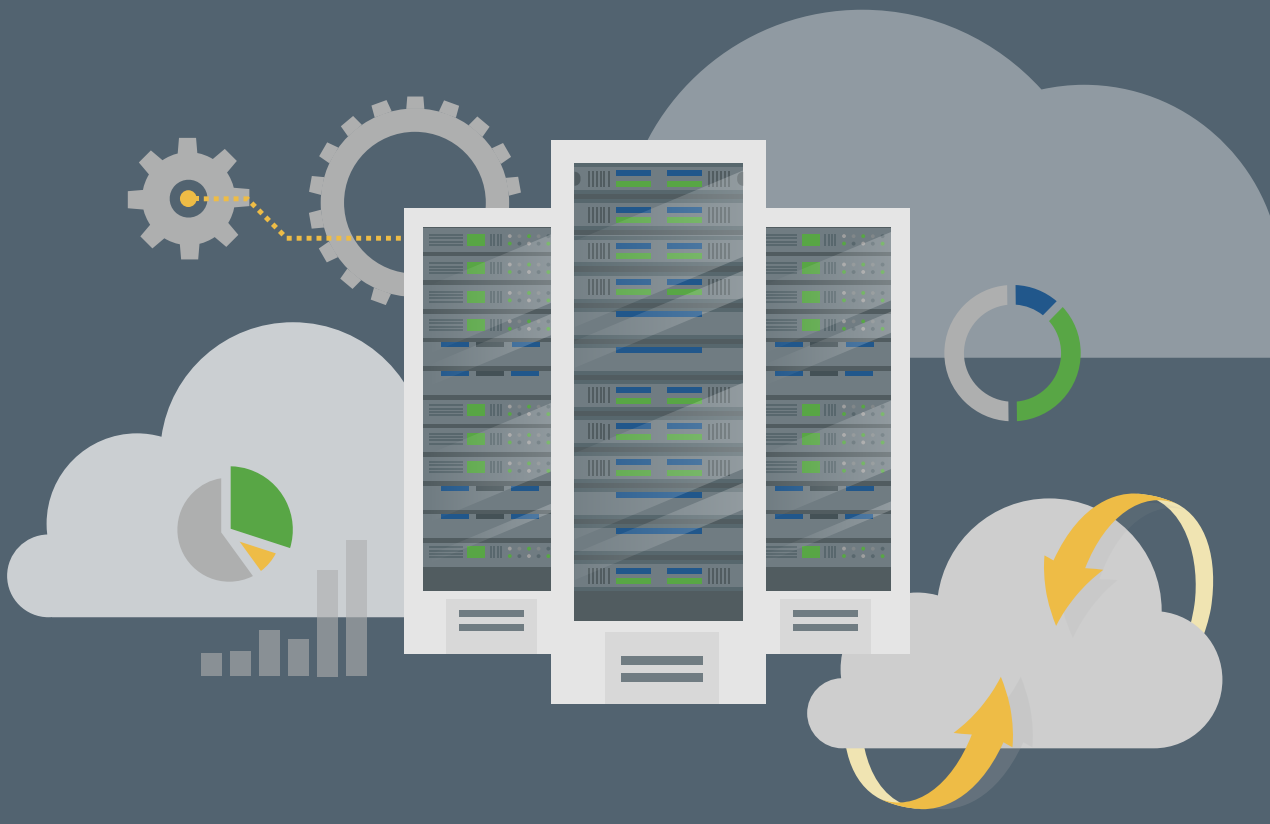
NASUNI | WHITE PAPER

Comparing File Storage Vendors on the Promise of the Cloud

SAVINGS, SIMPLICITY, AND SCALE



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The leading vendor options for modernizing file storage offer enterprises the functionality they need to **store, access, protect, manage, and secure unstructured file data efficiently and economically.** However, sorting through the cloud-based solutions that are now available to replace traditional file storage can be complicated given the different approaches and architectures offered by vendors. This paper was written to help stake holders – IT leaders, cloud architects, infrastructure and operations personnel, storage directors, heads of business, and more – think through the criteria for choosing the cloud file storage solution that best meets their needs and understand the options that are available to them today.

