

# Lab Validation Report



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### **ESG Lab Reports**

The goal of ESG Lab reports is to educate IT professionals about data center technology products for companies of all types and sizes. ESG Lab reports are not meant to replace the evaluation process that should be conducted before making purchasing decisions, but rather to provide insight into these emerging technologies. Our objective is to go over some of the more valuable feature/functions of products, show how they can be used to solve real customer problems and identify any areas needing improvement. ESG Lab's expert third-party perspective is based on our own hands-on testing as well as on interviews with customers who use these products in production environments. This ESG Lab report was sponsored by Nasuni.

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# Introduction

ESG Lab tested Nasuni with a focus on evaluating file data access and control, unlimited scalability, and built-in data protection and security.

#### Background

According to ESG research, by far the greatest storage challenges facing surveyed midmarket and enterprise organizations are the rapid growth and management of unstructured (file) data, data protection, and storage hardware costs (see Figure 1).<sup>1</sup> There is little doubt that these are not just isolated challenges, but actually work together to make life difficult for IT. The massive proliferation of endpoint devices like smartphones and tablets, in addition to laptops, means that knowledge workers are much more mobile, and able to both consume and create documents, audio, video, pictures, and other files quickly and easily. This is a boon to business agility, but delivering access to all this data at the performance levels users have come to expect is a complex and expensive undertaking.

Figure 1. Storage Challenges





Primary storage challenge All Storage Challenges

Source: Enterprise Strategy Group, 2015.

With traditional storage, hardware costs can become a huge burden in a growing environment, and so can both managing and protecting your data across more and more arrays. Adding to the burden, silos of backup, archiving, and disaster recovery infrastructure must be deployed and managed.

<sup>&</sup>lt;sup>1</sup> Source: ESG Research Report, 2012 Storage Market Survey, November 2012.

#### Nasuni: Cloud NAS for the Distributed Enterprise

Nasuni offers an integrated network attached storage (NAS) service to store and synchronize files across multiple geographic locations. Nasuni combines cloud services with high-performance hardware appliances to meet the demands of unstructured data in the enterprise. It offers a stable, scalable file system that can be globally distributed. Nasuni increases an organization's operational efficiency by streamlining the infrastructure required to manage unstructured data at scale. It gives an organization complete control of its files regardless of geographic location, workload requirements, or even mobile device type.

The solution uses on-premises Nasuni Filers that are back-ended by public cloud storage providers such as Azure. Nasuni provides instant access to data from any location. Stringent access controls and security enable all locations to have read-write access, so distributed teams can work from the same set of shared data. Changes made at one location guickly appear at others. Data security, automatic backup, and offsite replication are built in, and the cloud provides unlimited scalability to handle data growth. Nasuni offers a service level agreement based on its ability to treat the cloud as a component of its system. The company continuously monitors the system and cloud storage providers and can proactively address issues that arise. Customers lease the hardware and pay for services monthly, with Nasuni consolidating the billing from public cloud providers.

Figure 2 provides an architectural overview of a Nasuni deployment. On the left are the Nasuni Filer, sync and share, and mobile applications, which provide access to the globally shared pool of data volumes. Data is presented to users with industry-standard protocols that support both NAS and SAN workloads.<sup>2</sup> (This is different from other cloud solutions that extend their onsite file systems to the cloud and connect to their data using APIs.) Data volumes are stored in the cloud-based **UniFS** file system, along with redundant copies of every file and snapshot. Administrators can centrally manage the entire deployment (regardless of the number of locations) with the Nasuni Management Console. Individual Filers can also be managed using a role-based individual console, and the 24 x 7 Nasuni Network Operations Center provides monitoring, management, and proactive support.



Figure 2. Nasuni Service Overview

Nasuni Management Console

<sup>&</sup>lt;sup>2</sup> Nasuni supports the CIFS/SMB, NFS, FTP/SFTP, iSCSI, and HTTPS protocols.

