



Assureon Archiving

Move from hope to knowledge on data integrity

Paul Jassies – Assureon Sales Director, EMEA

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Nexsan by Imation

A bit of history..

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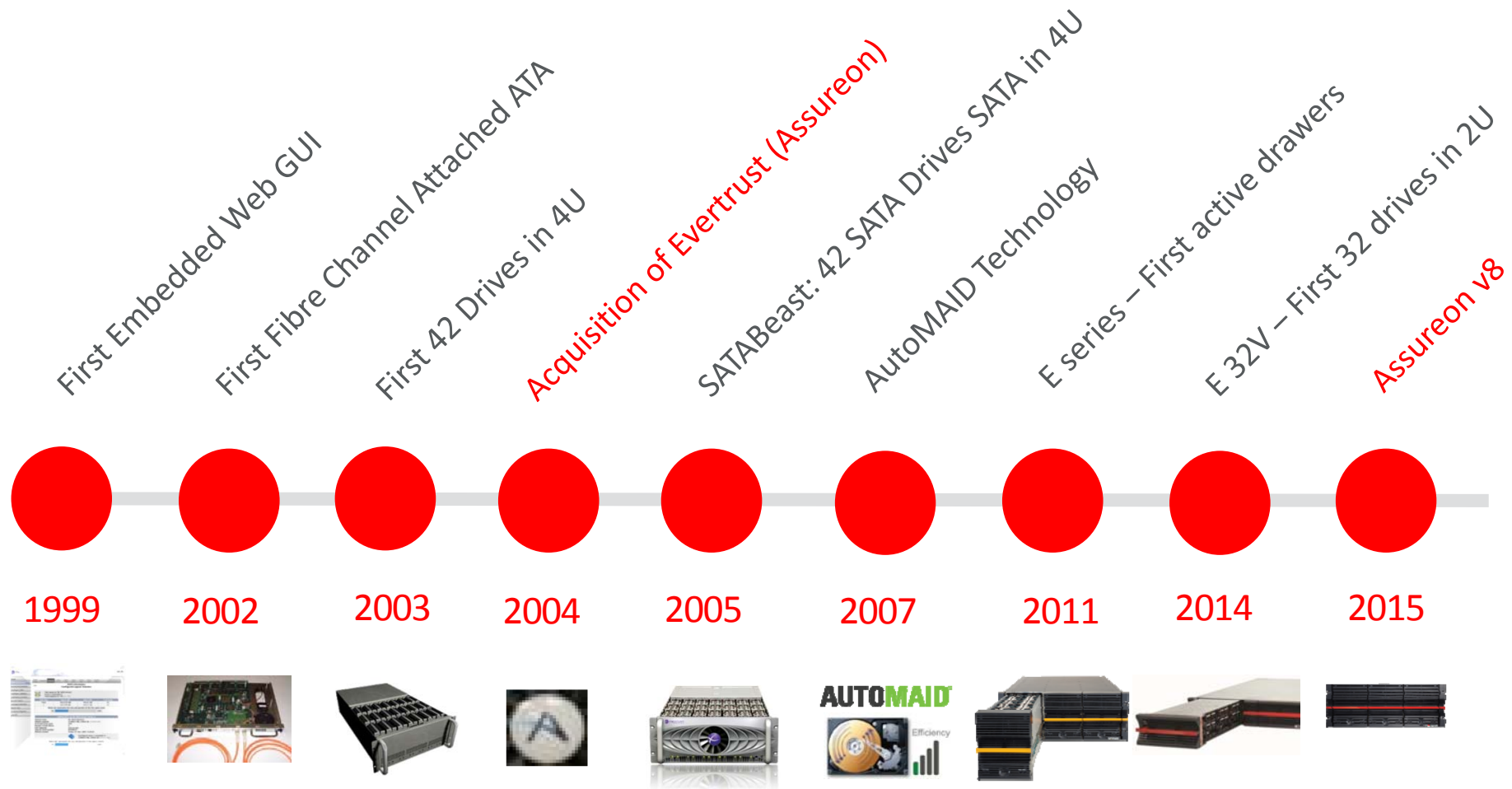
Nexsan – Company is just 2 years into business

- 2001 – Enterprise? Really?
Supercomputer storage i Linköping, Sweden



That is one
Nexsan ATABoy
feeding data to a
512 processor
supercomputer cluster !!

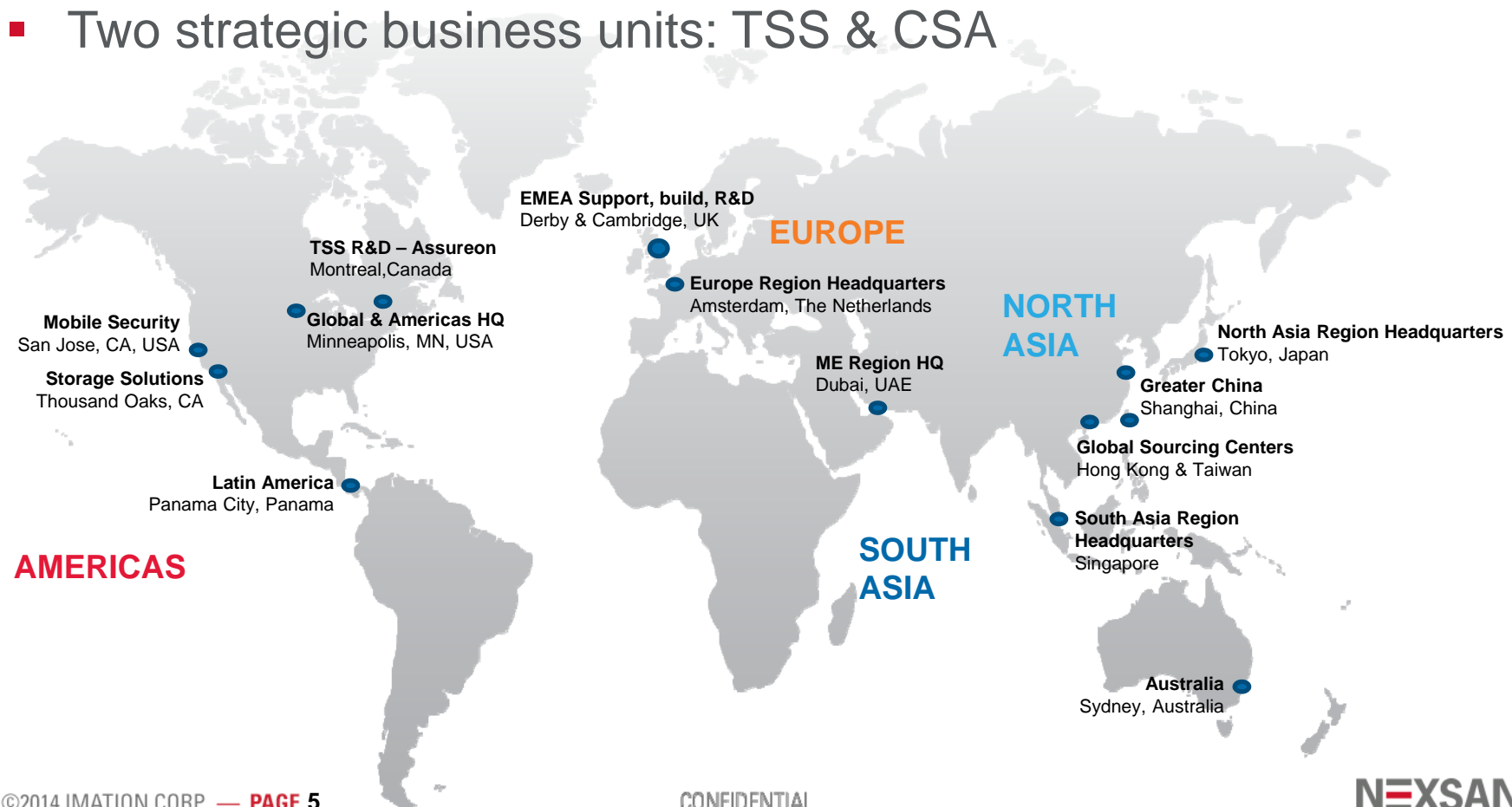
History of Nexsan



+10 Years of Archiving!

IMATION - Data Storage and Information Security

- Global R&D and Support with 940 employees
- Strong financial position:
 - 2013 revenue of \$860.8M
 - 2013 cash of \$132.6M
- Two strategic business units: TSS & CSA



Flexible and reliable storage systems.



Unified Hybrid Storage

NST

Flexible storage for mid-sized enterprises

Hybrid design leverages SSD for performance

Scales to 5 PB (7,5 PB)



High-Density Storage

E Series

Industry Leading Reliability & Availability

Highly Dense Design with 360 TB in 4U

Best-in-Class TCO



Secure Archive Storage

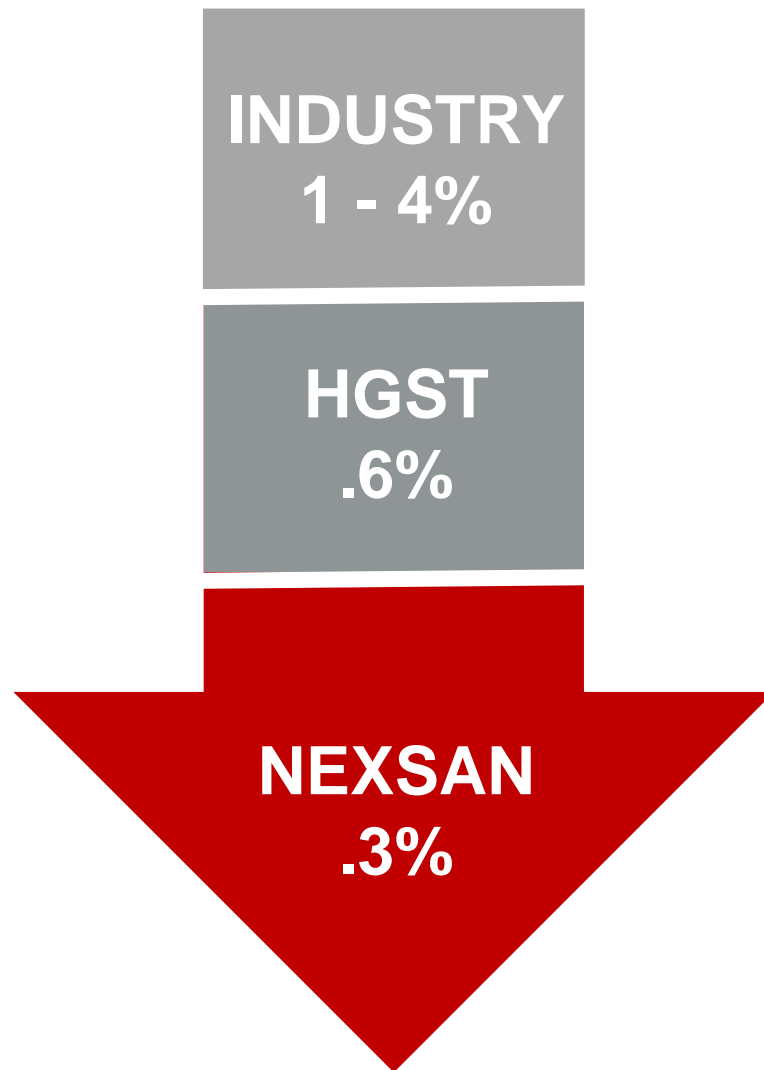
Assureon

Automated archive solution for high value data

Secure data storage for regulated applications

Long term Audit Trail

Highest Drive Reliability



- #1 Industry complaint by end-users on most storage systems?