The Promise of the Cloud, the "Three S's"

Based on customer survey results and analyst reports, enterprises want cloud file storage solutions to offer advantages in three main categories: **Savings, Simplicity, and Scale**. The generally available cloud-based file storage solutions were evaluated against these three criteria:

Does it allow the enterprise to pay only for what it needs, scaling easily and swapping a cash-heavy CapEx purchase for a nimbler OpEx subscription? Total cost of ownership of a cloud file storage solution should be measured by both the hard costs it eliminates, including primary storage, backup, DR, WAN costs, data center footprint, etc., as well as the associated soft costs, such as the overhead to manage multiple vendors and contracts, and multiple software and hardware components.

Can it replace time-intensive, repetitive management tasks with less time-consuming management systems? How easy is it to consolidate all legacy file storage infrastructure, including redundant and siloed systems, to a centralized cloud or clouds of choice? And does it offer the flexibility to replace expensive, maintenance-heavy hardware with software-defined architectures and lightweight virtual machines?

How easy is it to modernize and scale file infrastructure without introducing latency that would slow file access for users? How quickly and easily can files be shared across locations? How fast can files be recovered across all locations after an accidental deletion, a regional or global disaster, or a ransomware attack?

Vendors Considered

There are numerous types of cloud-based file storage solutions available on the market today. However, a closer look reveals that not all offer solutions capable of providing a full transformation to modern, efficient, secure, cloud-based file storage infrastructure. This paper focuses on just the vendors that meet "Three S's" criteria and offer the stability and long-term viability required to store and protect enterprise file data.

INCLUDED

COMMERCIAL-GRADE CLOUD FILE STORAGE

Vendors in this category provide a modern cloud alternative to traditional file storage infrastructure (file servers, NAS, backup, DR, etc.).

To varying degrees, each addresses all the following criteria:

- ✓ The vendor is commercially viable, with strong financials and/or stable investors.
- ✓ The vendor provides general-purpose primary file storage for replacing file servers and NAS hardware, with support for industry-standard file sharing protocols (SMB, NFS) and existing drive mappings.
- ✓ The vendor offers additional, essential file services beyond primary file storage, including backup, DR, monitoring, and data analytics, among others.
- ✓ The vendor built its solution using at least one of the big hyperscalers (AWS, Azure, Google Cloud).

Five vendors offer cloud-based solutions that satisfy all the above:

1. Nasuni Cloud File Storage
2. NetApp Cloud Volumes ONTAP
3. Azure Files
4. Amazon FSx for Windows
5. Windows File Servers hosted in the cloud

EXCLUDED

SCALE-OUT CLUSTERED NAS

Solutions in this category offer robust capabilities geared toward high-performance computing, but are 3-4 times the cost of traditional file storage and fall short in all "Three S's" criteria.

***Examples**: Azure NetApp Files, Qumulo, and Amazon Elastic File System (EFS).*

APPLICATION-SPECIFIC FILE STORAGE

Solutions in this category focus only on specific file types, so they cannot be used for general-purpose file sharing.

***Examples:** Autodesk BIM360 and Adobe Creative Cloud.*

FILE GATEWAYS

Solutions in this category focus on the SMB market and have smaller customer deployments, or offer cloud storage gateways that focus on tiering infrequently used, low-value file data to the cloud.

***Examples:** CTERA and Panzura.*

CONTENT MANAGEMENT/FILE SYNC AND SHARE

Solutions in this category cannot be considered file server/NAS replacements because they don't support SMB and NFS file-sharing protocols, they don't provide edge caching, and they don't offer strong IT governance and data protection capabilities.

***Examples:** Egnyte, Microsoft SharePoint (Microsoft OneDrive for Business, Microsoft Teams), Amazon WorkDocs, Box, and Dropbox.*

Head-to-Head Comparison of Commercial-Grade Cloud File Storage Solutions

The five commercial-grade cloud file storage solutions can be scored according to the key capabilities required in this category. Each of these key capabilities have been grouped according to the "Three S's" discussed earlier in this paper:

SAVINGS					
FEATURE	NetApp	Azure	amazon FSx	Windows Server	NASUNI
Native object storage as primary storage	◔	○	○	○	●
Multi-cloud support to utilize lower-cost object storage	●	○	○	○	●
Eliminated file backup and disaster-recovery expenses	◔	◑	◑	◔	●
Data reduction	●	○	◑	◔	●
Ransomware recovery	◑	◑	◑	◔	●
Edge cache efficiency	◑	◑	◑	○	●
Total cost of ownership (annual cost/TB)	$$$	$$	$$	$$$	$

○ Does Not Deliver ◔ ◑ Partial ● Fully Delivers

SIMPLICITY

FEATURE	NetApp	Azure	amazon FSx	Windows Server	NASUNI
Centralized administration					
Rapid ransomware recovery					
Disaster recovery					
Automatic file data protection (backup)					
Streamlined file recovery (IT-assisted & self-service)					
Ease of user authentication					
Multi-site file synchronization					
NFS & SMB protocol support					
MacOS extended attribute support					

Does Not Deliver — Partial — Fully Delivers

SCALE					
FEATURE	NetApp		amazon FSx	Windows Server	NASUNI
Unlimited number/size of files, directories, volumes, users or snapshots	◑	◔	◔	◔	●
Global file system that can span multiple locations	◑	◔	◔	○	●
Minimal end-user latency	●	●	●	○	●
Rapid disaster recovery in all locations	◑	◑	◑	○	●
Rapid file restore for one or many files	◑	◑	◑	◔	●
Global file lock	◑	◑	○	○	●
Intelligent high-speed edge synchronization	◑	◑	◑	○	●

○ Does Not Deliver ◔ ◑ ◕ ● Fully Delivers

Vendor Synopses

NETAPP CLOUD VOLUMES ONTAP

NetApp

Overview

NetApp offers a wide range of block, file, and object-based data storage solutions, as well as infrastructure management, backup and recovery, business continuity, archiving, and compliance solutions. As NetApp tries to shift more of its revenue to subscription, it is bringing to market cloud file storage solutions based on its hardware-defined, on-premises technologies such as the Data ONTAP® storage operating system and the WAFL file system.

Strengths

NetApp set the initial standard for traditional Network Attached Storage (NAS) architectures and snapshot-based data protection with Data ONTAP. NetApp Cloud Volumes ONTAP is the NetApp cloud solution best suited for general-purpose file shares, which is why it is included in this comparison. This solution is a virtualized version of ONTAP that runs as a cloud compute instance and uses high-performance disk storage from public cloud providers to store file data.

Considerations

With its operating system and file system designed for on-premises hardware, NetApp Cloud Volumes ONTAP inherits the volume, capacity, snapshot, and file size limitations from its hardware origins. For edge caching and multi-site file synchronization, it requires the NetApp Global File Cache add-on from its Talon acquisition, which requires a full complement of Windows Servers that have to be purchased, patched, and maintained for file caching and synchronization. Administration is complicated by the extensive additional components required, including NetApp Cloud Volumes ONTAP primary and DR instances, Amazon Elastic Block Storage or Azure Disk Storage, FabricPool Tiering, Amazon S3 or Azure Blob object storage, NetApp Cloud Backup or other third-party party backup tools, and NetApp Global File Cache and its Windows Server Core instances and Windows Server Edge instances. Costs are higher than other options because of its reliance on high-performance disks in the public cloud and the extensive list of add-on components.

NetApp set the initial standard for traditional Network Attached Storage (NAS) architectures and snapshot-based data protection with Data ONTAP.

AZURE FILES

Overview

Azure Files provides Azure-based file storage as a managed service that runs only in the Azure cloud to offer remote SMB access to file shares for Windows users and applications. Azure File Sync is a separate solution offered with Azure Files that adds the ability to cache copies of files from Azure Files on Windows File Servers. The Windows File Servers, whether in the cloud or at remote edge locations, can use Azure File Sync to provide multi-site file sharing with synchronization through an Azure Storage Sync Service.

Strengths

Azure Files may be a logical option for small organizations that are accustomed to Windows File Servers and have little need for the high-capacity file shares, advanced data protection, rapid ransomware recovery, and rapid disaster recovery features needed by most enterprises.

