



IBM System Storage N series

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IBM System Storage

Agenda

- Intro: what is NAS ?
- IBM / NetApp agreement
- N series portfolio
- Positioning with DS and xSeries Storage Servers
- Solution areas
- Competition

IBM and Network Appliance Alliance Overview

In April 2005, IBM and Network Appliance announced a strategic storage relationship to drive information on demand solutions and to expand IBM's portfolio of storage solutions.

The relationship includes:

- IBM and NetApp has entered into an OEM agreement that will enable IBM to sell IBM branded solutions including hardware and software
- IBM Tivoli Storage Manager will become a preferred backup and recovery solution for NetApp products
- In addition, NetApp will position IBM as its preferred supplier of tape systems.
- Finally, the two companies are exploring additional strategic opportunities.



NetApp Today

- Year founded: 1992
- Number of Employees: 3,900+
- Revenues: \$1.6 billion (FY2005)
- Member of S&P 500
- Member of Nasdaq 100
- Inaugural member of Fortune e-50
- Worldwide Offices: 89
- Worldwide Installations: almost 60,000



Strategic Value Of Alliance To IBM

- N series products will allow IBM to fill critical gaps in our current portfolio.
- Concurrently supports NAS, IP SAN, and FC SAN environments
- Our customers have requested this technology to help meet their storage networking needs.
- Portfolio serves three highly desired environments from single platform
 - ▶ High-Performance, mission-critical data environments
 - ▶ Archive and data retention environments
 - ▶ Most important, disaster recovery site missions
- IBM and NetApp are working together and future technologies that best meet our customers needs.



Whitespace and Opportunities

Why did IBM and NetApp Enter into this Alliance?

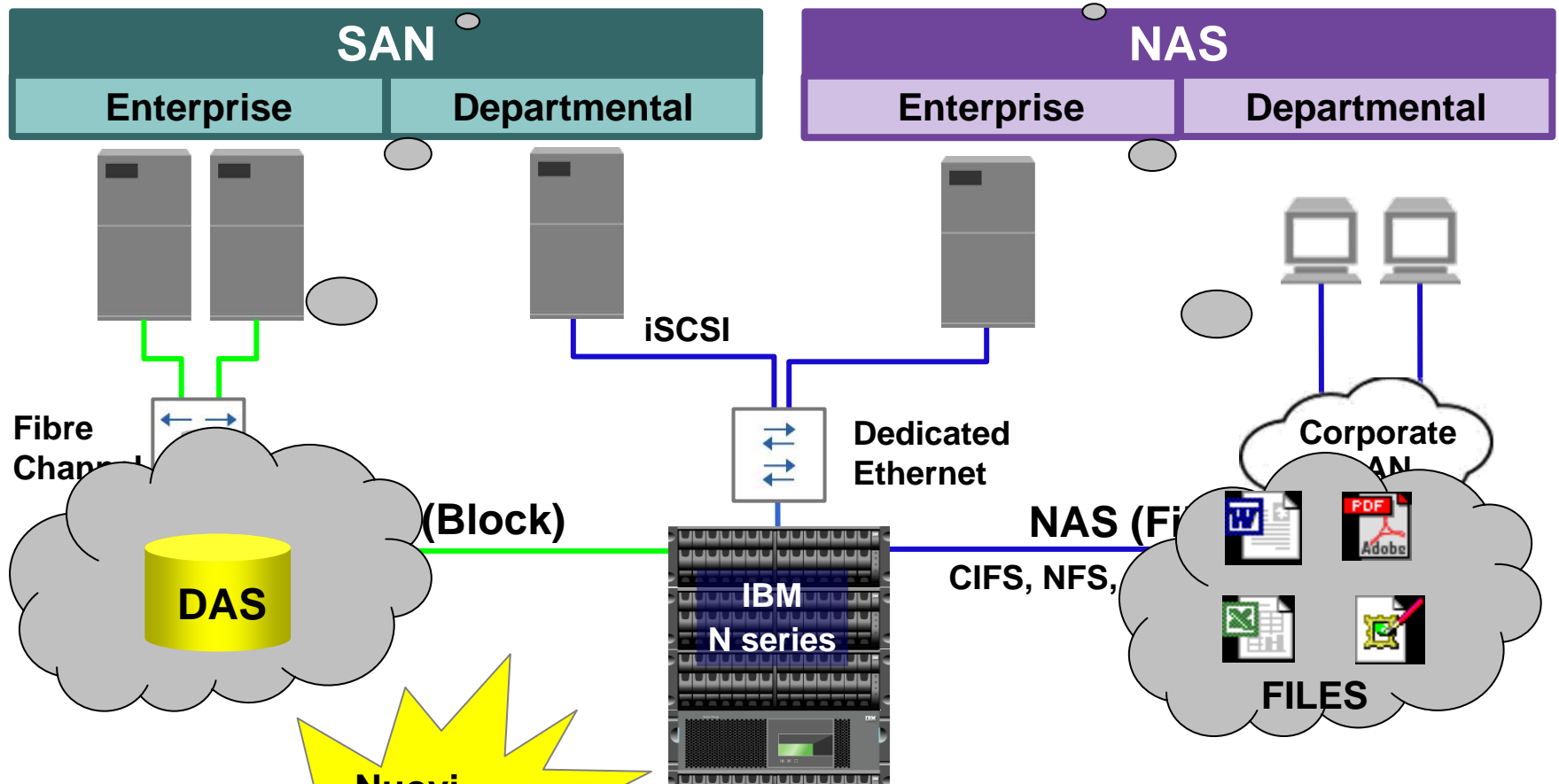
- Increase market share
- NetApp Beats EMC 80% of the time
- Target incremental revenue - Identify whitespace in both Geo and Sectors (Verticals)
- Drive teaming between IBM and NetApp at the district level
- Collaborate with the teams before and after registration