DRIVE FAILURE RATE

- Nexsan's failure rate is:
 - 3 times less than industry average
 - ½ that of HGST's
- Engineering & Design
- Drive screening & testing

AutoMAID[®] Industry-leading Power Efficiency

■ Level 0:

- Disks at Full Power

■ Level 1:

- Heads Parked / Unloaded
- Sub-second recovery time
- 15% to 20% savings

■ Level 2:

- Heads Unloaded, Slows to 4000 RPM
- 15 second recovery time
- 35% to 45% savings

■ Level 3:

- Stops Spinning (sleep mode; powered on)
- 30 to 45 second recovery time
- 60% to 65% savings

■ Level 4:

- Stops Drive Electronics
- 30 to 45 second recovery time
- Up to 70% savings

■ Level 5:

- Turn off E60X expansion enclosures
- 30 to 46 second recovery time
- Up to 87%



AUTOMAID[®]

Requires no change
in application layer or
from a user
perspective

What is Assureon?

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Assureon – Very simply said

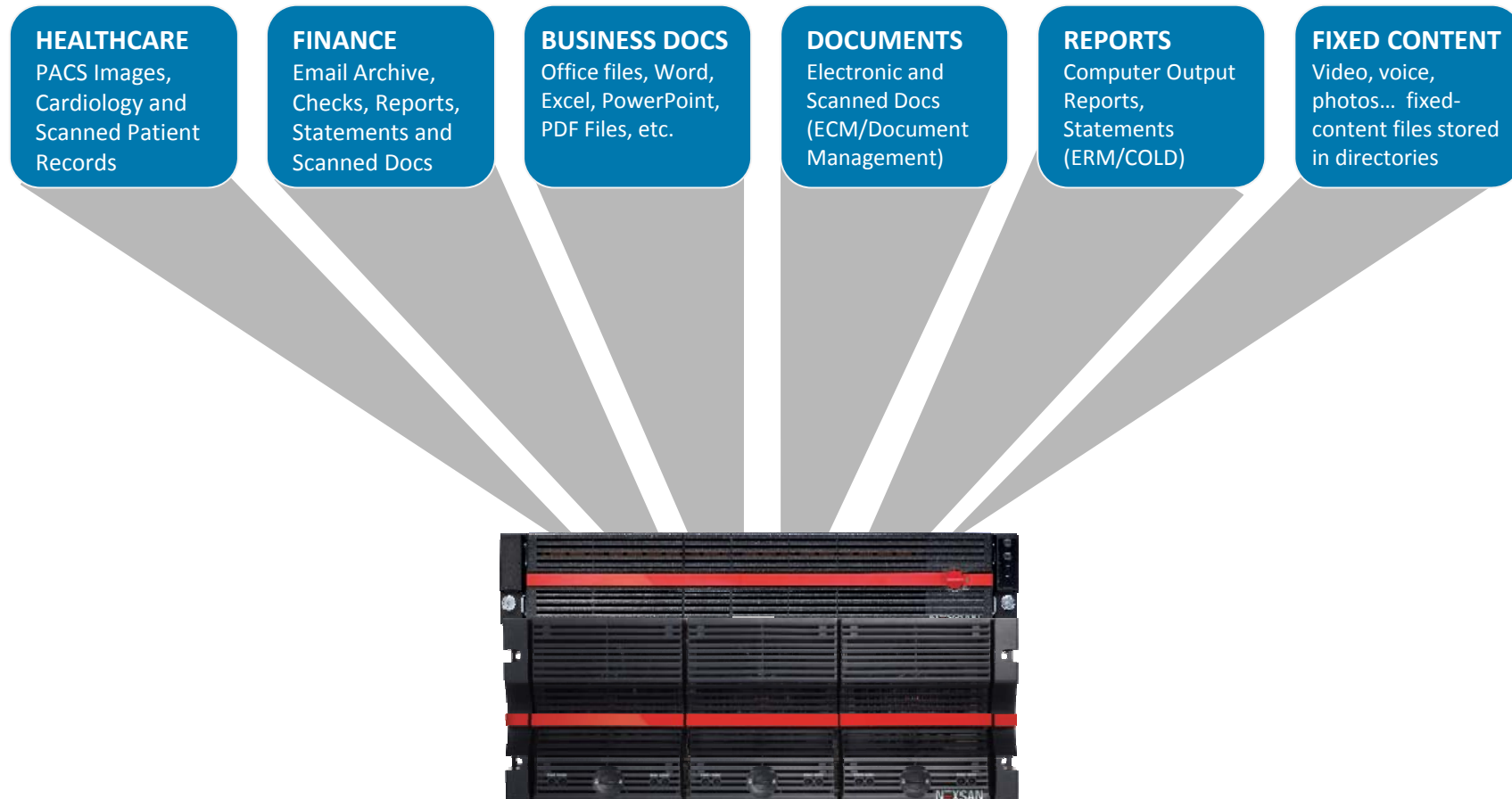
Secure Long Term Archival: Assureon

Assureon® is designed for the long-term preservation of critical / high-value data.

As a **self-monitoring** and **self-healing** WORM storage system, Assureon **automatically validates the availability and integrity of all files** so you never have to worry about corruption, tampering or loss.

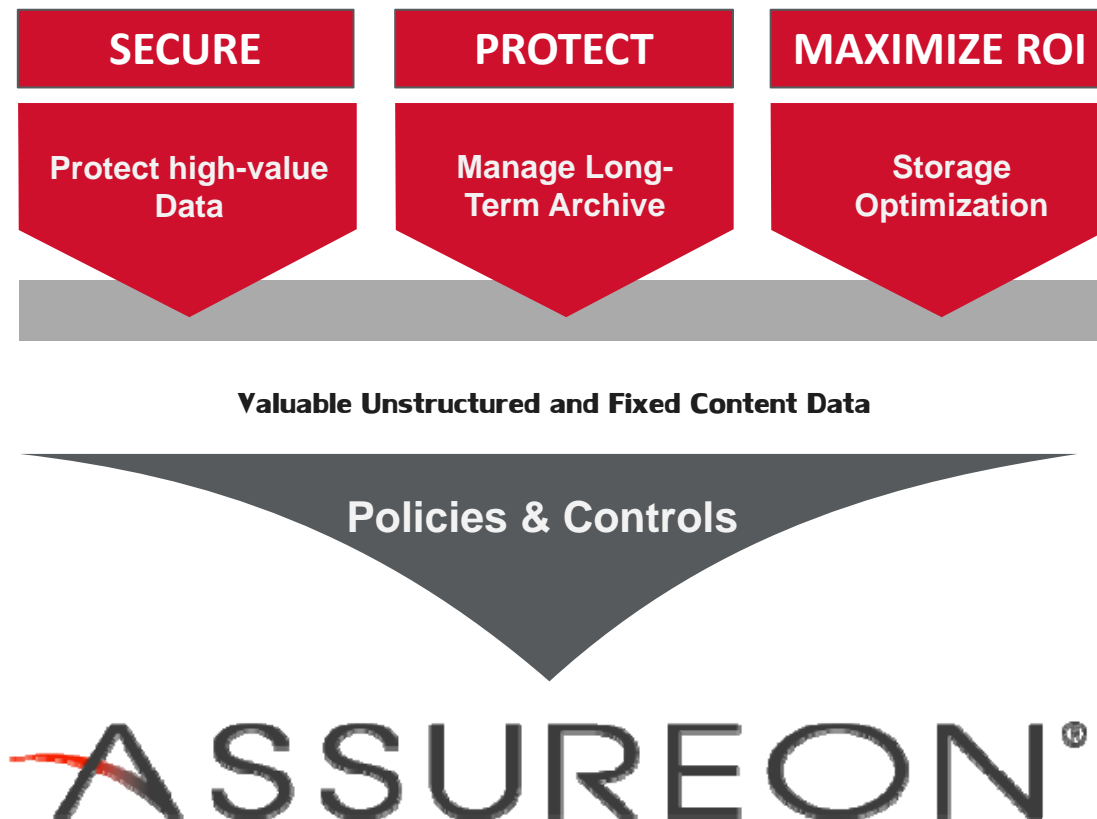
Assureon is an **open, non-proprietary archive system** that is priced to fit departmental and enterprise budgets, and flexible enough to scale and support these configurations without compromising on quality and features.

Data Protection and Infrastructure Optimization



Assureon
Privacy ♦ Integrity ♦ Longevity

Assureon Value Propositions



How does Assureon work?