Nasuni delivers enterprise-class data services while shifting the burden of storage provisioning and management to service providers. Nasuni benefits include:

- **Multi-site access**. The Nasuni architecture allows multiple Filers at multiple locations to access the same live volume. A gold data copy with a single version history is stored in the cloud and can be shared by any Nasuni Filer. Each Filer accesses the same single snapshot stream and can rollback to any point in time, regardless of where the data was created. All versions are saved as individual, unchangeable units that remain available and navigable for rollback, and all locations get local storage performance and immediate access.
- **Centralized control**. The Nasuni Management Console provides a single pane of glass for IT administrators to manage their globally distributed deployments, including Filer management, volume management, and system monitoring.
- Security. Data is encrypted on-premises with AES-256 encryption and remains encrypted in transit and at rest in the cloud. This military-grade encryption is the highest level of security available, and ensures that data is accessible and readable only by those with access privileges.<sup>3</sup> Key creation and management resides with the end-user, so neither Nasuni nor the cloud provider can view data.
- **Scalability**. Nasuni provides true capacity on demand and unlimited scalability. When users request additional storage, Nasuni simply upgrades the license and more capacity is immediately available. This enables organizations to grow organically in step with business needs, keeping budgets on track and eliminating costly upfront provisioning.
- Data protection. Data protection is automatic and built into the Nasuni service. The Nasuni Filer makes an unlimited number of continuous data snapshots, eliminating the need for additional data protection stacks. No backup or replication software is needed, no duplicate servers or storage have to be purchased and managed, and no secondary corporate locations are required. File-level restores are instantaneous and can be done with simple navigation. All data is protected in the cloud, where it is automatically replicated with three copies in three locations. For disaster recovery, complete access to all files can be restored within 15 minutes, which is the time is takes to download a virtual appliance, configure the LAN, and provide the license and encryption keys.
- **Desktop and mobile file synchronization.** A user can enable a folder on her desktop for local files that will not only be synced back to the Nasuni service, but also be available to that user's laptop and iOS/Android mobile devices.
- **Global File Locking.** Nasuni's Global File locking is incorporated into the cloud-based service, eliminating the failures or bottlenecks that hardware controllers can experience. It was designed to simplify and speed collaboration efforts for advanced computer-aided design (CAD) and building information modeling (BIM) files as well as other applications such as standard business documents.
- **Ease of deployment**. Nasuni Filer installation and volume creation are simple tasks. Shares can be connected to clients at other locations through the Nasuni Management Console.
- Service level agreement. Nasuni offers the most stringent SLAs in the industry, including 100% availability, accessibility, security, and immutability of data. Its guarantee includes penalties should Nasuni fail to deliver.

<sup>&</sup>lt;sup>3</sup> To prove its point, Nasuni challenged hackers to access information it had placed in the cloud for a \$5,000 reward. When they were (as expected) unable to do so, Nasuni donated the reward to an open source organization.

# **ESG Lab Validation**

ESG Lab performed hands-on evaluation and testing of Nasuni storage solutions at Nasuni's Natick, MA headquarters and offsite using virtual Filers. Initial testing was completed in November 2011, with updated testing in December 2014. Testing was designed to demonstrate enterprise-class access and control, unlimited scalability, and built-in protection and security. Global file locking and mobile file synchronization were of particular interest.

#### Access and Control for the Global Enterprise

ESG Lab began by exploring a headquarters-based Nasuni implementation that included three virtual Nasuni Filers with multiple volumes and files. First, the Lab explored the browser-based Nasuni Management Console, whose storage-management and system-monitoring tools enable IT to monitor system health and manage Filers and volumes for every location in the deployment, all from a single location. Data volumes and metadata are stored in the cloud, so no local hardware access is needed. This enables administrators to manage the data, not the storage.

Figure 3 shows the primary dashboard of the Nasuni Management Console. On the left is a summary of system health, indicating account subscription details; Filer, volume, and firmware status; and antivirus and sync error status. The top ribbon displays details of the seven volumes and three Filers under management in this deployment, as well as storage capacity, including both total gigabytes and percentage of licensed capacity (in this small example case: 199GB total, consuming 3% of the 5TB licensed). Also included is the amount of new data in the Filer cache that has not yet been protected with snapshots. Details of recent migrations are also listed.

