

ESG Lab Review

Nexsan Assureon – Secure, Online Disk Storage Archive

Date: May 2010 **Authors:** Mark Peters, Senior Analyst, and Tony Palmer, Senior ESG Lab Engineer

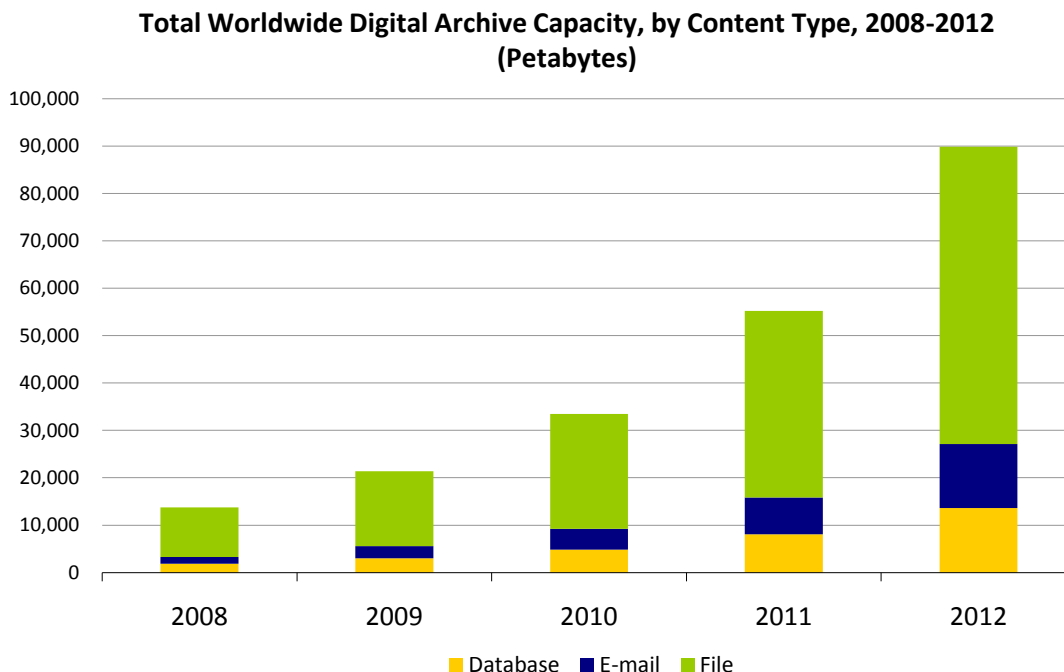
Abstract: Driven by a mix of increased regulation, business expectations, and the sheer growth of data, digital archives are not only growing in capacity, but also in the number of individual objects that are being stored and managed. Nexsan's Assureon is a CAS (Content Addressable Storage) system capable of protecting, retaining, and searching millions of files; it is designed to be a simple, yet secure, plug-and-play solution for businesses of all sizes.

Online Digital Archiving, the Market Backdrop

Challenges, Realities, and why Archive?

ESG estimates that organizations will retain nearly 63,000 petabytes of unstructured data in digital archives over the next three years in order to meet litigation and regulatory mandates (e.g., Federal Rules of Civil Procedure (FRCP), SOX, HIPAA, GLBA, and PCI DSS) and to support business intelligence initiatives.¹ To put this in perspective, it was only in 2009, that Eric Schmidt, Google's CEO, estimated the total capacity of data on the internet at 5,000 petabytes.²

Figure 1. Total Worldwide Archived Capacity, by Content Type (Petabytes)



¹ Source: ESG Research Report, [File Archiving Survey](#), December 2007. All ESG research statistics come from this report unless otherwise cited.

² Chang, Fay Dean, Jeffrey Ghemawat, Sanjay Hsieh, Wilson C. Wallach, Deborah A. Burroughs, Mike Tushar, Chandra Fikes, Andrew and Gruber Robert E. "Bigtable: A Distributed Storage System for Structured Data", 2006, Retrieved from <http://labs.google.com/papers/bigtable.html> on 10/7/2008

The goal of ESG Lab reports is to educate IT professionals about emerging technologies and products in the storage, data management and information security industries. 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 Nexsan.