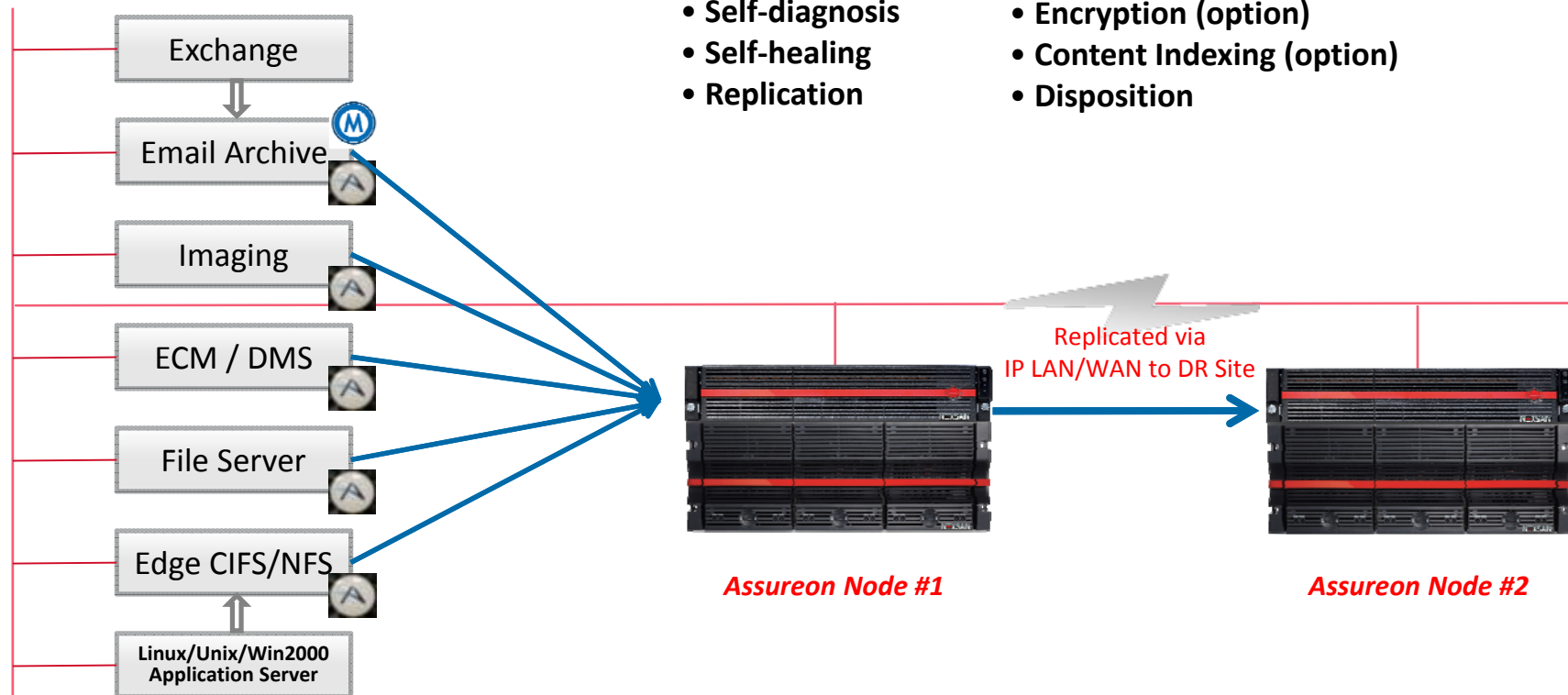
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Assureon at work!



Your application and file servers



- Retention Policies
- Security Access
- Self-diagnosis
- Self-healing
- Replication
- Maintains Audit trails
- Reporting
- Encryption (option)
- Content Indexing (option)
- Disposition

 Assureon Windows Client

 Exchange Connector

Basic Assureon Operation



Assureon Client on
Windows Server

Assureon Processing Node



Assureon Storage Node

Site 1

Assureon Processing Node



Assureon Storage Node

Site 2

Shortcuts



Assureon Client on
Windows Server

Optimized reads
via shortcuts!

Assureon is FAST!

Assureon Processing Node



Assureon Storage Node

Site 1

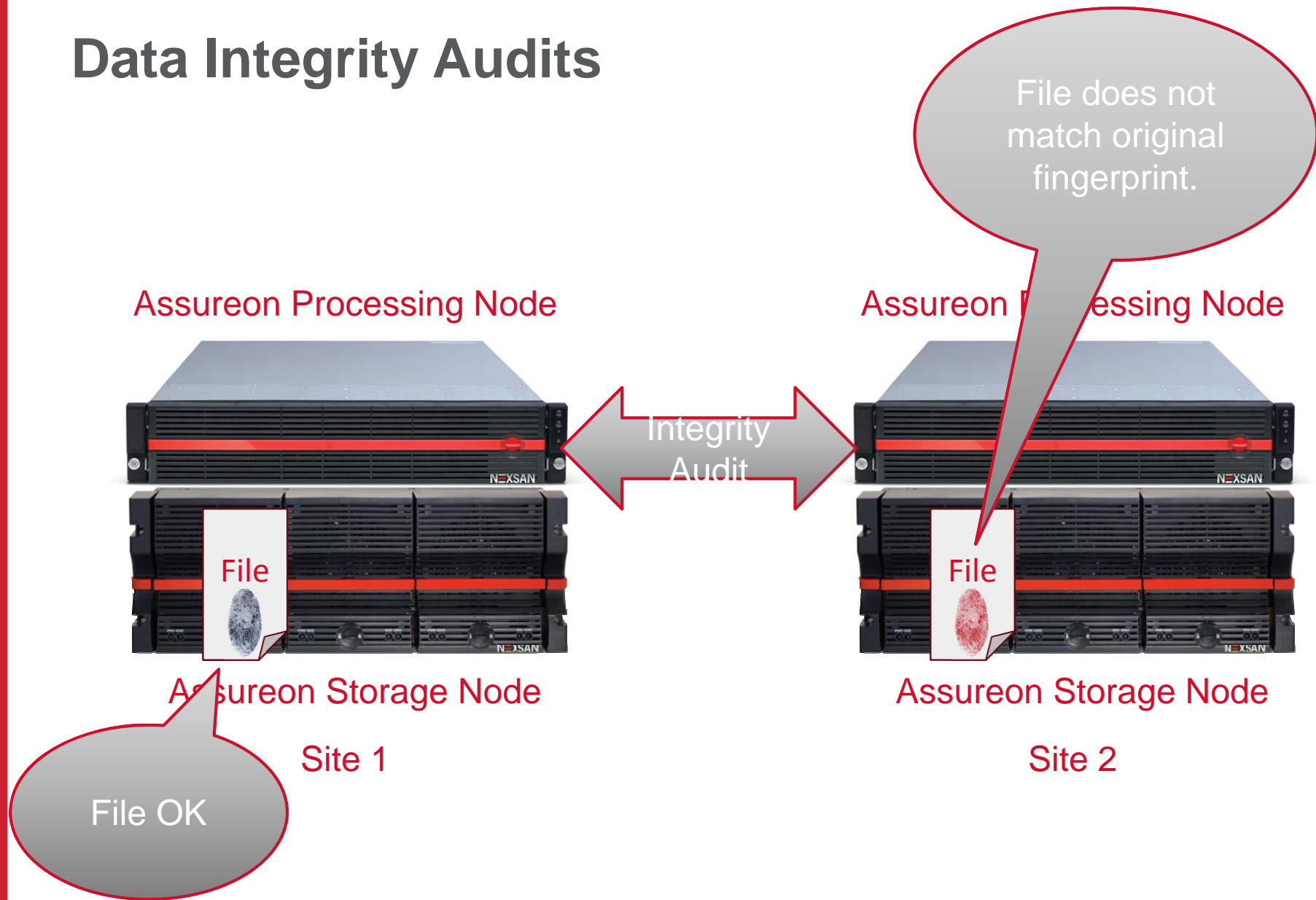
Assureon Processing Node



Assureon Storage Node

Site 2

Data Integrity Audits



Assureon Deployments

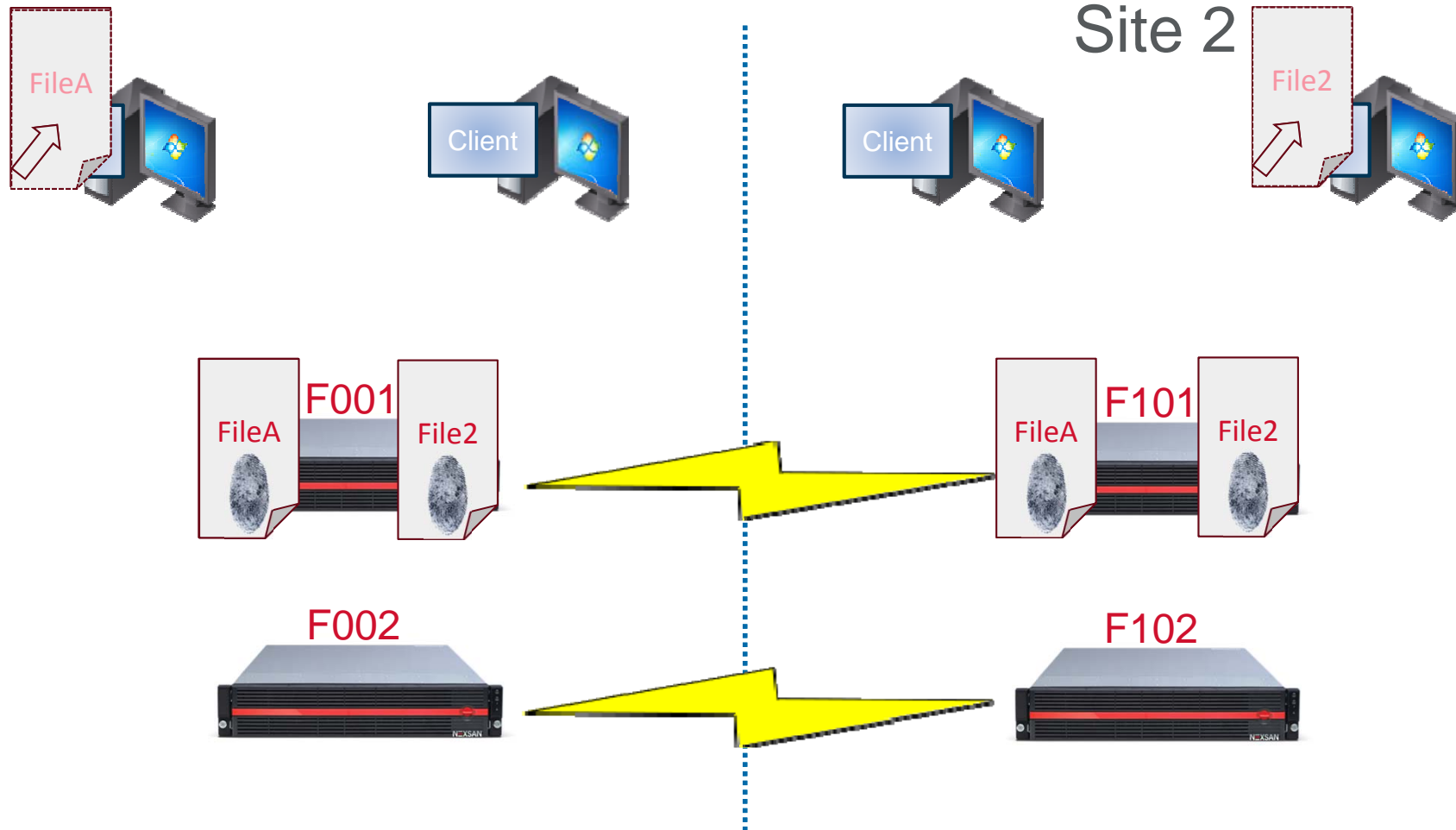
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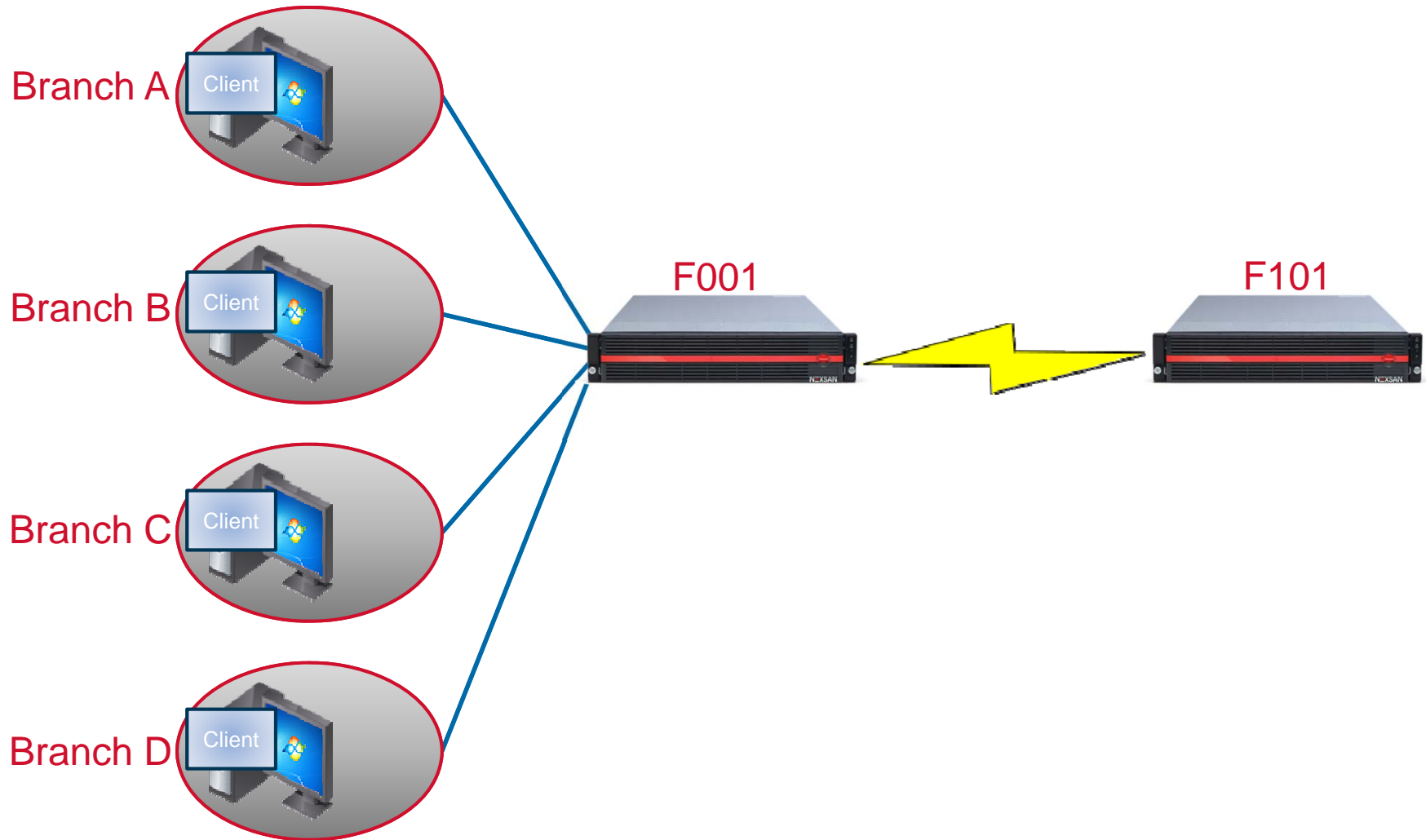
Primary/Secondary Sites