The bulk of the dashboard provides graphic details of the deployment, aggregated from tabs in the console and configurable by the administrator. At a glance, administrators can view statistics such as data growth, network traffic, and what file types and sizes are being written.



Figure 3. Nasuni Management Console

Tabs enable drill down on volumes, Filers, the Nasuni account, and console settings. The top of Figure 4 displays the Volumes tab in our test environment, showing details for seven volumes, 47 storage access points (CIFS, NFS, FTP, and iSCSI), and 18 HTTPS access points (both web and mobile). From this tab, administrators can create, connect, and configure volumes and volume services; configure access points; define remote access permissions; manage

snapshot frequency and retention; set quotas; and monitor volume health. When a volume is created, the administrator selects the region in which the volume and its copies will be stored; availability zones within regions ensure replication with geographic protection, while maintaining in-country compliance when required. Overview charts are displayed at the top and full volume details are listed below. Settings can be applied to multiple volumes from prebuilt templates to simplify management.

The bottom of Figure 4 shows the Filer tab. The test environment included three Filers and four connected clients. From this tab, administrators can monitor system health and manage updates, cache and protocol settings, encryption keys, QoS, and Filer services such as migrations, licenses, support, and diagnostics. High-level charts are displayed at the top and Filer details at the bottom. Templates and rules can be applied to groups of Filers, and Filers that are offline are automatically updated when they come back online.



#### Figure 4. Nasuni Management Console: Filer and Volume Tabs

#### **Desktop File Synchronization**

Nasuni includes Desktop (and Laptop) File Synchronization, enabling file sync and share capabilities across devices. This enables users to select a folder on their desktops in which to store files that will be both synchronized with Nasuni (where they will also be snapshot protected) and available to other employee devices such as laptops, smartphones, and tablets.

ESG Lab tested a desktop with the Nasuni Desktop Client already installed and connections established between Filer and Client. After logging into the Filer, we added and deleted files and observed them syncing with both Windows and Macintosh clients. As the screenshot at the top of Figure 5 shows, the Preferences tab enables users to select one-way or bidirectional syncing, as well as setting file type exclusions, sync frequency, maximum disk usage, and instant upload capability. The Sync Me folder was used for syncing with the user's home directory; the screenshot at the bottom of Figure 5 shows the Sync Me and Home Directory folders, containing identical file data.

#### Figure 5. Desktop File Synchronization



#### Mobile Device and Web Access

Nasuni offers native Apple iOS and Android mobile device applications for access to file data, as well as browserbased access. This enables users to access their data securely from laptops, smartphones, and tablets. Links to files can be shared internally, and users can self-restore previous file versions.

ESG Lab tested these features with a home directory on a Nasuni Filer, which we accessed from both an Android phone with the application already installed, and from an iPhone 6 after downloading the mobile application from the app store. Figure 6 shows the same files on the iPhone and on a web browser.



#### **Global File Locking**

The Nasuni solution has always supported conflict management; when multiple users edit the same document at the same time, each user's changes are saved on the local Filer. For many organizations, this is sufficient, but for applications such as CAD and BIM used by architecture, engineering, and construction (AEC) firms, multiple users often need editing capability in the same project at the same time.

For these true collaboration needs, Nasuni has added Global File Locking in a way that leverages Nasuni's cloud architecture. Most solutions centralize the locking function with a lock server that becomes not only a bottleneck, but also a single point of failure. If that server fails, so does your locking capability.

Instead, Nasuni has taken the protocol-level locks that are required for locking application data and moved them into Nasuni in the cloud. This enables locking across all Filers in a deployment regardless of their location. In addition, should a lock be intentionally broken by an administrator, the standard Nasuni conflict management routine kicks back in, eliminating the chance of losing changes. Cloud-based lock servers handle lock management and scale automatically as needed (see Figure 7). Nasuni Volumes can be configured for locking at the folder level through the Nasuni Management Console.