Considerations

Azure Files has a 100 TB volume limit, which perpetuates data silos for most enterprises and prevents the solution from being used for NAS and file server consolidation. Data protection is limited to 200 snapshots, which leaves file data exposed to ransomware, since recovery points may be spread too far apart to minimize data loss. Because multiple, separate products are needed for larger organizations and the Windows File Servers needed for edge caching require OS patching and management, Azure Files is an administrative challenge at best. Costs are relatively high for larger organizations, due to multiple licensing requirements, sizing limitations, and the manual processes required to keep the solution running safely and effectively.

Azure Files may be **a logical option for small organizations** whose users are accustomed to Windows File Servers.

AMAZON FSX FOR WINDOWS

Overview

Amazon FSx for Windows is a Windows File Server hosted in an AWS data center and offered as a managed service. It runs only in the AWS cloud to offer remote SMB access to file shares for Windows users and applications. For NFS file shares, the separate Amazon Elastic File System (EFS) is needed. Amazon FSx File Gateway is an optional add-on that provides the ability to cache copies of files from Amazon FSx for Windows on Windows File Servers. The Windows File Servers, whether in the cloud or at remote edge locations, rely on the gateway to provide multi-site file sharing with synchronization.

Strengths

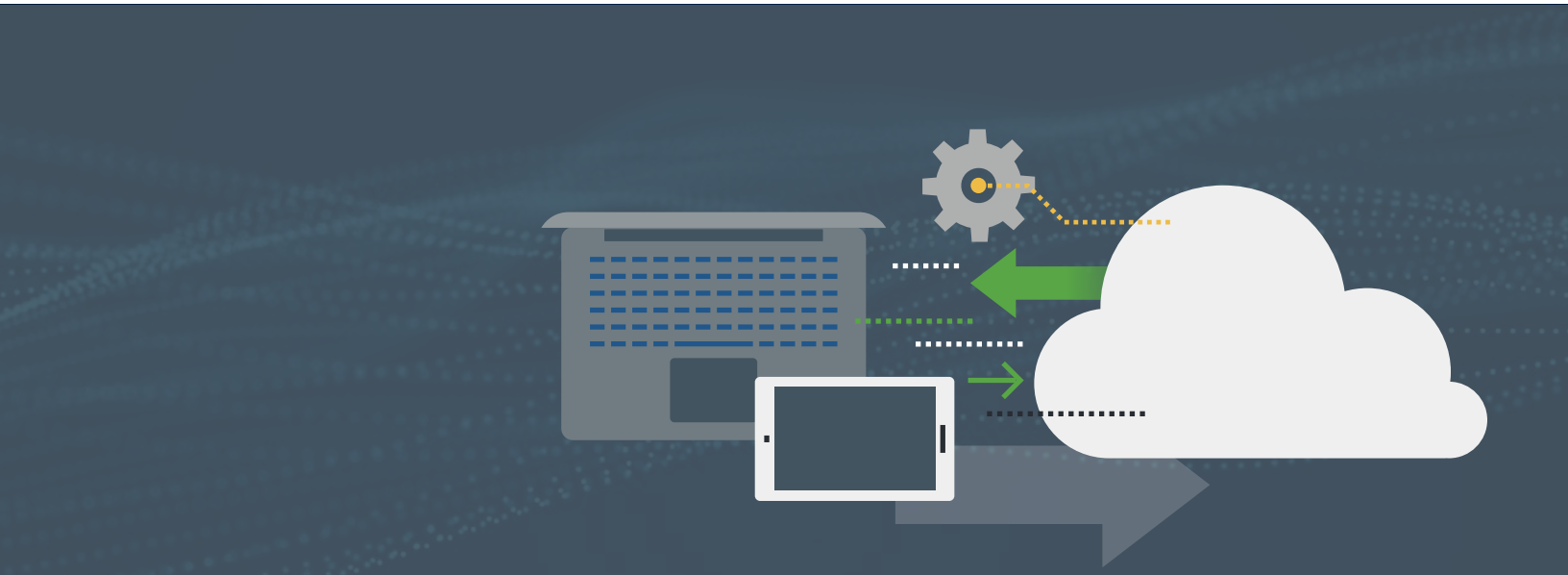
As with Azure Files, Amazon FSx for Windows may be suitable for small organizations that are accustomed to Windows File Servers and its limitations. Larger enterprises would need to be content with capacity constraints, drive mapping complexity, fewer recovery points, slower disaster recovery, and slower file synchronization.