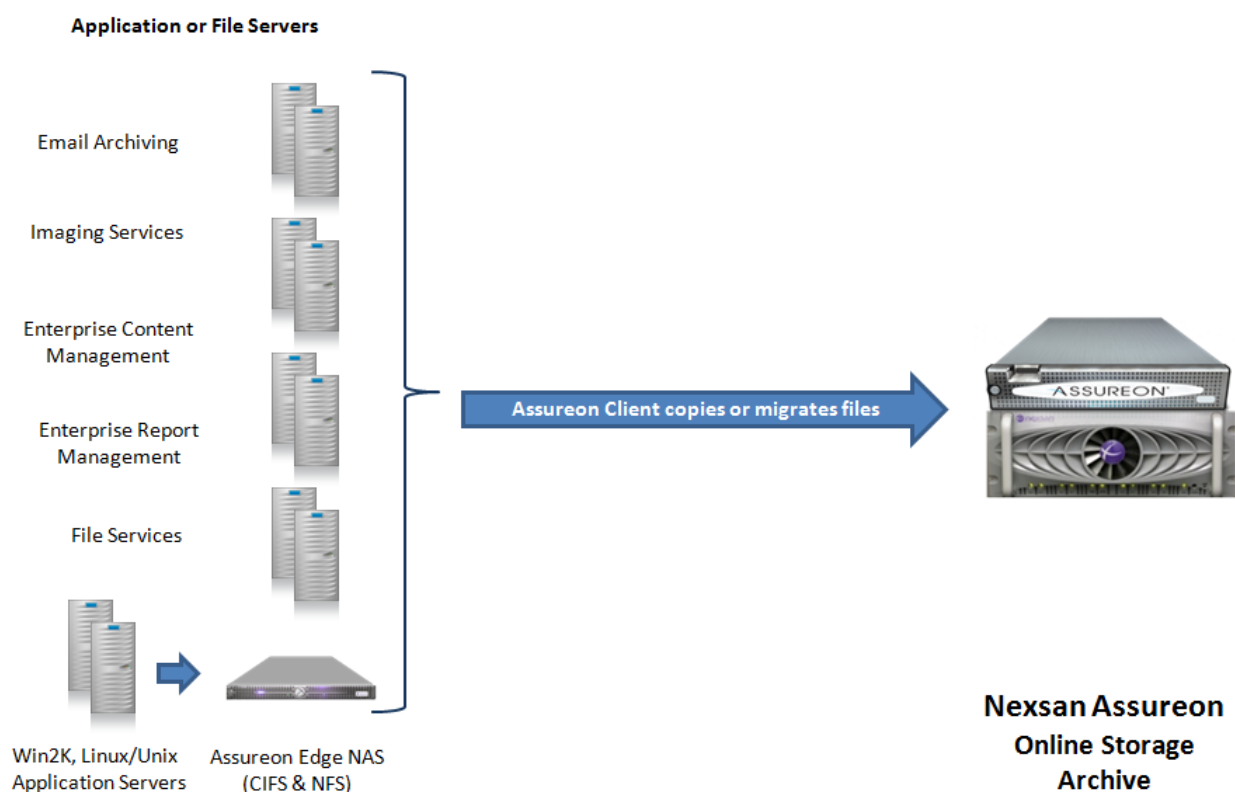
ESG research indicates that the vast majority of corporate digital assets are stored as unstructured data. Unstructured file data—which includes office documents, digital images, audio, and video files—accounted for 74% of global digital archive capacity in 2009 and is expected to constitute the bulk of digital assets for the foreseeable future. Growing at a compound annual rate of 79%, the worldwide capacity for file-based unstructured archive data clearly dwarfs that of database and e-mail data, as shown in Figure 1. The situation cries out for organization, management, and easy access.

It's no surprise then that the majority of organizations recognize the need for file-based archiving solutions: 65% of organizations surveyed by ESG currently have some form of formal process and/or technology in place to manage the archiving of file-based content. An additional 29% of organizations surveyed expect to deploy file archiving solutions over the next few years. In the same survey, improved search, performance, and security were high on customers' archive solution wish-lists. Indeed, full content index and search is the number one "must have" feature among current and prospective customers of archiving solutions.

Nexsan's Assureon: Secure, Online Archive

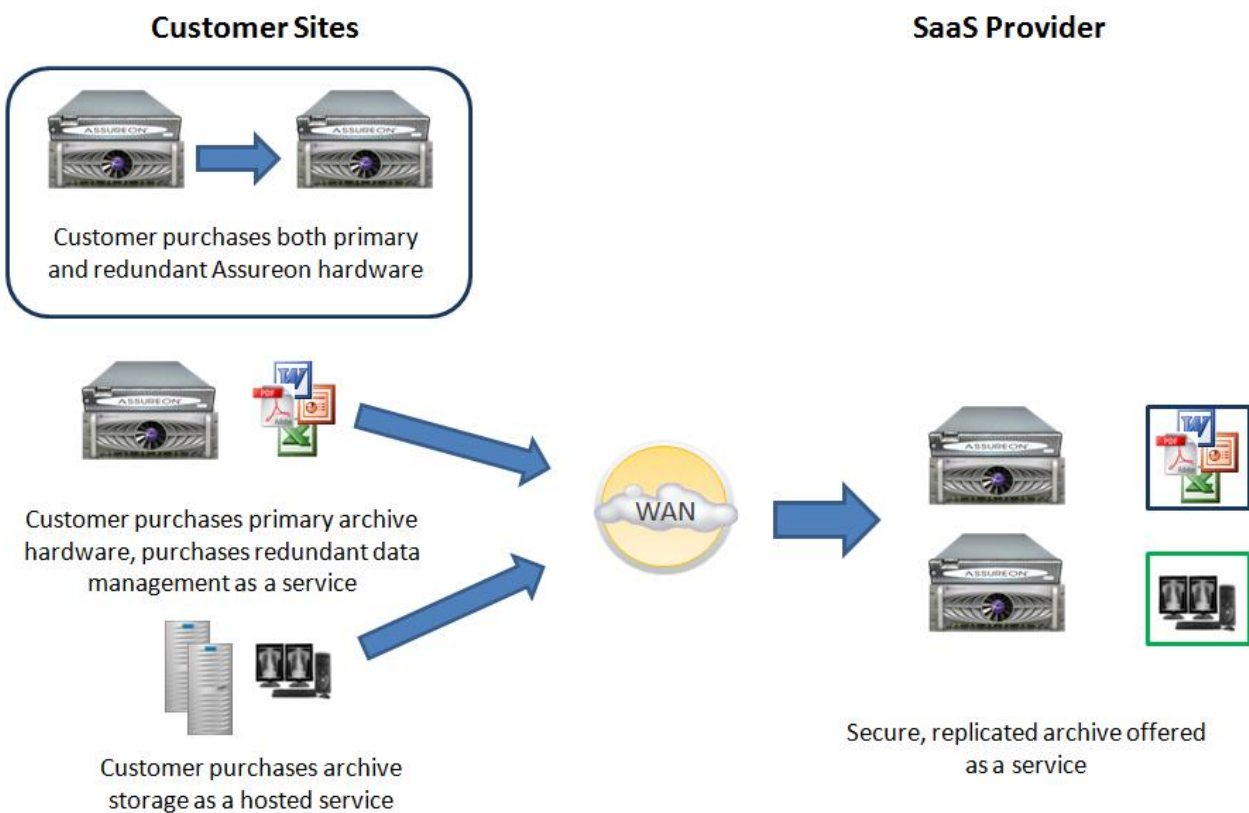
Assureon is a self managing content addressable storage (CAS) platform that extends Nexsan's family of highly efficient storage systems. Assureon is a disk-based online archive platform designed to be a simple, plug-and-play solution that enables organizations of all sizes to protect, retain, search, and retrieve unstructured digital assets. Applications producing fixed content can point to an Assureon located on the network as a shared drive and begin writing data to the device immediately. This simple process enables IT generalists in small enterprises and mid-market companies to quickly deploy the system with confidence.