#### Revit Testing

Nasuni Version 6.2 includes Global File Locking enhanced specifically for Revit Worksharing, a key part of Autodesk's Revit BIM software, in which multiple users access the same plan or design. The need for strict adherence to change management procedures with building plans typically requires long wait times as users synchronize elements and open files across the WAN. Simply using Nasuni and local Filers gives organizations LAN-like performance to speed file sharing. The addition of enhanced file locking enables these organizations to eliminate the costly and complex Revit Server, and still safely collaborate and share access to models and drawings across globally distributed locations and devices. In addition, it enables users to return to best-practice synchronization procedures that are sometimes otherwise abandoned in the name of productivity.

ESG Lab testing leveraged a construction project plan, which might be accessed by multiple construction, electrical, and plumbing contractors simultaneously, but must be up to date at all times. In our testing, Client 1 owned the second floor plan, and *forest1\_user\_admin* wanted to move an individual element within the plan: a wall. The attempt to move the wall elicited an error message indicating that the element could not be moved until it has been *Saved to Central* (Revit's version control schema) and reloaded (see Figure 8, #1). ESG Lab clicked on the **Place Request** button, and an editing request message was sent to Client 1 (see Figure 8 # 2). Once Client 1 granted the

request, a notification was sent to Client 2's screen. We then moved the wall in the floor plan and, when prompted, executed a *Synchronize with Central* task. The Active Workset details page was updated to indicate that *forest1\_user\_admin* had borrowed Workset1 (see Figure 8, #3). Finally, we reviewed the list of Revit file locks on the Nasuni Management Console screen for that Filer (see Figure 8, #4).



#### Figure 8. Revit with Nasuni Global File Locking

ESG Lab also validated the Global File Locking feature using MS Word documents on two Windows 7 VMs. In addition, we validated the ability to break locks using the Nasuni Management Console, such as when a user leaves for the night with the document open and the lock on.

## Why This Matters

In ESG research with IT professionals, managing data growth is consistently seen in the top four most-cited IT spending priorities.<sup>4</sup> At the same time, today's mobility and collaboration efforts require that organizations increasingly focus on making data more accessible across locations and devices. Providing fast access to file data from any device or location, with proper levels of protection and availability, becomes both difficult and expensive as organizations and data volumes grow. Managing more than a few NAS devices by tracking IP addresses, snapshot schedules, etc. on spreadsheets becomes an overwhelming and error-prone task.

ESG Lab validated the ability of the Nasuni Management Console to efficiently manage (not just monitor) deployments of any size, enabling organizations to scale beyond the local resources and hardware. The Lab also validated mobile device access, web access, and Desktop File Synchronization, which adds a key capability that users demand while enabling IT to maintain control and management.

Finally, ESG Lab validated Global File Locking with both standard business documents and the Revit BIM application. This critical capability for global collaboration is not simple to incorporate, and ESG Lab was extremely impressed with the level of functionality and integration with a key industry application.

<sup>&</sup>lt;sup>4</sup> Source: ESG Research Report, <u>2015 IT Spending Intentions Report</u>, February 2015.

#### Infinitely Scalable, Bottomless Cloud Storage

While cloud storage is designed for unlimited scalability, traditional NAS systems are not. There is a limit to the number of files that can be managed per NAS system and per file system, as well as limits on capacity, performance, and throughput. In addition, files are tied to specific hardware devices, and file systems or global name spaces locate files and access them directly. IT must manage clustered hardware and/or file systems to scale, and create replicas to move the data closer to users for better performance; and then these replicas must be kept up to date.

Nasuni provides customers with a bottomless pool of cloud storage that scales by simply upgrading the service license. This enables organizations to start with only the capacity they actually need, instead of overprovisioning (with increased cost and complexity) to avoid a future upgrade. Organizations can add locations and still provide fast access to data stored centrally in the cloud, and they can increase performance without disruption.

Nasuni's UniFS is a global file system that maintains a single master copy of data in the cloud and distributes data access as it is needed. UniFS essentially virtualizes files, separating them from hardware, and provides cached local access for performance. This delivers infinite scalability without performance degradation. Capacity is elastic, and there is no limit on files sizes, volumes, numbers of files or directories in a volume, or snapshots. The intuitive GUI makes adding users, volumes, and locations a simple process, enabling organizations to grow organically as they need and scale their storage deployment along the way.