Considerations

Amazon FSx for Windows has a 64 TB volume limit, which perpetuates data silos and prevents the solution from being used for NAS and File Server consolidation. Multiple, separate products must be deployed and managed to meet the needs of most enterprises, driving up costs and administrative complexity. Essentially a “lift and shift” cloud solution – virtualizing a Windows File Server, hosting it in the AWS cloud, and offering it as a managed service – it inherits all the limitations of an on-premises Windows File Server.

amazon FSx

Virtualizing a Windows File Server **inherits all the limitations of an on-premises** Windows File Server.



WINDOWS FILE SERVERS HOSTED IN THE CLOUD

Overview

A Windows File Server hosted in the cloud is suitable primarily for small organizations with limited data storage needs or cloud-based apps that need small capacity file shares with SMB protocol access. This approach is essentially the same as Amazon FSx for Windows, except instead of being packaged as a managed service by the cloud provider, it is a virtualized instance of a Windows File Server that is provisioned and managed by the customer, not the cloud provider, which may be preferred by some customers.

Strengths

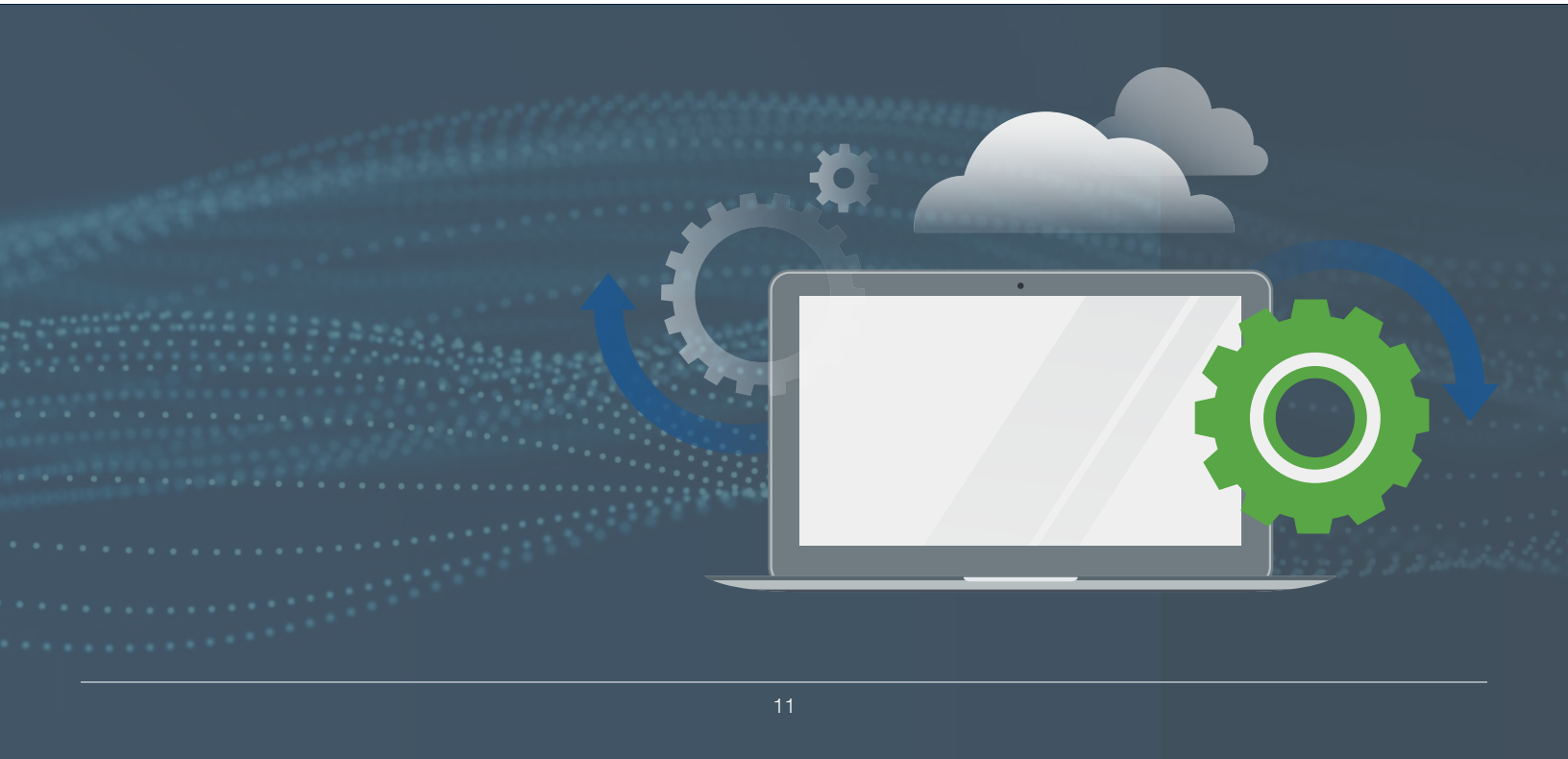
The same strengths apply to this option as Azure Files and Amazon FSx for Windows -- potentially suitable for small organizations with low expectations regarding file sharing capacity, speed of access, and features typically required by enterprises or even medium-sized organizations.