Site 1

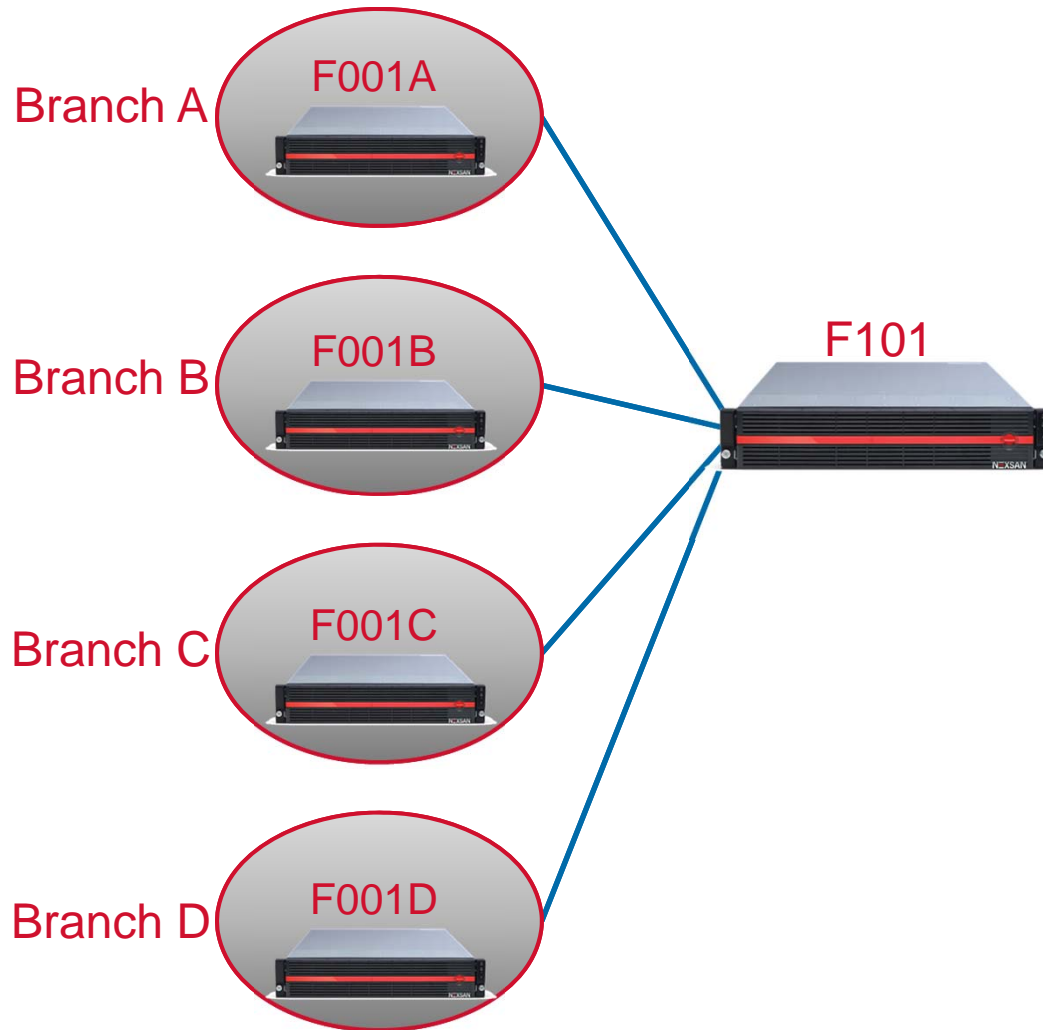
Site 2



Multiple Client Sites

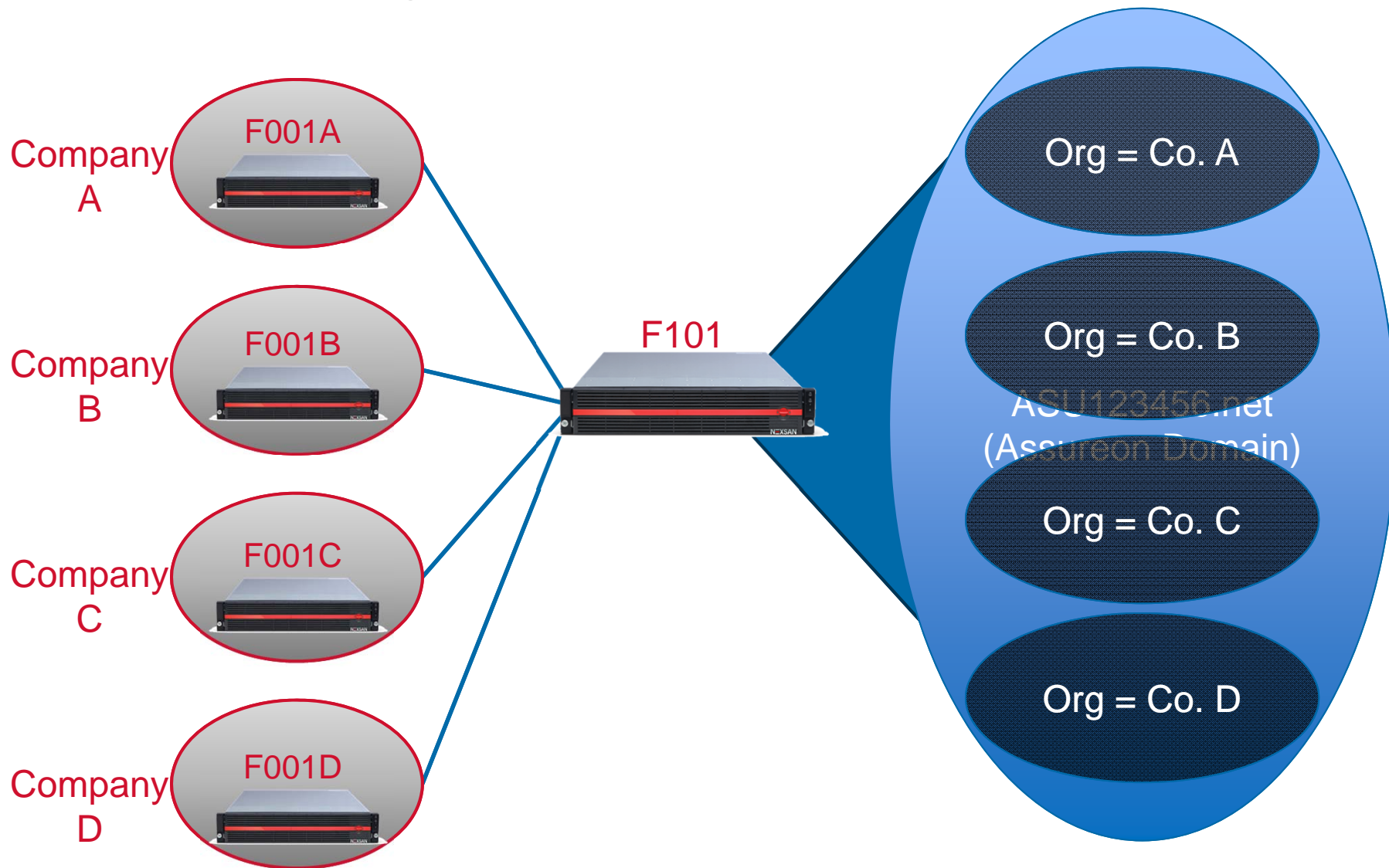


Multiple Assureon Sites



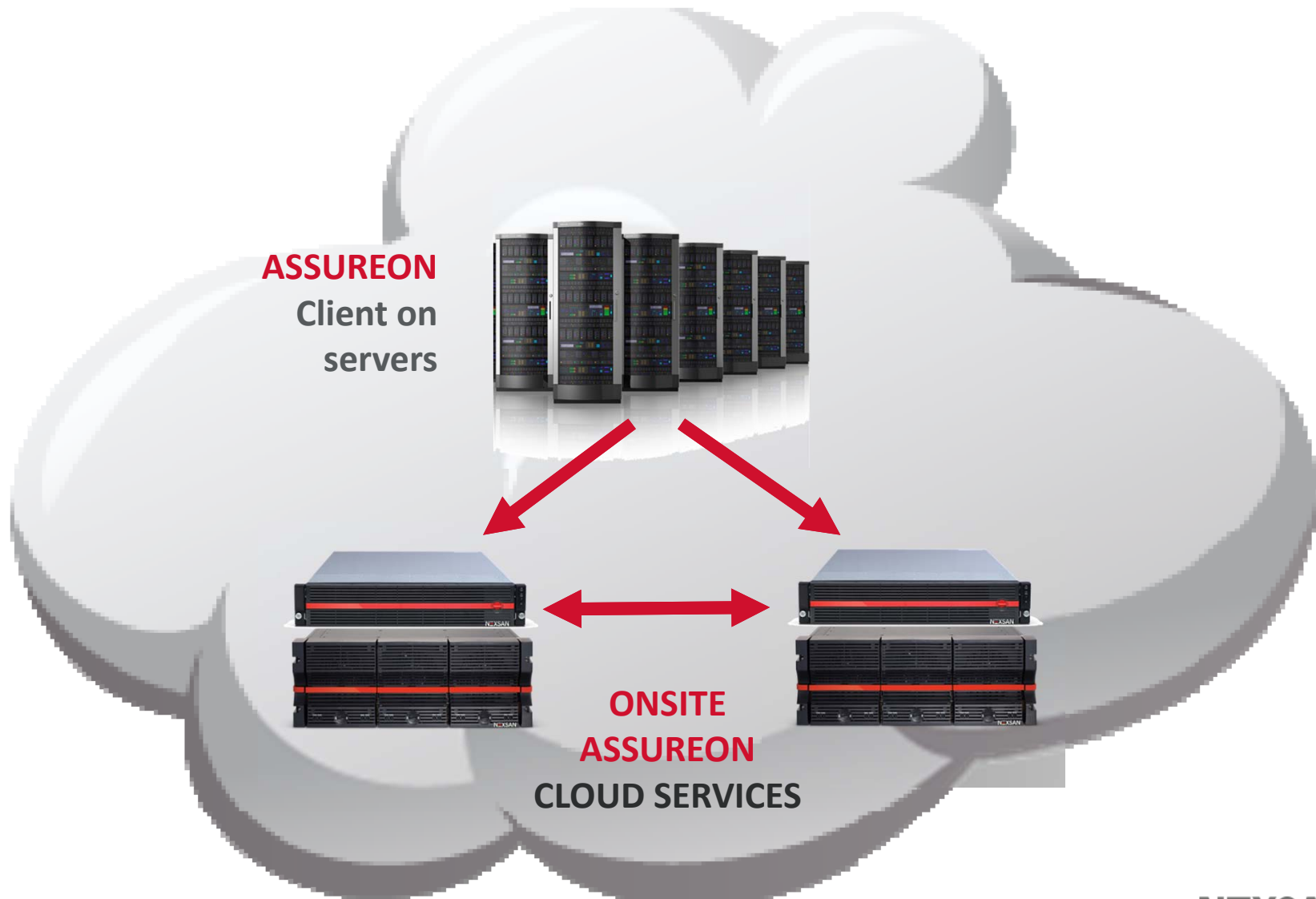
- Local Access to Assureon
- Multi-Tenancy Application

Multi-Tenancy Assurance Sites

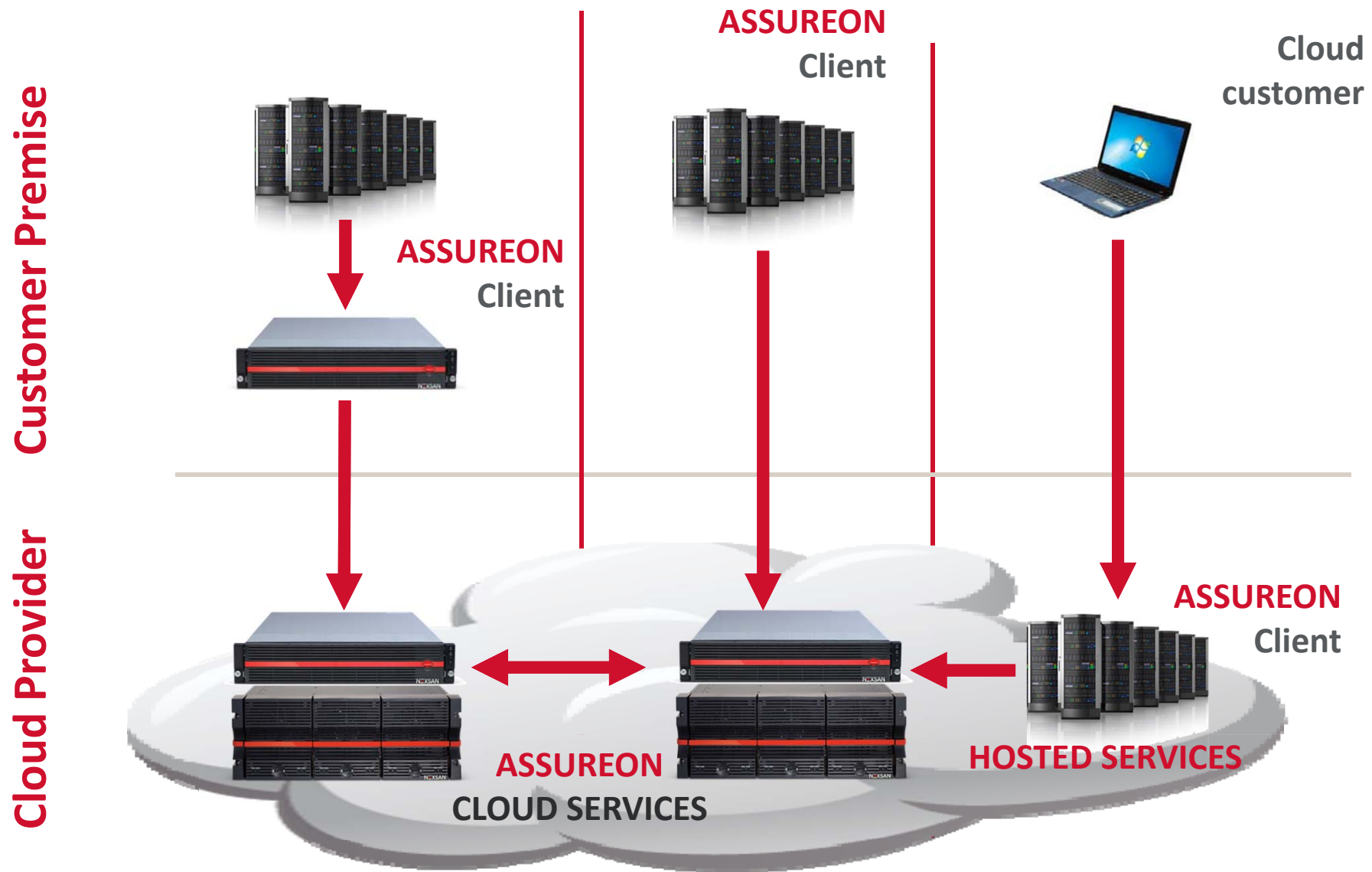


Secure Cloud Storage – Private Cloud

Customer Premise



Secure Cloud Storage – Public Cloud