#### ESG Lab Testing

Nasuni uses the disk and memory resources in the local Filer to accelerate access to shared and protected storage. The lightweight HTTPS protocol, deduplication, compression, and encryption are used to quickly and securely send unique data to the cloud.

ESG Lab verified Nasuni's ability to provide enterprise-class performance by creating a geographically distributed, multi-site test bed and testing the user experience with commonly used file types. Using Nasuni Filers in Milford MA and Dallas TX, a test bed was populated with a large amount of data including video, audio, and common office productivity files. The file systems were then shared between each location. A PDF file copied to a shared directory in Milford was instantly available in the Dallas directory listing. A mouse click on the file from Windows Explorer launched the Adobe PDF viewer. Just like accessing a PDF file on a local hard drive, the initialization of the PDF viewer software was the longest part of the process. Testing with text files, Word documents, and MP3 files resulted in a similar user experience: Files were securely accessed from the cloud, loaded quickly, and felt like they were stored on a local hard drive.

Figure 9 shows a graphical representation of the performance benefit of Nasuni storage versus traditional NAS storage in a WAN-based environment. The top of Figure 9 shows the chatty, protocol-heavy challenge of sending CIFS or NFS data across a WAN connection. These protocols require a large number of acknowledgements at each end of the network to move a packet of data, which increases wait time and introduces latency. As a result, organizations that rely on fast access to shared files often incur the cost and complexity of deploying and maintaining WAN optimization appliances in the data center and at remote locations.

In contrast, the Nasuni approach is shown at the bottom of Figure 9. With Nasuni, the lightweight HTTPS protocol and deduplication were used to send compressed, unique changes over the WAN. Nasuni caching and WAN-efficient HTTP increases performance as it dramatically reduces WAN bandwidth requirements.





#### Flexible, Scalable Nasuni Filers

Nasuni enables flexibility of deployment with local caching devices for local performance. This starts with a virtual Filer that customers configure on their own with Nasuni-recommended specs. Physical Nasuni Filers range from the small NF-50 desktop model up to the large NF-440. Performance scales as you upgrade the Filer, starting at about 1,038 IOPS for the virtual Filer on a minimum hardware configuration, up to systems that carry 1,000+ user workloads with much higher IOPS. Figure 10 shows relative IOPS performance results for each Filer as tested by Nasuni using version 6.0. Upgrading Filers is a non-disruptive event; data remains in the cloud, so there is no data movement, and organizations can easily upgrade without interrupting data services.



Table 1 provides an overview of Filer specs, with a key metric being the number of users that each model supports. A properly configured virtual Filer can support up to 50 users, while the NF-50 desktop model supports up to 30 users with 2TB-6TB of cache and 8GB of RAM. Rack-mount Filers range from 2TB-22TB of cache; up to 32GB of RAM; single or dual Intel Xeon, multi-core processors; and support from 50-300 users. While factors such as file types and sizes, applications, snapshot frequency, bandwidth availability, and level of usage should all be considered when sizing a Nasuni Filer, Table 1 outlines key specifications as a guideline.

#### Table 1. Nasuni Filer Specifications

Filer Models	Cache	RAM	CPU	Number of Users
VM	Recommend 64GB-2TB in VMDK or VHD	Recommend 4GB minimum per VM	Recommend 2 cores	Up to 50
NF-50 (desktop)	2TB-6TB	8GB	Intel C2558 2.4GHz, 4-core	Up to 30
NF-100	2ТВ	8GB	Intel Xeon E5-2403 1.8GHz, 4-core	Up to 100
NF-200	бТВ	16GB	Intel Xeon E5-2440 2.4GHz, 6-core	50- 125
NF-400	бТВ	32GB	Intel Xeon E5-2620 2.0GHz, 6-core	100-300
NF-440	11TB-22TB	32GB	Dual Intel Xeon E5-2620 2.0GHz, 6-core	200+

#### **Cloud-scale Proof Points**

A good way to evaluate scalability is by looking at what customers have been able to accomplish with their Nasuni deployments. These examples (and Figure 11) demonstrate how Nasuni enables cloud scale in locations, files, and performance:

- One of the world's largest public relations firms, with more than 10,000 clients, was struggling with large and growing media files. Its Nasuni deployment provides scale-out storage, file access, and data protection to its more than 5,000 employees in 68 offices around the globe.
- One of the largest architectural firms in the world needed to keep architectural plans in sync and accessible to all employees. The company's Nasuni service delivers global file access, backup, and disaster recovery for 1,500 employees in 25 offices around the globe.
- Nasuni created a single volume within a UniFS file system in the Nasuni Service, containing more than 1 *billion* files with more than 27,000 versions of the file system saved as snapshots, all accessible from any connected Filer. Four Nasuni Filers (virtual and physical) in different locations wrote to that volume for 15 months until it surpassed 1 billion files.



Figure 11. Nasuni's Cloud Scale



## Why This Matters

Traditional NAS solutions require strategies like clustering and data replication to deliver scalable storage that provides file access to multiple locations and meets performance requirements. These increase the costs of both equipment and management.

Nasuni leverages cloud storage plus the UniFS Global File System to ensure that organizations can grow simply and easily while maintaining access and performance regardless of location.

ESG Lab validated enterprise-class performance by sharing large amounts of video, audio, and office productivity files between locations. ESG Lab also reviewed IOPS results and Filer specs that demonstrate the scalable range of solutions, as well as cloud-scale proof points.

#### **Built-in Protection and Security**

Data protection and disaster recovery are built into the Nasuni service. Continuous, unlimited snapshots provide restore points that any location can leverage, and geo-replicated copies are automatically propagated for every file and snapshot. With the primary data copy in the cloud, disaster recovery can be as simple as starting up a VM, downloading Filer software, and providing license and encryption keys.

Nasuni uses highly secure OpenPGP key management with AES-256 encryption to encrypt data before it leaves the Filer and decrypt it when it is read back. Data is never unencrypted outside of the customer site, and is not readable by the cloud provider or Nasuni. Additional security procedures include random session keys that prevent hackers from detecting patterns and reverse-engineering encryption keys, plus SSL-protected, end-to-end data transmission that would identify any attempt to interfere.

#### ESG Lab Testing

ESG Lab audited the OpenPGP encryption methods that are used to ensure that data stored in a Nasuni Filer is encrypted in transit and at rest. The contents of an Amazon bucket used to store Nasuni Filer data during the ESG Lab validation were examined. The contents of an encrypted and compressed chunk of a file are shown in Figure 12.

ESG Lab confirmed that the files were encrypted and compressed locally on a Nasuni Filer before being sent over the WAN and stored in the cloud. Security is ensured as data is encrypted in transit and at rest, confirming Nasuni's guarantee that files in Nasuni are 100% secure.



ESG Lab noted that the default key management policy is for an organization to manage its own encryption keys. This ensures that no one outside of the organization can gain unauthorized access to data, including the cloud provider and Nasuni personnel.

#### File Recovery

Nasuni snapshots are used for data protection. They are easy to access: Because files and snapshots are saved in an object storage pool, there is no wading through the file system to find what you want.

ESG Lab tested user self-recovery using a virtual Filer. After creating a volume called **ESGLabVol1**, we created a Microsoft Word document called *Nasuni Test Doc.docx* with a timestamp of 5:08 pm, uploaded it to the Filer, and manually executed a snapshot. Once the snapshot was complete, the status of the document changed from "pending" to "protected." Next, we edited the document to say "This is version 2" with a timestamp of 5:12 pm, saved it, and took a snapshot. We repeated this process with version 3, with a timestamp of 5:14 pm.

The File System Browser displays the current file system and enables rollback to any day and time. This single timeline displays each snapshot and maintains data changes over time; you get a list of snapshots and can then restore on the file or folder level, anywhere on the network. After clicking the Current Versions drop-down menu, we could see various versions of the file system listed by timestamp; these are highlighted in red in the screenshot at the top of Figure 13. Next, we scrolled back to the 5:08 pm version, selected the document, and clicked on **Restore File**. A dialog box (bottom of Figure 13) informed us that that this would return the selected object to the current version. In addition, we clicked in the **Backup Existing** box, so that a backup with a revised file name would be created for the file with the same name that already existed. Once the file had been restored, we opened it and confirmed that it was the Version 1 document.