Considerations

Windows File Servers hosted in the cloud are no easier to manage than Windows File Servers on-premises. Extensive and regular manual tasks are required to provision, manage, and patch server VMs, OS instances, backup software, and storage, etc. Using Windows File Server compute becomes costly both to purchase and maintain. Many of the features found in other vendor options are not available, including deduplication and compression, edge caching, file synchronization, and global file locking.

Windows Server

The Windows File Server is **managed by the customer**, not a cloud service, which may be preferred by some customers.



NASUNI CLOUD FILE STORAGE

Overview

Nasuni is an object storage-based cloud file storage platform that combines traditional NAS and File Server capabilities with multi-site file synchronization, advanced data protection, and centralized management capabilities. Nasuni's UniFS® global file system can reside in AWS, Azure, Google Cloud, or on-premises object storage, but extend out to edge data centers, remote offices, and cloud regions using lightweight edge VMs that cache copies of only the frequently used file and reduces the on-premises footprint by up to 90%. Nasuni is offered as a subscription service.

Strengths

Traditional file backup is eliminated by continuously protecting every version of every file and storing each version forever in the cloud using a WORM model. Disaster recovery in all locations is addressed by having multiple copies of data and metadata stored in different regions by the cloud object storage providers. Multi-site file synchronization can process billions of file sync requests, and move exabytes of data between locations for each customer. Global file locking, also implemented as a redundant, scalable cloud service, enables users to work on the same files in multiple locations without version conflict. By scaling inside object storage instead of hardware controllers, the UniFS file system imposes no limits on the number or size of files, shares, volumes, or snapshots.

The Nasuni Management Console enables an entire enterprise file infrastructure to be managed through a single, web-based console. Edge appliances and shares can be provisioned, drives can be mapped, snapshots can be scheduled and individual files, file versions, entire shares, or entire volumes can be recovered. Health monitoring, reporting and REST APIs for external scripting and integrations with third party tools such as Syslog and Splunk are also included.

Nasuni's cost advantage comes from using object storage as the back-end repository for all files and metadata. Nasuni lets customers use the most inexpensive, cool tiers of object storage such as Azure Cool Blob, Amazon S3 Infrequent Access, or Google Cloud Archive Storage. Additional cost savings come from Nasuni Continuous File Versioning®, which eliminates the need for traditional file backup infrastructure; Nasuni Rapid Disaster Recovery gets customers running in approximately 15 minutes and eliminates the need for dedicated DR sites. Ransomware disasters are avoided with Nasuni's rapid recovery technology to get files back in production within minutes. Hardened Linux VMs at the edge, which eliminate the need for Windows Server OS and client access licenses and can be sized to fit the number of users or cached capacity needed at each site.

Considerations

While Nasuni can be deployed for personal 'home drives' it is more typically used for department, project, and organizational file shares, high-capacity archives, and VDI file storage. Nasuni is also not currently architected for High-Performance Computing requirements.

NASUNI.

The Nasuni Management Console **enables an entire enterprise file infrastructure** to be managed through a single, web-based console.

Want to learn more?

For a more detailed report on any of these vendors, please contact **Info@Nasuni.com**

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