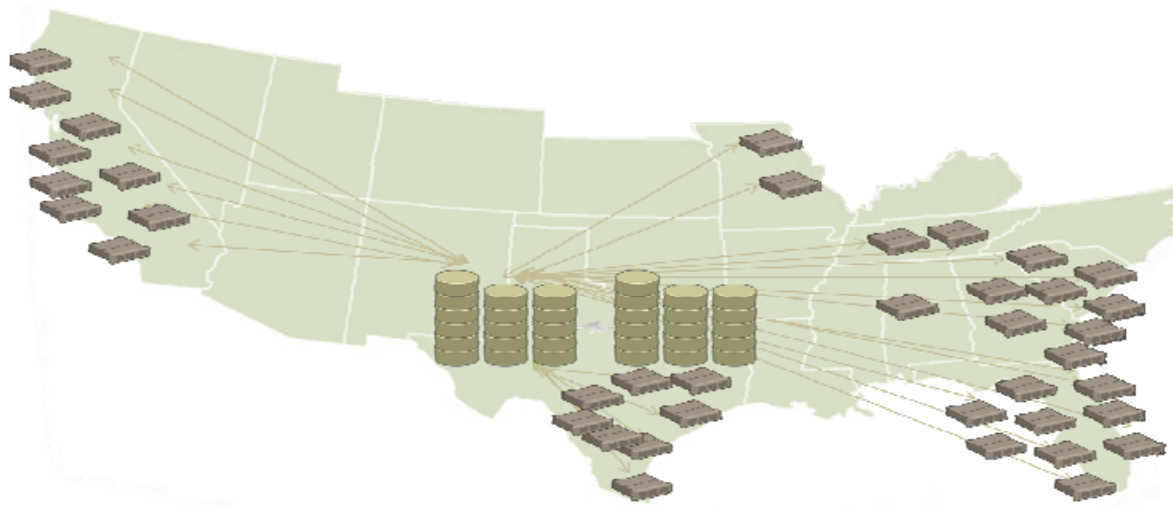
Tenet - Private Cloud Archive - Overview

Configuration

- Centralized Assureon Archive 800TB Replicated
- 37 remote facilities with Nexsan Edge (mount)

Benefits

- Efficient consolidated footprint, cost efficient
- Secure fingerprint assigned at facility (before archived)
- Integrity validated at each stage of ingestion and ongoing
- Curb cost on power and cooling with AutoMAID