Figure 2. Secure, Transparent Archiving with Assureon



Assureon is engineered with the goal of providing a secure, online archive for high value content in a high performance platform that is power-, space-, and cost-efficient. Windows 2003 and newer servers use a lightweight client that provides direct archiving to Assureon of any desired drives or folders while any platform that can mount an NFS or CIFS share can access Assureon through an integrated NAS gateway, completely transparently.

Figure 3. Flexible Deployment and Management Models



Assureon provides these benefits in a flexible, scalable package that allows customers to deploy their own self-managing archive solution or to engage a service provider to provide secure hosted archive services, as shown in Figure 3.

Hands-on: Assureon in Action

Assureon online disk storage archive provides numerous features to guarantee that files are safe from prying eyes, have not been tampered with, and are not corrupted over time. ESG Lab recently tested Assureon’s online archive capabilities in a simulated content management environment, focusing on data privacy, integrity, and longevity.

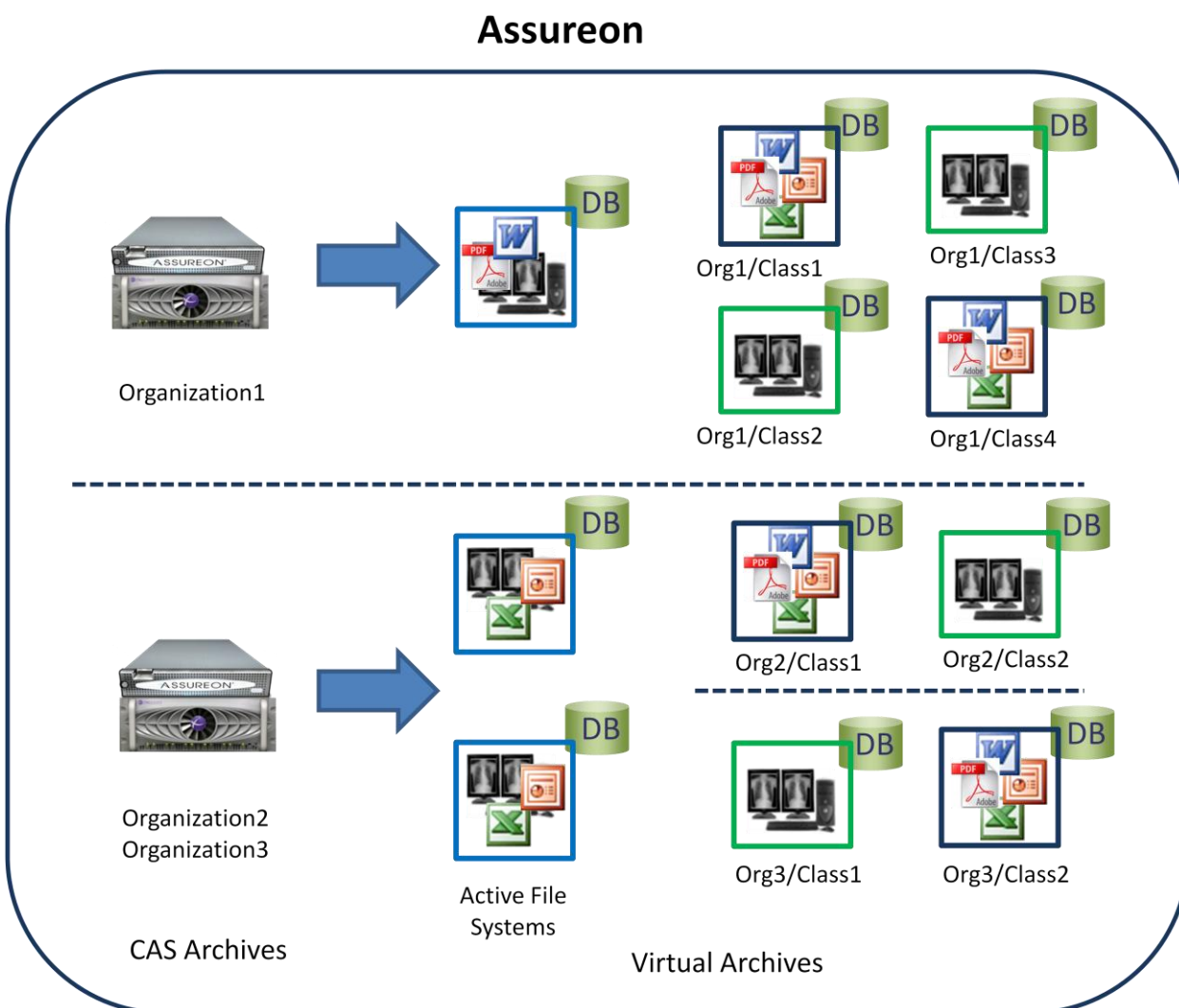
Privacy

Assureon uses the following capabilities to provide secured, private access to data, both within organizations and between multiple organizations sharing the same infrastructure.