#### Disaster Recovery

Finally, ESG Lab confirmed the ability to quickly perform disaster recovery with Nasuni. Because all files are protected in the cloud, recovering from a disaster is performed by simply reinstalling Nasuni Filer software on a physical or virtual server and connecting it to the cloud volume. ESG Lab used the disaster recovery wizard to

recreate an ESG Filer on a VMware virtual machine. The process was similar to that of a new install, completely wizard-driven and, with the exception of providing the necessary encryption key, consisted mostly of confirmation and warning screens designed to protect against overwriting an existing Filer. Less than ten minutes after getting started, files were being accessed from the cloud on a freshly deployed Nasuni Filer.

# Why This Matters

Traditional storage deployments require separate infrastructure stacks for backup and disaster recovery increasing costs, demanding downtime, and requiring management for every different location. Cloud storage can provide tremendous cost savings on both infrastructure and management, but some organizations are wary of data security in the cloud. Security and data protection concerns were the top two most-cited factors preventing respondents to previously conducted ESG research from either adopting public cloud services or expanding their usage.<sup>5</sup>

Nasuni keeps cloud data fully protected and secure while simplifying and even eliminating typical data protection hardware, software, and processes.

ESG Lab tested the Nasuni enterprise-grade encryption and was able only to view encrypted characters. We validated the simplicity of user self-recovery of a file from a snapshot. ESG Lab also tested the disaster recovery process by bringing up a new VM and restoring access to a multi-site, shared volume with a just a few clicks, in less than ten minutes.

<sup>&</sup>lt;sup>5</sup> Source: ESG Research Report, <u>2013 Public Cloud Computing Trends</u>, March 2013.

# **ESG Lab Validation Highlights**

- ☑ ESG Lab confirmed that Global File Locking can be used to avoid mistakes and data corruption when multiple users are sharing the same file from the same, or different, locations around the globe. A simple Microsoft Word test confirmed that two users trying to make changes to the same document were notified when locks were preventing accidental overwrites. An advanced locking test was performed with AutoCAD and Autodesk Revit software, which has a rich set of locking semantics that enables multiple designers to work on the same project from multiple locations around the world.
- ☑ ESG Lab managed a multi-site environment from a single pane of glass and confirmed that the Nasuni Management Console not only makes it easy to add and monitor additional sites, users, and capacity, but also includes tools for migrating data into the environment and setting up data protection policies based on the infinite snapshot capabilities of the Nasuni UniFS Global File System. ESG Lab was also pleased to see QoS settings included in the interface to help manage bandwidth utilization.
- ESG Lab confirmed that sync and share functionality makes it easy to collaborate on and share files from a desktop or laptop. Once the sync and share policy was setup, the Nasuni Global File System provided secure data protection and recovery.
- ESG Lab tested mobile access with Apple iOS and Google Android apps that make it easy to access globally shared and protected files from your favorite mobile device.
- ☑ ESG Lab validated the ability to simply deploy physical and virtual Nasuni Filers in less than 20 minutes. Installing and configuring a multi-site solution using the VMware OVF template, the Microsoft Hyper-V image package, and a factory-configured Nasuni appliance was easy.
- ESG Lab tested the performance capabilities of the solution by setting up a multi-site test environment, configuring Filers in Dallas, TX, Milford, MA, and the Nasuni corporate facility in Natick, MA. We confirmed that file access had the real-world feel of local data access regardless of where the users were located. In most cases, data was available in less time than it took to launch the application accessing it (e.g., Microsoft PowerPoint, Microsoft Word, and Adobe Reader). ESG Lab was instantly able to stream an audio file at the remote sites and hear the music over a conference call during validation testing.