Key features of Assureon

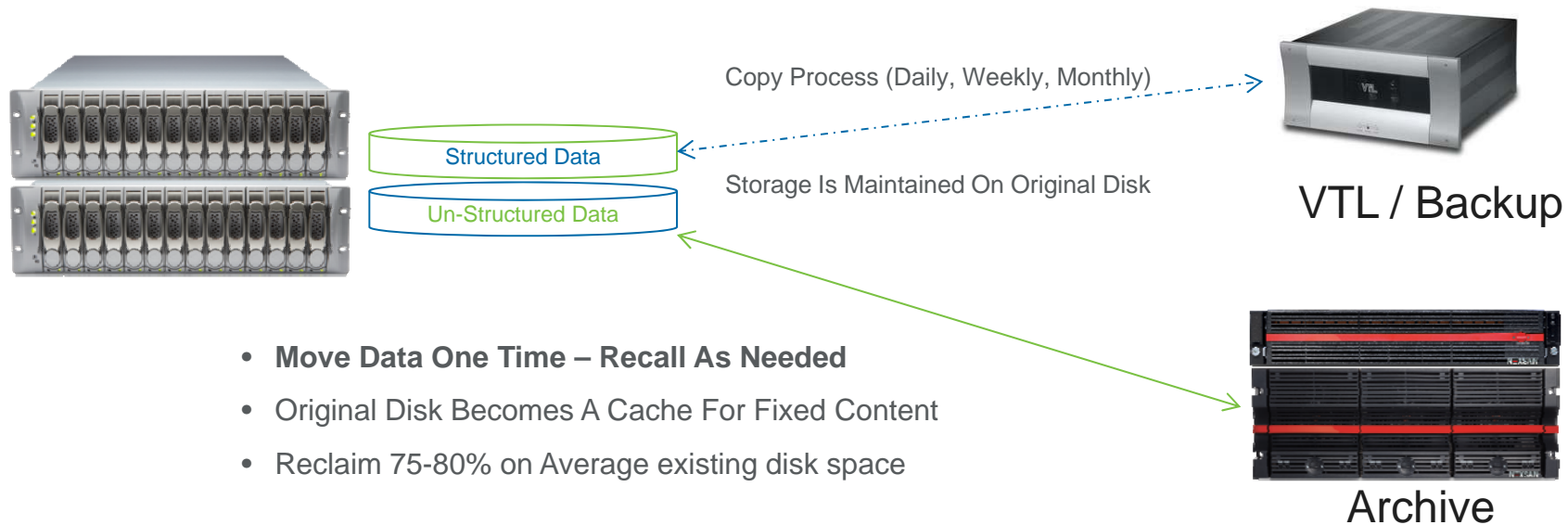
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Backup and/or Archive

Backup: A backup refers to a copy of data that may be used to restore the original in the event the latter is lost or damaged beyond repair – example: in a disaster recovery situation. It is a safeguard for data that is being currently used.

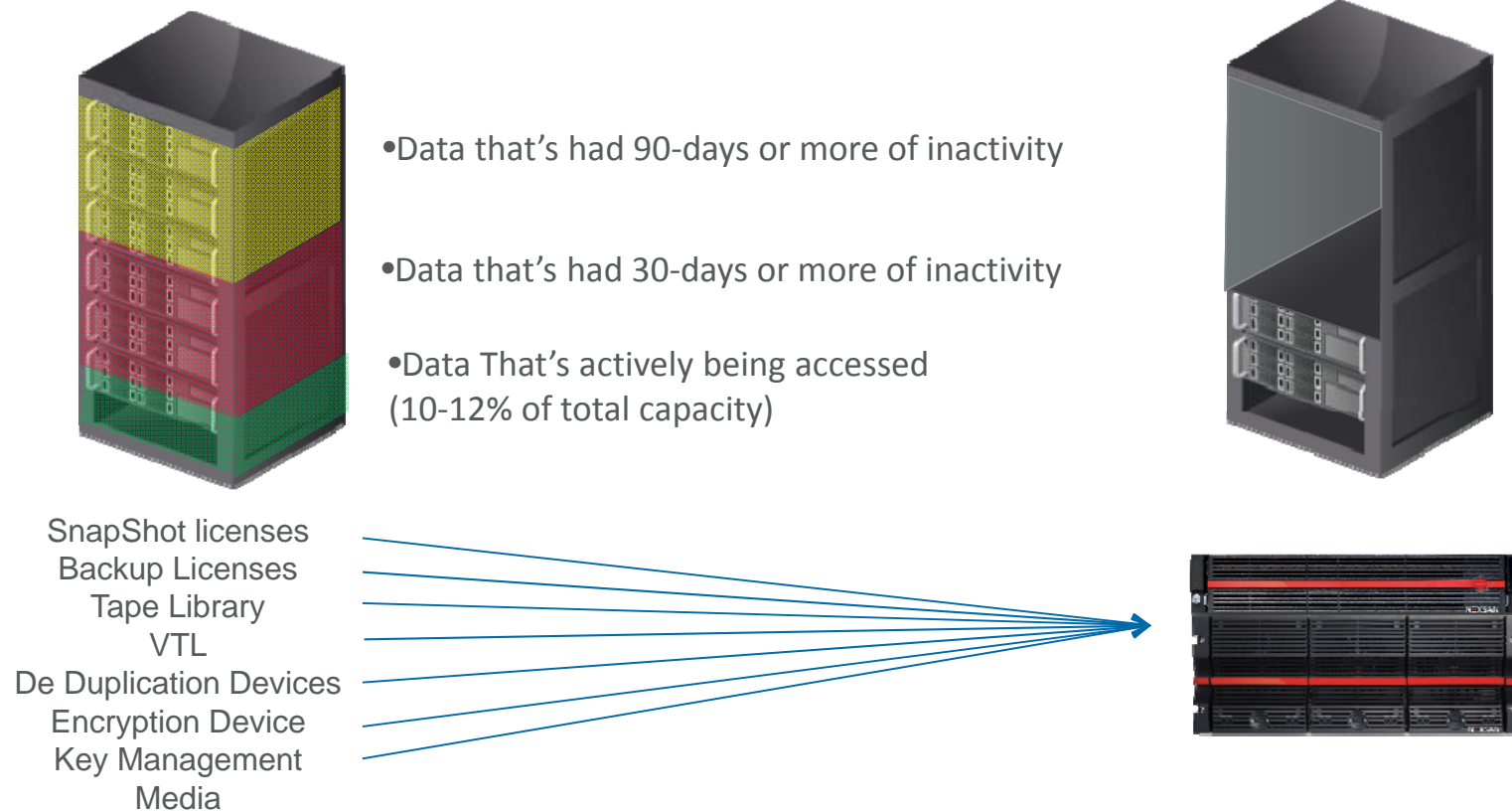
Archive: An archive refers to a single or a collection of historical records specifically selected for long-term retention and future reference.



Key Assureon Capability

Storage Optimization

Save big by Optimizing Tier-1 Capacity



Reduce total Tier-1 and 90% of backup dependency

Key Assureon Feature

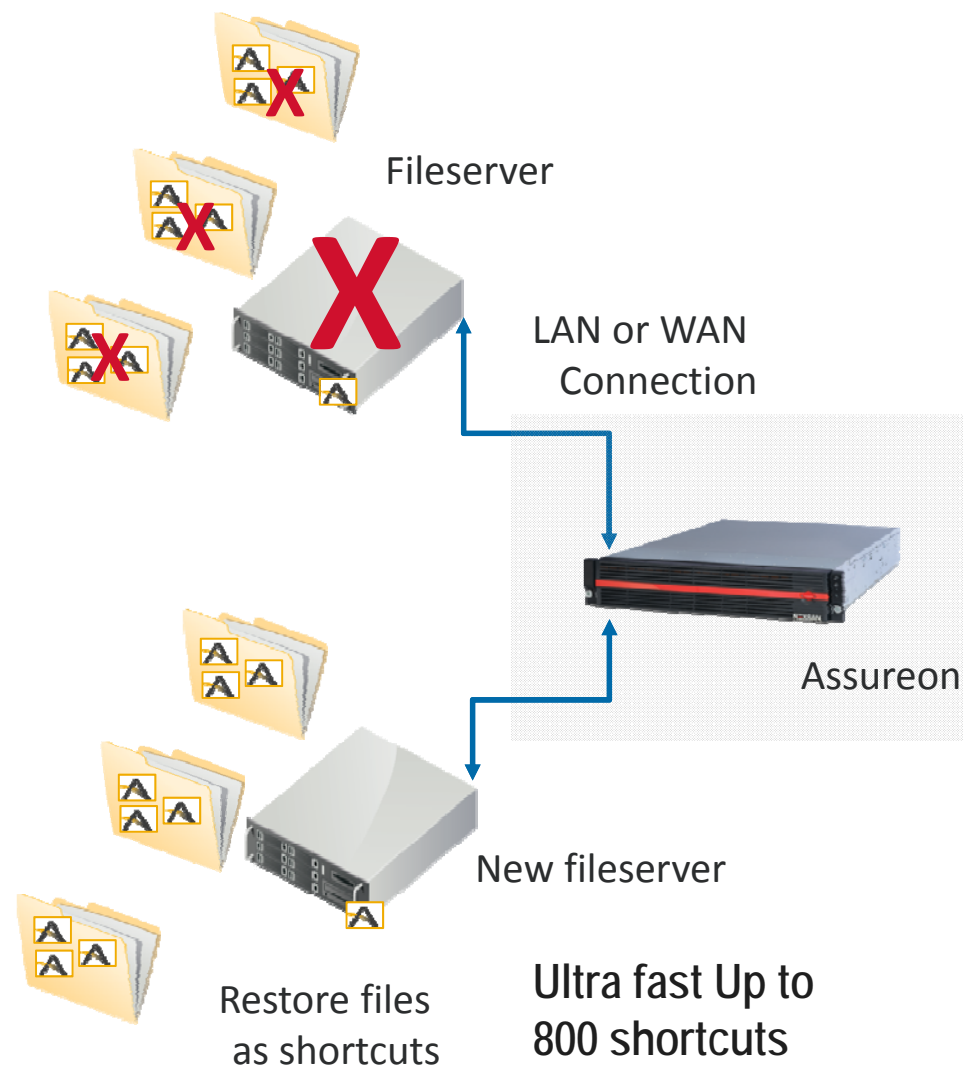
Ultra Fast Restore by TCP

Restoring by shortcuts

- If a server is lost, install the client on a different server and all files will immediately be available
- Turn on the Assureon client services
- Restore 4K shortcuts rather than 100GB files
- Reduce restore time from hours to minutes

LAN & WAN access

- Builds upon 1GbE, 10GbE or other Ethernet type connections



Key Assureon Feature

Instantaneous Restore / Recovery via IB

Zero disk footprint

- Files archived are deleted from the disk
- File is readily available to the user or application
- No file or shortcut on disk