- **Data Separation and Security:** Individual users, departments, or customers can store their files in their own virtual archive. Data is logically and physically separated, ensuring privacy and security.
- **Access Audit Trail:** Assureon establishes an unalterable audit trail for the life of an archived file. Every time a file is accessed, a record is kept of who accessed it and when it was accessed.
- **Encryption:** Assureon protects information privacy and security with AES256 encryption, ensuring the highest levels of file privacy and security.

To provide scalability and data separation, Assureon can be divided into separate CAS archives, providing physical data separation inside an enterprise or between customers of a cloud computing SaaS provider. Each CAS archive can house multiple virtual archives, each consisting of a separate database and CAS object store, as seen in Figure 4.

Figure 4. Data Separation and Security with Assureon



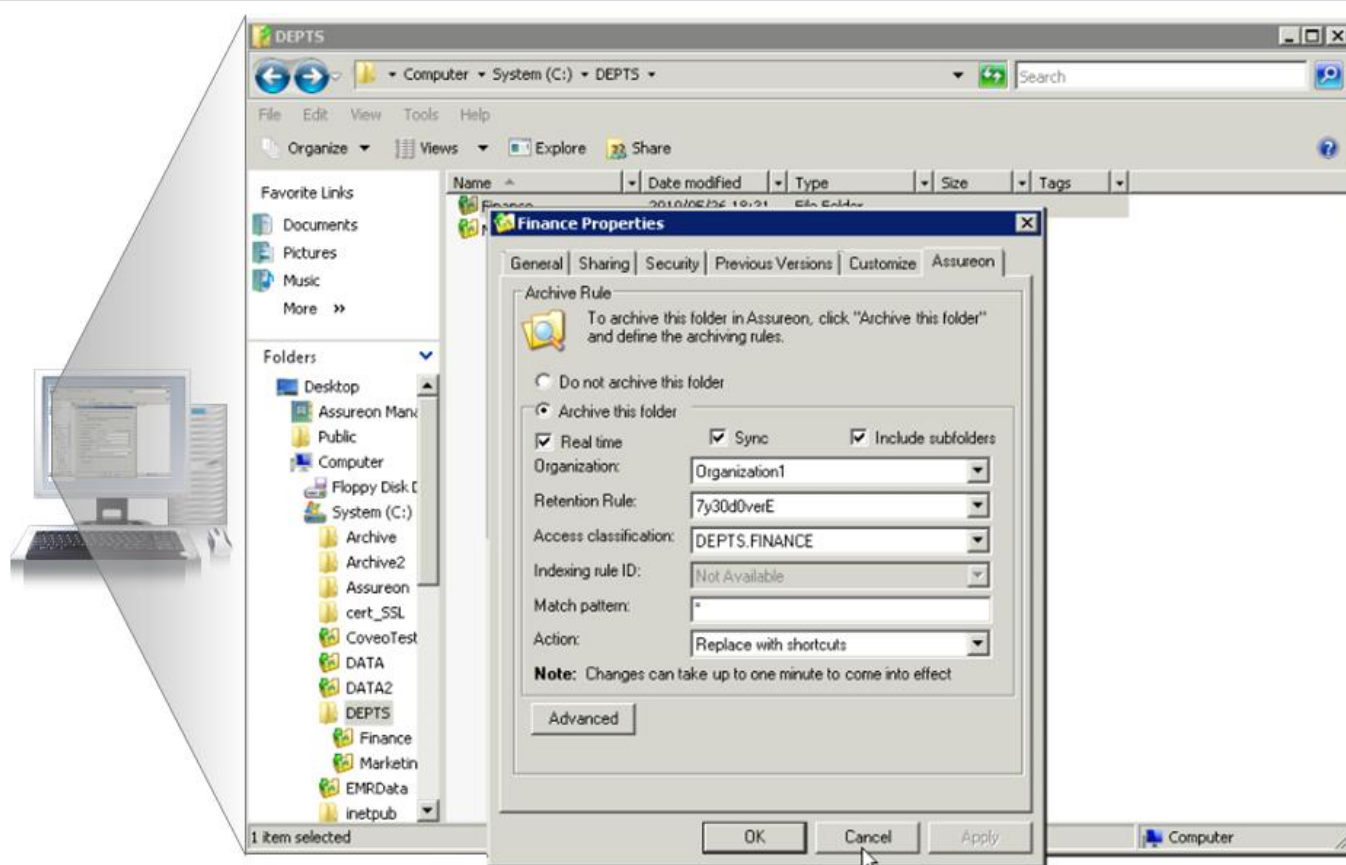
Assureon’s support for multiple virtual archives enables Assureon to scale, have no CAS object limits, and to take advantage of Nexsan’s AutoMAID reductions in power and cooling costs for infrequently accessed virtual archives. Each classification within a virtual archive can be further divided into subclasses, such as departments, for more granular control. All CAS archives and virtual archives and data classifications can be managed from a single pane of glass as a single system.

