backups, recoveries, and shares	Integrated	Requires multiple management consoles, Global File Cache, and multiple third-party products
Eliminates need for third-party backup software and infrastructure	✓	●
Eliminates need for third-party disaster recovery infrastructure	✓	●
Unlimited scalability in a single global file system	✓	●

FIGURE 4

Cost-effective—Summary Comparison

	Nasuni	NetApp
Core file storage technology	Object storage in the cloud or on-premises	High-performance (and high-cost) block
Edge technology	Hardened Linux caching appliance (physical or virtual machine)	NetApp array for storage, or Windows Server/Windows VM for Global File Cache

storage infrastructure still requires legacy third-party backup software and target hardware, and third-party disaster recovery infrastructure with its associated costs and management complexity. (Figure 3.)

KEY QUESTIONS:

How much more agile could your IT team be if they had a single file storage platform to manage that covered all file workloads and provided integrated file sharing and self-service file recovery capabilities across the entire enterprise?

How long would it take for IT to restore all file access in case of a disaster? How much downtime did your business experience last year? How much does an hour of downtime cost your business?

Cost-effective Next Gen Solution

Nasuni is inherently more cost-effective than NetApp. NetApp cloud services use premium-priced block storage in the public cloud. Nasuni uses much less expensive object storage as its backing store, and only a small footprint of block storage to cache active files and provide high-performance SMB and NFS-based access to them. As such, Nasuni provides a significant cost advantage.

Nasuni also unifies primary file storage, data protection, and disaster recovery. That is what they mean by NAS unified (the “uni” in Nasuni). By eliminating the need for separate backup and disaster recovery infrastructures for file-based data, Nasuni customers typically reduce their total cost by 60% or more compared to a NetApp solution.

Nasuni also saves cost at the edge by reducing edge storage and management requirements. Nasuni caching appliances are based on a security-hardened Linux virtual machine, requiring near zero maintenance. Traditional NetApp arrays require the same management at the edge as they do in the enterprise data center. NetApp Global File Cache requires Windows Server at the edge. (Figure 4.)

Summary Conclusion

Both NetApp and Nasuni bring enterprise features and performance to cloud-based file storage.

NetApp offers high-density multi-petabyte storage on-premises, including high-performance block storage, that can connect to NetApp Cloud Services to create a hybrid cloud data fabric. Its Cloud Services are based on NetApp hardware filers managed by cloud providers or an ONTAP instance running directly on public cloud infrastructure. For multi-location enterprises, NetApp’s new Global File Cache reduces the complexity of extending NetApp file infrastructure to remote offices and branch offices. In either case, NetApp’s Cloud Services offer fewer features and less capacity than its on-premises solution.

NetApp Cloud Services have a track record of success with enterprise workloads including:

- Databases
- Virtual machines
- Off-site replication target for NetApp arrays (DR)

Nasuni was born in the cloud. Nasuni built its cloud file storage platform on a scalable cloud-native file system, a scalable cloud-native orchestration service, and intelligent edge caching. Nasuni creates value for enterprises through massive scalability in the cloud, integrated data protection, integrated file synchronization, global file locking, simplified management, and a lower cost structure.

Nasuni designed its cloud file platform to meet new and emerging enterprise file storage requirements, including:

- Simplified multi-site file storage that automatically adapts to unpredictable growth and changes in file usage patterns
- Group and project file shares, including massive files and massive file quantities
- Comprehensive, integrated data protection
- Rapid multi-site DR for file storage

Taken together, these capabilities make Nasuni an excellent choice for enterprises seeking a truly next-generation cloud file storage infrastructure. ■

About DCIG

The Data Center Intelligence Group (DCIG) empowers the IT industry with actionable analysis. DCIG analysts provide informed third-party analysis of various cloud, data protection, and data storage technologies. More information is available at www.dcig.com.



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