Instantaneous restore/recovery

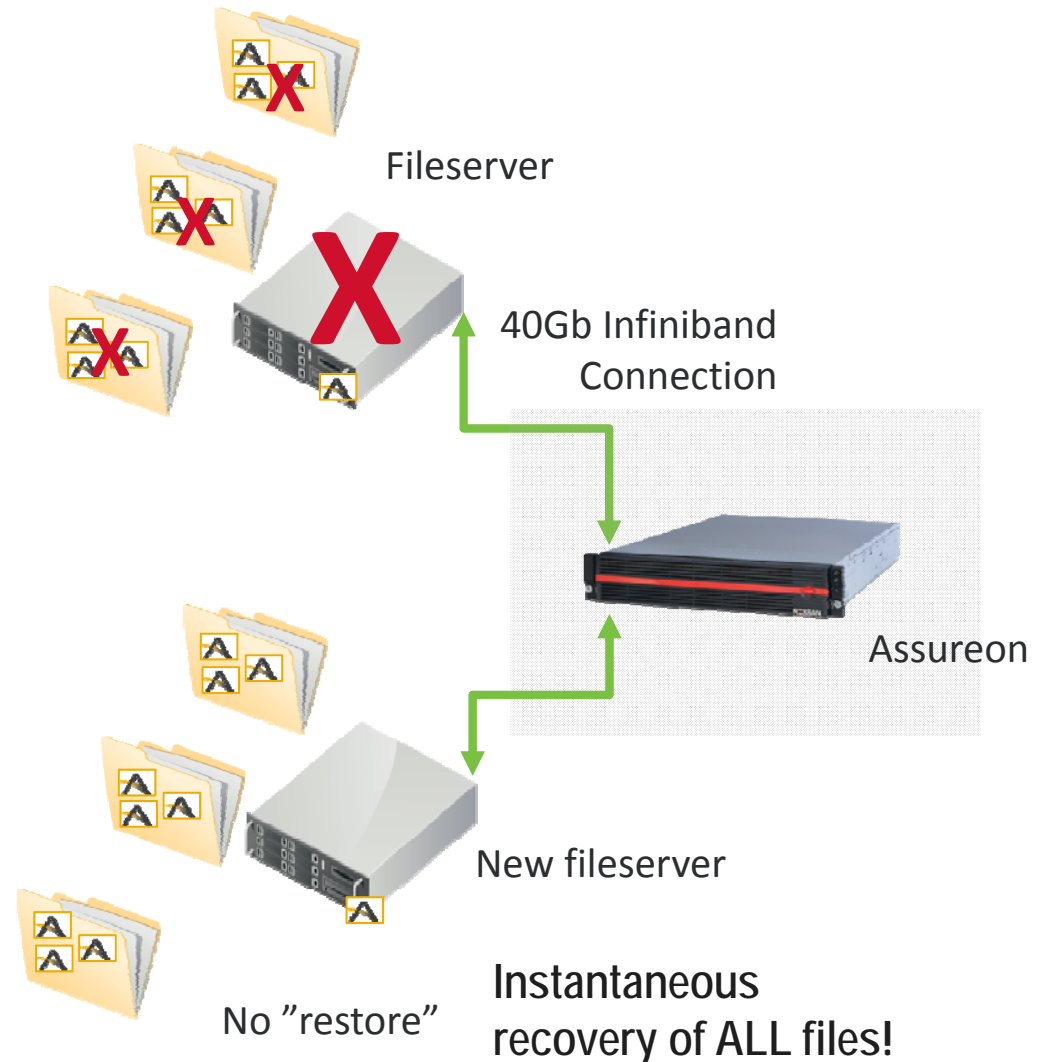
- All files are instantly available
- Turn on the Assureon client services
- If a server is lost, install the client on a different server and all files will immediately be available

High speed access

- Builds upon the 40Gbit/s Infiniband high-speed network

New in V8 – Infiniband + TCP Failover

- Builds upon the 40Gbit/s Infiniband high-speed network, uses 1GbE or 10GbE for failover



Key Assureon Feature

Redundant ingestion motors – Replicated Edges

Create redundancy on file servers

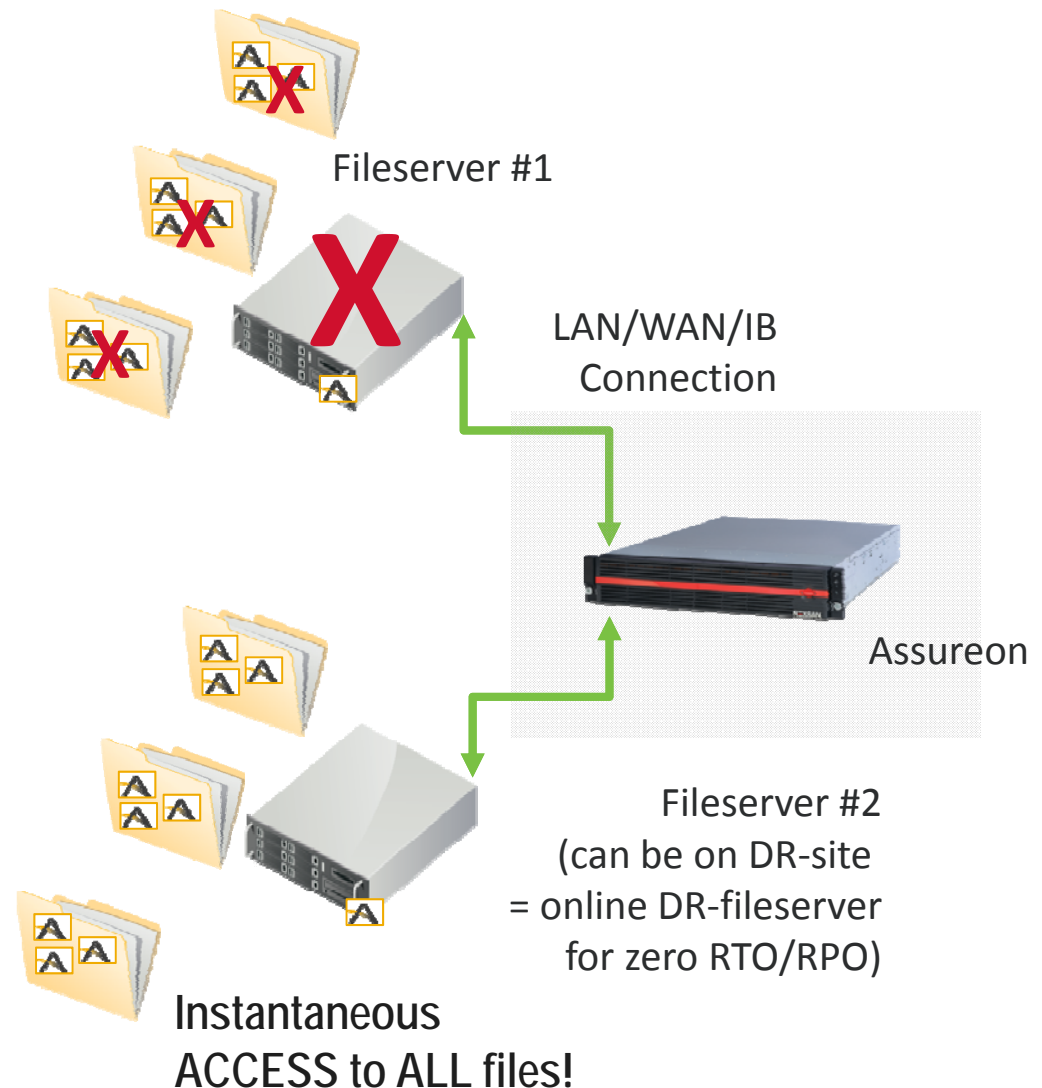
- All files ingested, will be replicated to other filserver instant
- Replicate as file or shortcut
- Provides failover on ingestion motors
- Using no storage on DR-site
- Virtual Shortcuts on Ethernet
- 1 to many relationship

Protocols

- You can choose 1GbE or 10GbE

Alternative – Cluster

- Use Windows File server cluster capability



Long Term Retention Policies

Guaranteed Retention



Use **guaranteed data class.subclass** to ensure data cannot be deleted before the end of the retention period you create and select.

Key Benefits:

- Keeps all versions, can't be deleted.
- Retention dates can be extended but not shortened.
- Once a file is expired it removes file access
 - can extend date to restore access, or
 - approve permanent deletion of files
- Great for corporate governance or compliance data
- Supports Legal Hold

Flexible Retention



Use **flexible data classifications** to set a policy which can be later shortened to delete files ahead of the end of original retention policy.

Key Benefits

- Keeps all versions, can't be deleted during the minimum retention period
- Retention dates can be extended OR shortened to delete a file earlier (as long as the minimum retention period is met)
- Can specify a maximum number of versions to keep after the minimum retention period e.g. a maximum of 2 or 3 versions
- Great for departmental and user files (storage optimization archiving)
- Supports Legal Hold

Hybrid Guaranteed followed by Flexible Retention



Use a longer minimum retention period with the flexible class.subclass to ensure all data is kept during the minimum retention period yet retains access for a longer, flexible period following the minimum.

Key Benefits

- Keeps all versions, can't be deleted during the minimum retention period, e.g. 7 years (similar to 7-year guaranteed except files kept after 7 yrs).
- Retention dates can be extended OR shortened to delete a file earlier (as long as the minimum retention period is met)
- The max versions = 0 ensures fake files can't be written to get rid of the real file. You must shorten retention date to delete files
- Great for valuable data that must be retained for x years, but currently you keep the data much longer
- Supports Legal Hold

Key Assureon Feature

Data Privacy

Access Audit Trail

- Unalterable audit trail for each file's life
- Logs every file access (who and when)
- Also logs unauthorized, denied attempts

Encryption of Files at Rest

- Each file individually encrypted with AES256 (same as top secret classified information)
- Annual key management subscription
- Files in flight between sites are encrypted



Key Assureon Feature

Energy Efficient

AUTO MAID®

AutoMAID 2.0 combined with Assureon's multiple virtual archives can save up to 60+% or more in power and cooling costs.

Nexsan's Ultra-Green Assureon Archive

- Assureon is architected to leverage Nexsan's AutoMAID 2.0
- No other archive is as energy efficient

Save up to 60% or more in energy costs

- Set policies and Assureon handles the rest
- Saves energy and cooling costs

MAID	MAID Action	Savings	Recovery
Level 1	Unload Heads	15% to 20%	Sub-second
Level 2	Unload Heads, Slow to 4000 RPM	35% to 45%	15 seconds
Level 3	Stops spinning (sleep mode; powered on)	60% to 75%	30-45 seconds

The Assureon Advantage

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Where Assureon excels

- Important and unique features

Privacy

Encryption of data in flight
Encryption of individual files – with a cloud based escrow service
Unalterable audit trail for each files life

Multi Tenancy

Built for Cloud services and Multi Tenancy – private or public
Ability to have remote sites access the archive

Performance

Virtual Shortcuts (RDMA access)
Infiniband option for high-speed performance
Remote restore via shortcuts

Integrity

Cyclic integrity check of all files (digital fingerprint validation)
Cyclic audit against the serial numbers of all files
Chain of custody for each file
We use two hashing algorithms at source for all our ingested files

Assureon Specialities

We develop and produce our own storage devices – it is the IP of Nexsan (Not from 3rd party vendors)
Ease of use, very high ROI
No API required
Assureon client software to move files in and out of the archive while leaving a shortcut behind
Virtual Shortcuts on both IB and TCP now!
We will support your system for 7 years!