ESG Lab Testing

ESG Lab used a standard x86 PC running Windows Server 2008 with the Assureon client installed. Using Windows Explorer, a folder named DATA was created and its properties were accessed by right-clicking on the folder name.

As seen in Figure 5, the Assureon client adds a tab to the properties page to access and set Assureon archive policies. Administrators and users will only see the Assureon tab if they have permission to set policies.

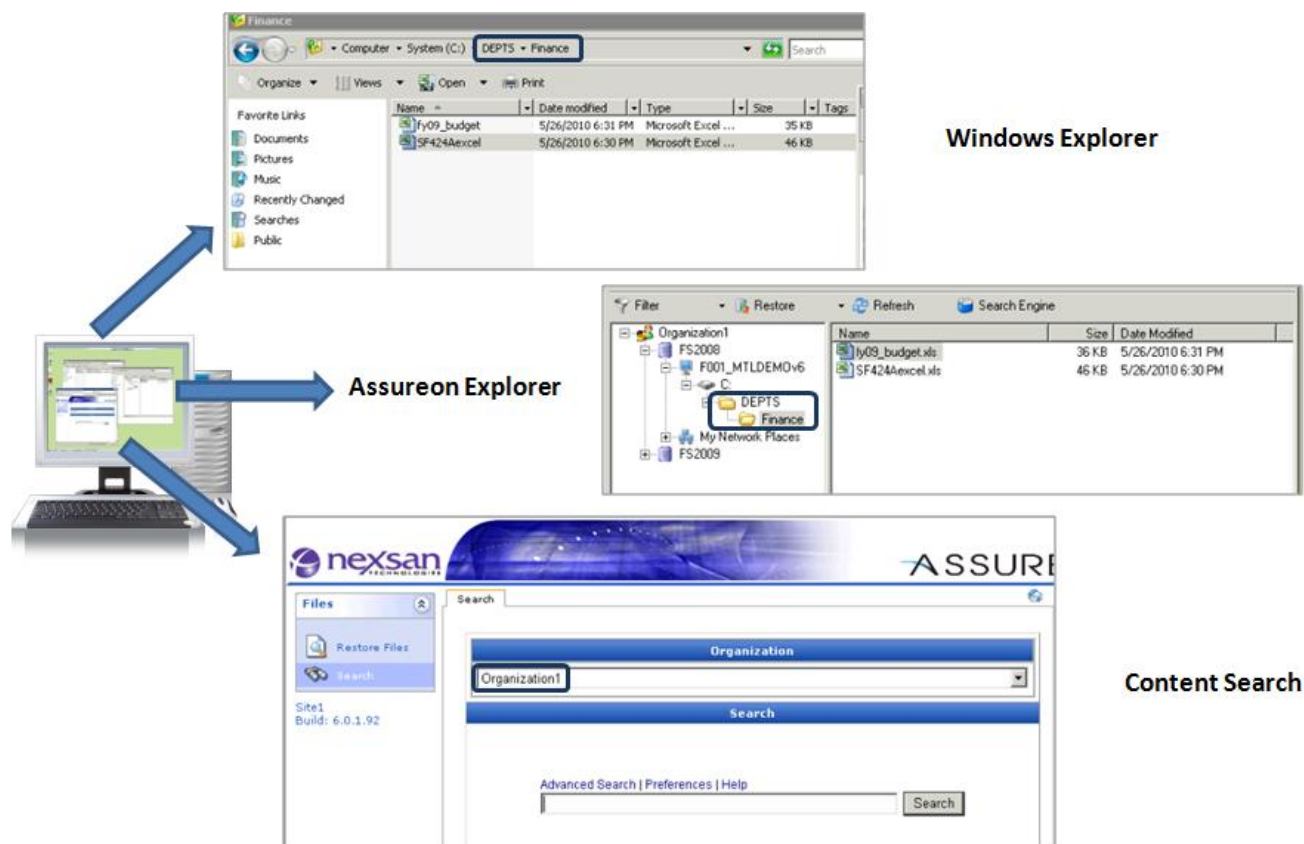
Figure 5. Nexsan Assureon: Configuring Archiving for an Application Folder



Two folders were created: Finance and Marketing. For both folders, ESG Lab set the organization name, retention rule, and action to be performed on all files created in or copied to the folders. Archiving can be set to real time and/or sync mode. Real time causes all files to be processed immediately upon creation and close or modification and close, while sync processes files manually or according to a schedule. For the purposes of this test, the action was set to “Replace with shortcuts” to immediately replace all archived files with shortcuts. Users have the option to leave the original files in place while still protecting the files in the archive, or set a threshold to have files replaced with shortcuts when space is needed. The Assureon Web GUI can be used to create more advanced or detailed archive policies, including setting flexible or compliant retention, setting the number of days before an archived file is replaced with a shortcut, or the specific file name pattern to match, if only certain files in a folder need to be archived.

ESG Lab tested data privacy by logging in as two different users, one from the Finance department, and one from the Marketing department, then examining their archived folders using Windows Explorer, Assureon Explorer, and the content search feature in the Assureon GUI. Only the folders and files each user had permission to see were visible.