# **Issues to Consider**

- ☑ The Global File Locking feature that was added since the 2012 ESG Lab Validation is an impressive achievement. There is overhead for this feature that can reduce the number of users that can be effectively served by a Filer, but because it can be configured only for directories that require true collaboration, organizations can limit the impact. In addition, should organizations need to upgrade to a larger Filer, this process requires no data migration and can be completed in 15 minutes.
- ☑ The addition of Desktop File Synchronization enables users to sync internally on their devices. External sharing currently requires prior set up; the addition of links that could be sent to external users along with access codes for data protection would improve sharing capabilities.
- ☑ The Nasuni code has some heuristics built in; for example, the pre-fetch algorithm can identify sequential versus random file types and only execute pre-fetch where it is useful, for sequential file types. This kind of data awareness in storage is gaining popularity as organizations are beginning to recognize that content is not the only valuable part of their data. Storage metadata can provide additional organizational detail that can be used to organizations' advantage, particularly by simplifying compliance and governance efforts. Nasuni may have a head start on the competition based on these built-in heuristics that accompany an already enterprise-class set of storage features and services.

# The Bigger Truth

The biggest challenge most organizations face with file data is continual, exponential growth. The cloud can provide infinite storage on demand and geographic replication, so, as a component of your storage infrastructure, it helps you manage growth and pay as you grow instead of paying upfront. Nasuni does that leveraging public cloud providers.

Using the cloud for storage is a great premise, but it's not without challenges, the most critical being data security. From the moment your file is created, it must be encrypted and secure if it's not living inside your firewall. Nasuni does that too, with military-grade encryption in transit and at rest and with customer-managed keys.

And then there is performance—accessing data over the WAN is not optimal. Nasuni handles that with an onsite cache of the most frequently used data so you get local performance no matter where you are. Then there's data protection—geo-replication is a great start, but it's only good for disaster recovery. Organizations are much more likely to need operational recovery after a file corruption or accidental deletion, and Nasuni solves that with unlimited snapshots for instant rollback.

The next challenges? Supporting the mobile workforce and enabling global collaboration are essential in today's business landscape. The addition of desktop file synchronization and global locking expand the collaborative value of the Nasuni Service. The former enables users to share, access, and synchronize files from multiple devices, yet with a service that is *within IT control* instead of out of sight, while the latter ensures critical change control in CAD/BIM applications like Revit *without impeding productivity*.

Nasuni was born in the cloud, and was built for cloud scale from the beginning. It was designed to optimize data access and performance for users, with both scalability and protection as essential, built-in services. The key architectural difference of a cloud-built storage solution is that data is not bound to hardware, so sharing and managing are significantly simpler. This means that users gain global file access to better work together, and IT gains the ability to manage 100% of its file storage from a single console, with complete assurance that the data is protected. And all of this with a single annual check!

With Nasuni, customers make data management decisions instead of infrastructure decisions. The key questions to answer are: Who needs access to what data? Where do they need it? What level of performance do they need? How much change control do they need? These are questions about the customer's business and how her file data is being used, and these are the questions that should drive infrastructure decisions.

ESG Lab testing validated the accessibility of data, ease of IT control, cloud scalability, and complete data security and protection of the Nasuni Service. ESG Lab was particularly impressed with the advanced functionality, ease of integration, and simply elegant cloud-based design of the recently released Nasuni Global File Locking feature. Locking that works transparently and quickly with existing applications and workflows as it provides the truly global ability to share files without worrying about conflicts and overwrites is an impressive accomplishment. The potential savings within distributed enterprises with data-rich workflows is even more impressive.

This is the next generation of enterprise storage for the distributed enterprise—and not a moment too soon. Like the younger generation that was raised on interactive media, cell phones, and texting, today's business user is impatient. IT resources are viewed as services for users to leverage, just like their office telephones. You wouldn't expect to wait for phone service—nor would you be expected to predict how much you would talk on the phone in the next year so IT could adequately plan and execute service delivery. The same goes for computing and storage services today—waiting and predicting are in the past, and services are the way of the future. ESG Lab has confirmed that Nasuni delivers primary storage from the cloud with enterprise-level performance, security, and protection—customers just get to consume them.



# Appendix

Table 2. ESG Lab Test Bed

Nasuni Filers	VM, NF-50, NF-200, NF-400
Nasuni Software	Nasuni Service 6.2
Clients	Windows, OS X, iOS, Android, Linux
Computer Aided Design/Collaboration	AutoCAD/Autodesk Revit



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