Licensing

No hidden license costs, very simple licensing model

Efficient

Automaidd power-saving feature on storage

Compliance

Access permissions easily synchronized with AD or Certs
Legal Hold
Multiple enforceable data policies

Storage Optimization

Single instance storage (file level deduplication)
No backup required for data inside the archive
Scalable to Multi-PB
Compression
Built in encrypted replication

Where does Assureon excel? – Part 2

– What do we do particularly well

- Assureon can ensure data integrity in 2 (4) copies while others cannot.
- Our patented Dual-Cryptographic hash of every file **at the source** coupled with Serialization and Integrity Audit provides integrity other solutions do not come close to.
- It is true, the underlying RAID of Assureon (like many others) is based on RAID-6. Typical drive failure rate in the industry is 4%, we operate with a **failure rate of 0,33%**. We build our solution on top of this.
- The realtime auditing and data self-healing of Assureon protect against this, on top of the RAID subsystem, providing a world class archiving system.
- Assureon is able to deliver data in speeds up **to 95-105% of the application server** running without any archiving functions active. No other true archiving solutions can do that.
- Assureon is very fast, High Speed Assureon is Ultra-Fast.

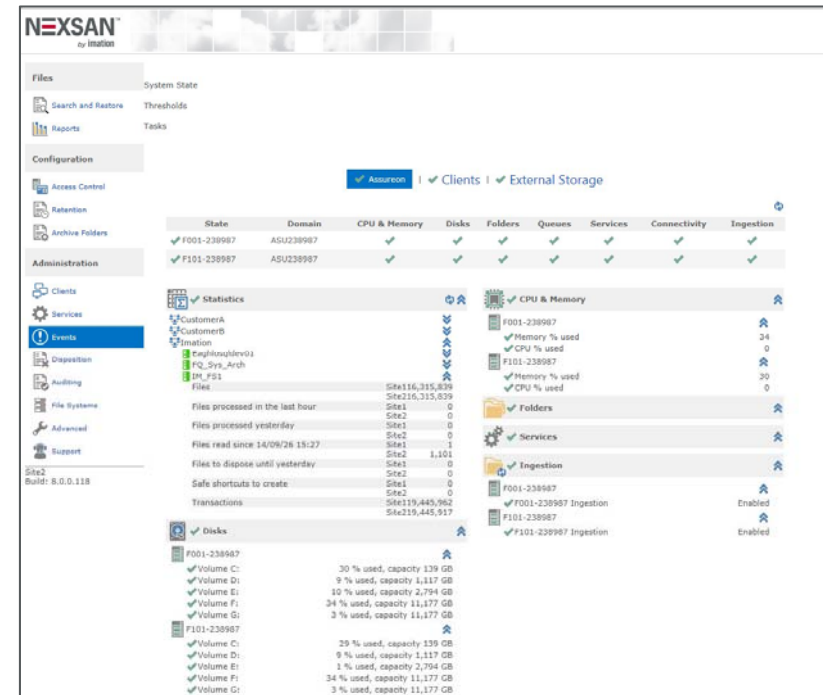
How does Assureon differ?

- The roads we chose!

- We make two copies of objects and protect these for integrity. We do not make multiple copies and hope integrity is good.
- We self-heal corrupted objects automatically.
- We use High Speed (IB) for ingestion of larger objects, to ensure timely ingestion and retrieval.
- We own the IP of our storage, compliant to the firmware level.
- We have chosen only to have proven technical experts in our support staff

Assureon 8 is out – Highlights!!

- Call home
- Automated upgrades
- Virtual shortcuts over TCP
- Single pane of glass server-side management of the clients
- Additional and enhanced system statistics
- Multiple synchronization jobs
- Enhanced Search options
- New reporting framework.
- Software upgrade via support. It's free.
- New enhanced WebGUI experience
- Daily Summary Reports





THANK YOU!

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Behind the scenes

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Assureon Processing Node

- Intel based 2U Node
- Flexible Building Block
- Windows 2008 R2
 - Contains Lifecycle Management Services
- Assureon System Software
- IPMI...



Internal or External Storage

Assureon Processing Node



Assureon Storage Node

SX/SXR
(External Storage)

Assureon Processing Node



AX/AXR
NX/NXR
(Internal Storage)

About External Storage

- E-Series
 - E-18 (18 Drives)
 - E-48 (48 Drives)
 - E-60 (60 Drives)

Assureon Processing Node



Assureon Storage Node

- Must be configured from Assureon Processing Node

E-Series VT



- Leader in dense storage for more than 10 years
- 5th generation very dense block storage
- Flexible building block
- 60 x 3,5" with 35 degrees ambient
- Designing and building our own controllers for +10 years
- Metalwork, PCB design, firmware = 100% Nexsan IP.

Nexsan Customer in medical environment

Audrain Hospital **AGFA**
 ACS Marin Medical Center **McKESSON**
 Atlantic Medical Imaging **GE Healthcare**
 AIM Healthcare, Inc.
 American Heart Association
 Alamo Physicians Services
 Athens Regional Medical Center **McKESSON**
 Austin Diagnostic Clinic
 Baptist Hospital of Miami
 Barnes Jewish Saint Peters Hospital **McKESSON**
 Beverley Hospital **GE Healthcare**
 Broadstone Memorial **McKESSON**
 Blue Shield
 Butler Health System
 Bradford Hospital
 Carlisle Regional Medical Center **AGFA**
 Colquitt Regional Hospital
 Canadian Occupational Health & Safety
 Central Carolina Hospital **McKESSON**
 Countess of Chester Hospital - UK **McKESSON**
 Center for Disease Control
 Chattanooga Ortho Clinic **GE Healthcare**
 Cleveland Clinic Foundation
 Contra Costa Hospital **McKESSON AGFA**
 Community Health Systems **McKESSON**
 CHS - Kosciusko **McKESSON**
 CHS- Mountain View **McKESSON**
 CHLSI-St Francis **AGFA**
 CHLSI-St Catherine **AGFA**
 Castel Franco Hospital **GE Healthcare**
 Dept. of Veterans Affairs Medical Ctr-Ok **AGFA**
 Desert Springs Hospital Medical Center
 East Alabama Hospital **McKESSON**
 Eisenhower Hospital - Army **AGFA**
 East Cooper Medical Center **McKESSON**

Frisbee Hospital **McKESSON**
 Greenetch LLC **GE Healthcare**
 Hartford Hospital Institute of Neuroscience
 Heart Hospital of Austin
 Hackensack Radiology **AGFA**
 Hollywood Presbyterian Medical Center
 Howard Hughes Medical Institute
 Health Management Associates **GE Healthcare**
 Ingalls Hospital
 Institute of Surgical Research - US Army
 JTFCAPMED **AGFA**
 Kaiser Permanente (8 +locations) **McKESSON**
 Lewiston Hospital **McKESSON**
 Lenox Hill Radiology **GE Healthcare**
 Laredo Doctors Radiology **GE Healthcare**
 Leeds General Hospital - UK **McKESSON**
 Macmillian Cancer Support
 MacDill Air Force Base Hospital
 Manatee Memorial Hospital & Health Sys
 Manhattan Diagnostic Radiology
 Metropolitan Diagnostics Imaging **GE Healthcare**
 Marie Curie Memorial Foundation
 Mary Imogene Bassett Hospital
 Mass General Hospital
 McKesson Automation
 MeadWestvaco Healthcare
 Methodist McKinney Hospital **McKESSON**
 Medical College of Wisconsin
 Miami Valley Hospital
 Mission Community Hospital
 Missouri Baptist Medical Center
 Molnlycke Healthcare AB
 NY Medical Radiology **GE Healthcare**
 Northwest Memorial Hospital **SIEMENS**
 Mount Sinai Hospital

Oak Lawn Hospital **GE Healthcare**
 Oklahoma Veteran's Hospital **AGFA**
 Ohio Valley Medical Center **McKESSON**
 Piedmont Medical Center **McKESSON**
 Pleasant Valley Medical **McKESSON**
 Palmdale Medical Center **GE Healthcare**
 Regional Radiology Center **McKESSON**
 Riverside Medical **AGFA**
 Reedsburg Hospital **AGFA**
 Royal Bolton Hospital **McKESSON**
 Royal College of Nursing
 Radiology West **McKESSON**
 Saddleback Memorial Medical Center
 Saint Mary's Hospital
 St. Francis Hospital **McKESSON**
 San Diego UC Medical Center **AGFA**
 Salisbury District Hospital **McKESSON**
 Southwest Regional Mississippi **McKESSON**
 SouthCrest Hospital **AGFA**
 Siemens Schweiz
 St Luke's
 South Jersey Healthcare
 Sonterra Medical Management
 St. Georges Hospital - UK **McKESSON**
 St. Jude Children's Research Hospital
 Summit Healthcare **McKESSON**
 UCSD Medical Center **AGFA**
 Tift County Hospital **McKESSON**
 Tuoro Infirmary **AGFA**
 Tenet Hospitals (22 locations) **McKESSON**
 Universal Health Services, Inc. (3 hospitals)
 Warrington Hospital - UK **McKESSON**
 Whitson Hospital - UK **McKESSON**
 Yeoh & Muranaka Radiology **GE Healthcare**
 VISN 20 - Veterans **AGFA**

Our Models

NEXSAN E18V
NEXSAN E18XV



NEXSAN E32V
NEXSAN E32XV



NEXSAN E48VT
NEXSAN E48XV



NEXSAN E60VT
NEXSAN E60XV



	2U, 18 Drives	2U, 32 Drives	4U, 48 Drives	4U, 60 Drives
Drives	1 / 2 / 3 / 4 / 6 TB SAS	-	1 / 2 / 3 / 4 / 6 TB SAS	
	900 / 1200 GB 10K SAS	600 / 900 / 1200 GB 10K SAS	900 / 1200 GB 10K SAS	
	450 / 600 GB 15K SAS	-	450 / 600 GB 15K SAS	
	200 / 400 / 800 GB SSD	200 / 400 / 800 GB SSD	200 / 400 / 800 GB SSD	
In-Chassis	108 TB	38.4 TB	288 TB	360 TB
with 1 Expansion	216 TB	76.8 TB	576 TB	720 TB
with 2 Expansions	324 TB	115.2 TB	864 TB	1.08 PB
I/O	(4) 1Gb iSCSI & (0-4) 1Gb iSCSI (0-4) 8Gb FC (0-4) 16Gb FC (0-4) 10Gb iSCSI (0-4) 6Gb SAS(x4)		<u>V</u> (4) 1Gb iSCSI & (0-4) 1Gb iSCSI or (0-4) 8Gb FC or (0-4) 16Gb FC or (0-4) 10Gb iSCSI or (0-4) 6Gb SAS(x4)	<u>VT</u> (4) 1Gb iSCSI & (0-8) 1Gb iSCSI or (0-8) 8Gb FC or (0-8) 16Gb FC or (0-8) 10Gb iSCSI or (0-8) 6Gb SAS(x4)