Figure 6. Data Privacy with Assureon



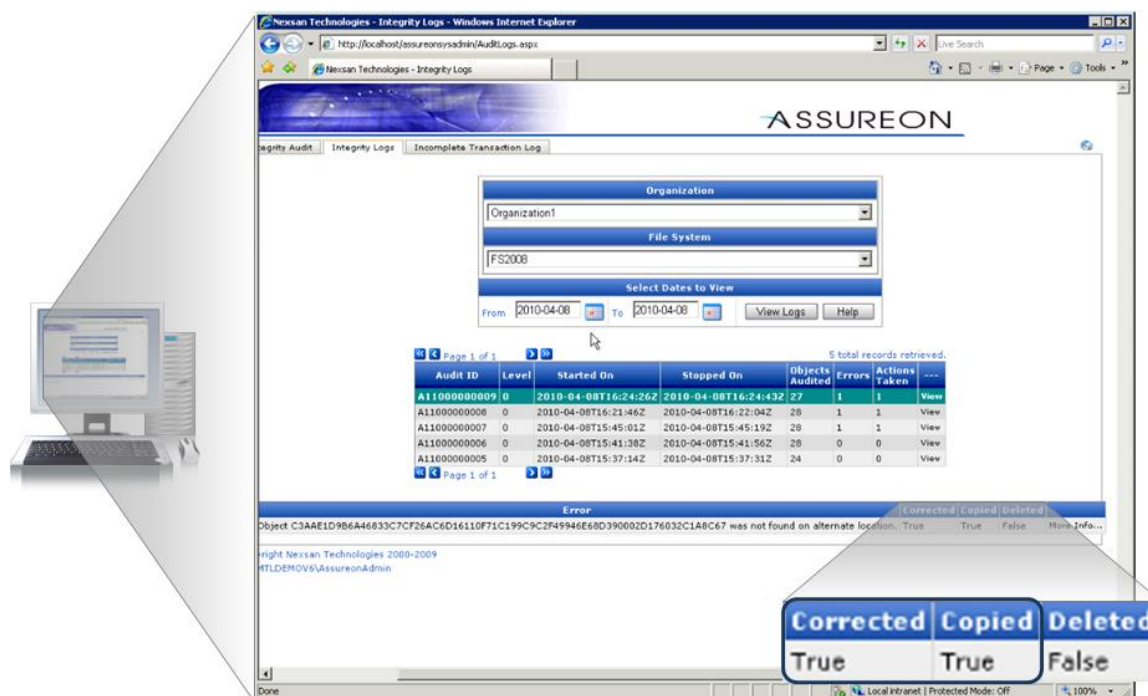
Integrity

Assureon ensures data integrity using multiple integrated techniques and technologies.

- **Fingerprint and Integrity:** When data is archived, it is assigned its own unique fingerprint that stays with the file through its lifecycle. If a single bit changes, the fingerprint will change.
- **Self-Auditing and Self-Healing:** Assureon continually monitors files for fingerprint discrepancies protecting against tampering, viruses, corruption, accidental or deliberate deletion, and theft. If discrepancies are discovered, Assureon notifies administrators and automatically self-heals the file.
- **Independent Date and Time Stamp:** Assureon's independent time source prevents modifications to the system's time clock ensuring the integrity of retention periods. With Assureon, tampering with the system clock or the date stamp on the file itself is prevented.

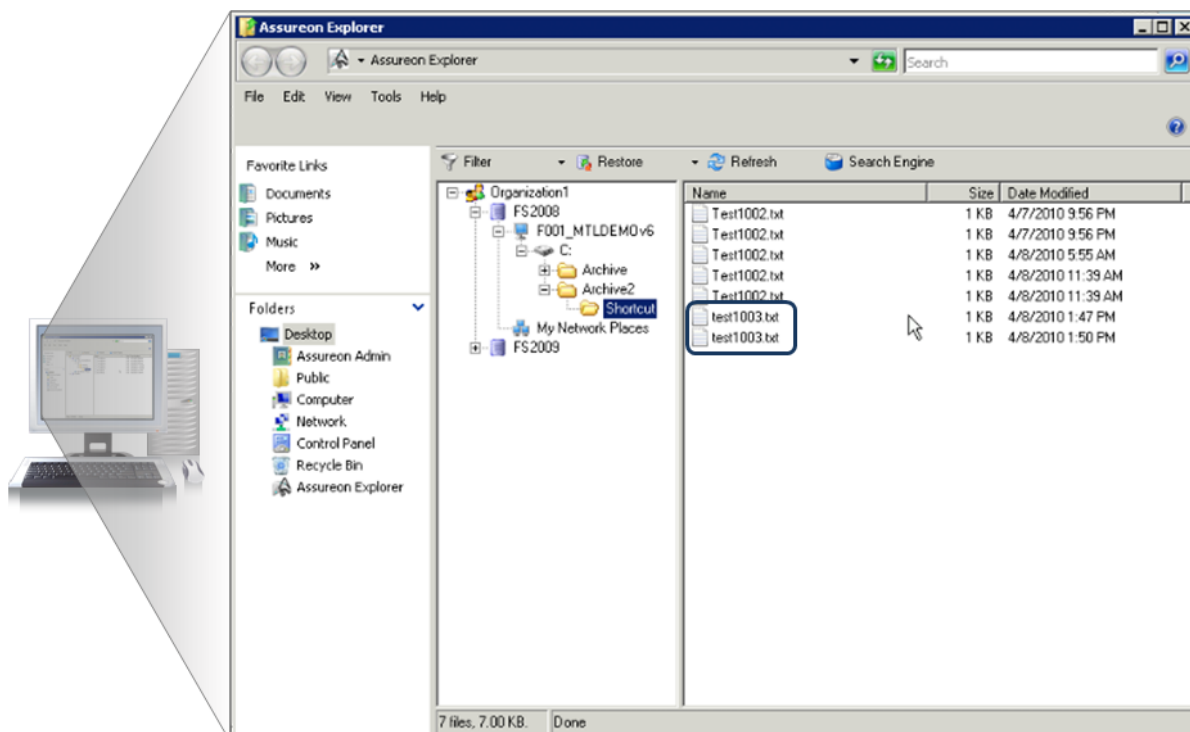
To test data integrity, a text file was created and copied into the folder created in the previous step. The copy operation completed instantly, with all the archiving and housekeeping functions, such as calculating the digital fingerprint, completing automatically and transparently. The file was examined and verified that the text was exactly as entered. Next, the file was intentionally "corrupted" by changing the contents of only one copy. ESG Lab examined the integrity log, shown in Figure 7. Self Auditing and Self Healing after the system completed an automatic integrity audit. The integrity log shows that the changes to the object were detected, corrected, and the corrupted copy of the file was copied to a quarantine area to preserve it for investigative purposes.

Figure 7. Self Auditing and Self Healing



ESG lab examined the contents of each version of the file using Assureon explorer, confirming that the contents of the file had been restored to the correct state.

Figure 8. Archive Contents in Assureon Explorer



It's important to note that Assureon explorer enables administrators to restore shortcuts, or full files, to a production server by right-clicking on the file and selecting the appropriate action.

Longevity

Longevity is the ability to guarantee that all versions of a file will remain immutable and uncorrupted over time. Assureon uses multiple techniques to provide file longevity.

- **File Availability Audit:** Assureon serializes each file and continually checks to ensure all files are present in each store. If a file is missing, Assureon notifies administrators and automatically returns it to its original state.
- **Automated Retention and Deletion:** To satisfy regulatory compliance or corporate governance, organizations need to guarantee the retention and deletion of files. With automated integrity management and file immutability technology, Assureon protects against accidental or unauthorized file deletion and ensures files can be retained for compliant or flexible time periods as well as securely deleted when their retention period expires.
- **Legal Holds:** Legal holds can be placed on files to protect against file deletion when retention periods have expired. This ensures availability of files in cases of litigation or potential litigation.

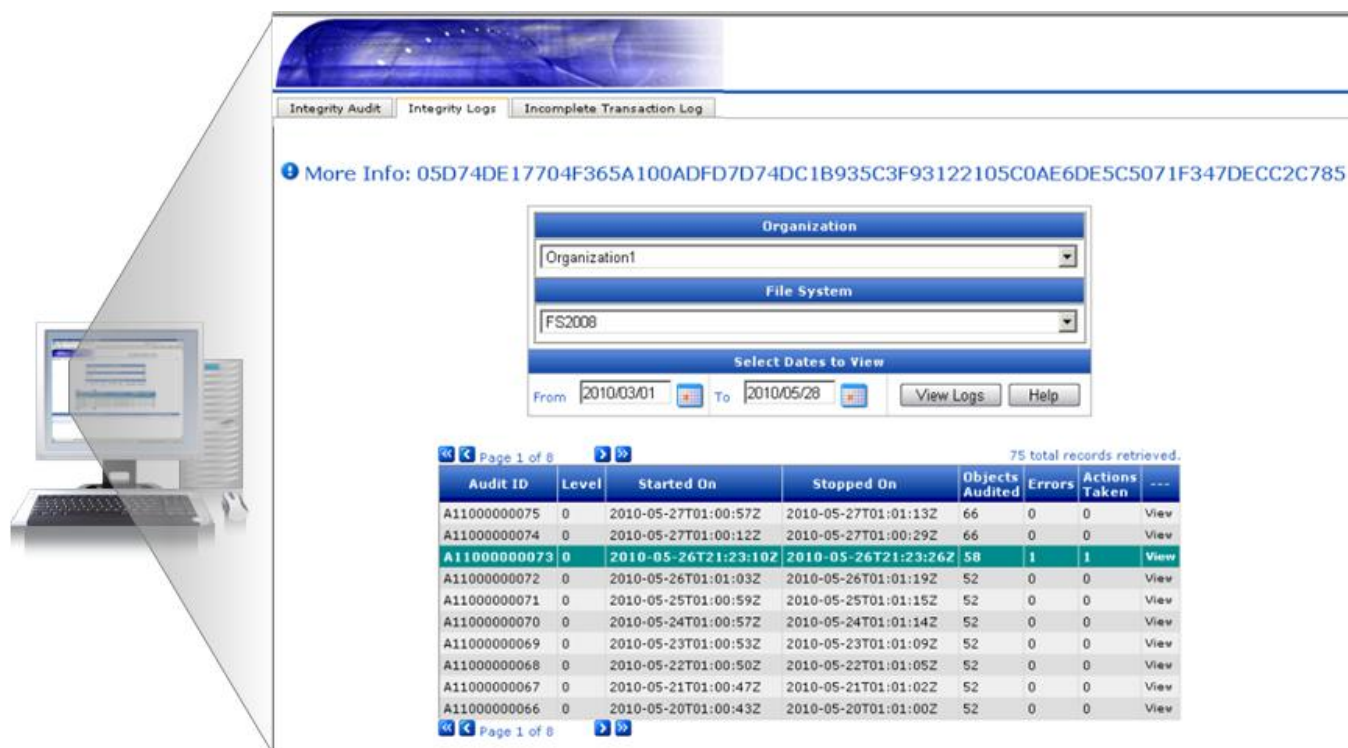
ESG Lab examined multiple aspects of file longevity. The retention rules page is shown in Figure 9. Assureon has the ability to create separate sets of retention rules for every organization created in the system. Each organization can create multiple rules within each organization to provide appropriate retention for any data type.

Figure 9. Assureon Audit Log

Rule Name	Retention	Encrypt	Compress	Minimum Retention (Days)	Maximum File Versions	Last Saved
180days	180	False	False	1	0	
30Years	10950	False	False	1	0	
30YearsE	10950	True	False	1	0	
30YearsEC	10950	True	True	1	0	
365days	365	False	False	1	0	
365daysE	365	True	False	1	0	
365daysEC	365	True	True	1	0	
5years	1826	False	False	1	0	
5yearsE	1826	True	False	1	0	
5yearsEC	1826	True	True	1	0	

A retention rule was created with a retention period of seven years and data encryption enabled. Next, the audit logs were examined and it was confirmed that Assureon was running both file availability and integrity audits daily, restoring corrupted and lost files as necessary.

Figure 10. Assureon Audit Log



Why This Matters

ESG research indicates that unstructured data—such as office documents, e-mail, web pages, digital images, and audio and video files—consumed more than 6,200 petabytes of storage capacity in 2009 and that volume will nearly quadruple to more than 22,000 petabytes by 2012. Simply managing growth on this scale in primary and archive storage will present significant administrative and management challenges. Any archive solution targeted at such an environment needs to be able to integrate tightly and scale along with the infrastructure while providing easy to manage file security, guaranteeing data integrity, and ensuring data immutability for the appropriate retention periods.

ESG Lab validated that Assureon enables organizations to rapidly integrate archive into their file and application environments and automatically index those mountains of data using flexible policies with minimal administrative effort, while integrating with existing authentication and access control frameworks to minimize the risk of unauthorized persons accessing confidential or restricted-access data. This helps organizations avoid the additional time and cost of recreating the file access security hierarchy already in place.

Assureon proved its ability to self heal and guarantee data integrity by automatically restoring both corrupted and lost files with no administrative action necessary.

ESG lab evaluated file longevity functionality and found the retention policy engine to be robust and complete, providing a methodology to create flexible, detailed retention policies and legal holds. Again, self auditing and healing ensured that files remained intact and unchanged over time, guaranteeing that files would be there when needed.

The Bigger Truth

ESG research has found that unstructured file data accounted for 74% of global digital archive capacity in 2009 and is expanding at a compound annual growth rate of 79%. The worldwide capacity for file-based unstructured data dwarfs that of database and e-mail data combined—and growth is accelerating. Organizations must deal with all this growth while meeting compliance and governance standards and controlling the cost of search and discovery. In this scenario especially, additional complexity is not desirable.

Nexsan's Assureon is an excellent fit for businesses of any size that require intelligent archiving with CAS. The low cost of entry makes this solution available to a whole new set of IT departments that until now simply couldn't afford to acquire or manage such technology. Companies can implement robust data security and protection with limited IT resources, and still utilize enhanced search capabilities to quickly produce pertinent data for internal investigation and litigation support without having to incur additional expenses from service providers culling through vast archives of data located on different media types.

Assureon delivers more business value by minimizing the power, space, and cost for given capacity and performance workloads. In addition to its powerful archiving tools, Assureon allows users to move away from a traditional tiered storage implementation and to gain the added IT and business benefits of Nexsan's highly efficient storage.

ESG Lab was quite impressed with Assureon's transparent and simple integration into a standard server environment, integrating archive policies, classification, search, reporting, and migration into one intuitive package. ESG Lab testing revealed that Assureon provides excellent data privacy, integrity, and longevity in a package that is as easy for small businesses to deploy and manage as it is for large enterprises or service providers. The platform scales performance and capacity independently, leveraging Nexsan's family of highly efficient RAID enclosures and industry standard servers. It is clear that Nexsan is continuing to execute on its vision to provide users with a highly integrated storage infrastructure.

The company does face a couple of notable challenges. First, the CAS market has never exploded in quite the way that some imagined it would and second, the CAS market that does exist also has a very dominant player (EMC). However, like so much in life, the flip side to challenge is opportunity: EMC and others have shown that a decent market *does* exist and it's all open to Assureon if its channel can find a way to the table; Assureon brings a level of simplicity and functionality that could well both expand the realistic market potential and certainly give prospective users more than a moment's pause before leaping with the default solution. If Nexsan were a brand new player, its task might be very difficult indeed—however, it is a proven, relatively small, but high quality—provider with a base of “raving-fan” users. Nexsan already has several large medical OEMs supplying Assureon to medical and PACs archive end users.

ESG Lab found the system to be extremely easy to manage, providing policy based archiving while preserving privacy, guaranteeing data integrity, and protecting data longevity from a single, simple interface. In ESG's opinion, Assureon will enable organizations to reduce their costs and simplify their infrastructures while providing enterprise class archiving services at the speed of online disk.