Key Business Opportunities

- Windows and Exchange Consolidation
- Data Retention and Email Archive
- Remote Office / Distributed Enterprise
- SAP – Playbook and BCS
- Public (state and local government), Healthcare, Automotive, Financial Services (retail bank, insurance) and Retail Sectors
- SO Accounts

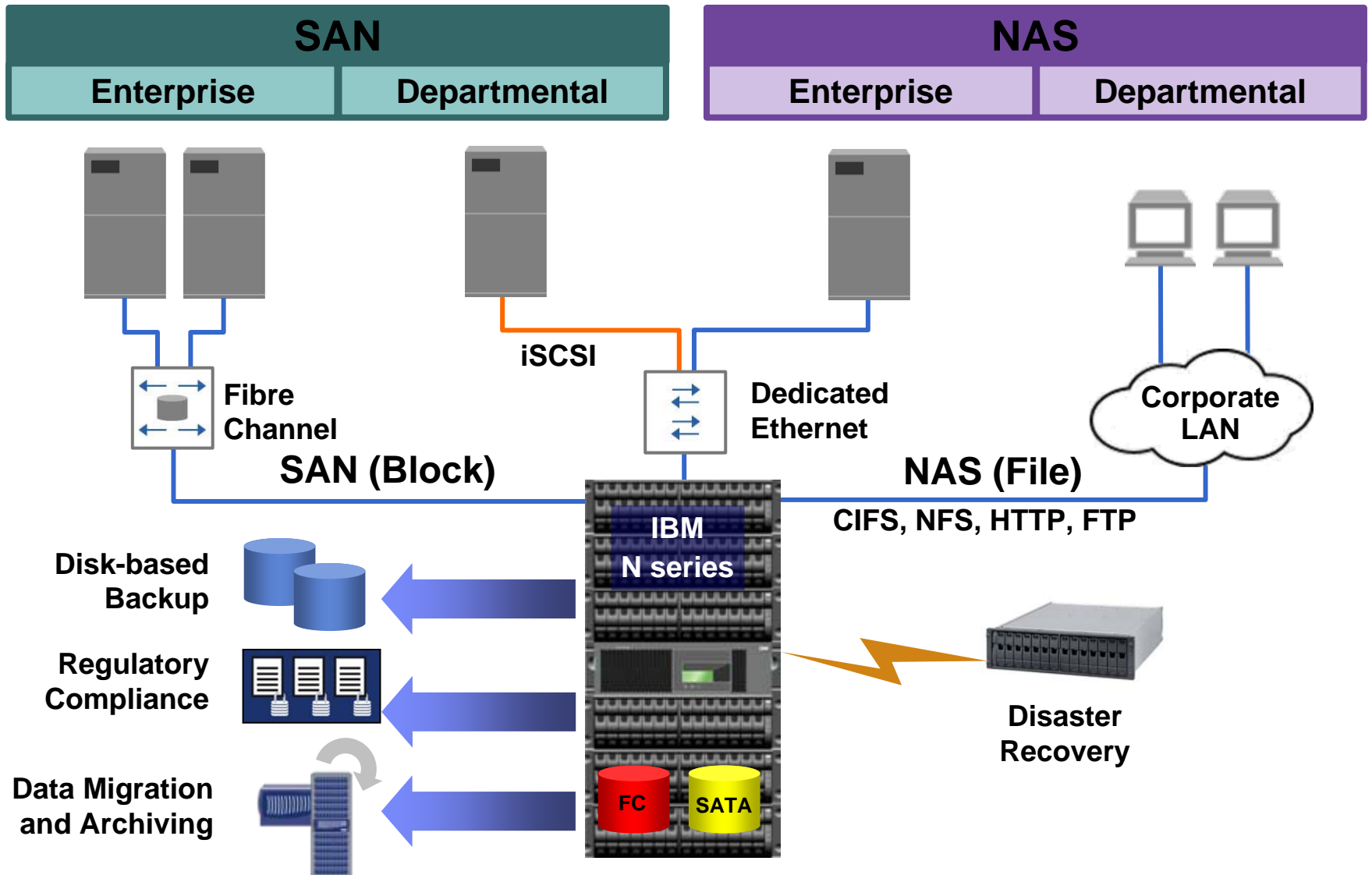


Serie N: consolidamento storage distribuito



Nuovi modelli "gateway"

IBM System Storage N Series: Unified Storage



IBM System Storage N series Overview

Entry Level appliance

FAS270

Midrange appliances & gateways

N5200G



V3020
FAS3020

N5500G



V3050
FAS3050

N5200



84TB (non-clustered)
84TB (clustered)

N5500



168TB (non-clustered)
168TB (clustered)

Enterprise appliances & gateways

N7600G



V6030
FAS6030

N7800G



V6070
FAS6070

N7600



420TB (non-clustered)
420TB (clustered)

N7800



504TB (non-clustered)
504TB (clustered)

N3700



16TB (non-clustered)
16TB (clustered)

All systems utilize the same:

- Network Protocols (NAS, iSCSI, FC SAN)
- Operating system: Data ONTAP
- System management tools
- Storage management tools
- RAID levels
- High availability features
- Disk Drives (FC & SATA)
- Advanced software features and functions*

* Some features are not available with the gateway models

Advanced Features Provide Total TCO Protection

Network Access Protocols

- **CIFS** – Windows client & server attached to storage via IP network utilizing file system protocols
- **NFS** – UNIX/Linux client & server attached to storage via IP network utilizing file system protocols
- **iSCSI** – Windows/UNIX & Linux server attached to storage via IP network utilizing block I/O protocols
- **FCP** – Windows/UNIX & Linux server attached to storage via fiber channel network utilizing block protocols

Data protection & Business Continuity

- **On board copy services** via Snapshot & SnapRestore – virtual file & volume copy
- **Outboard copy services** via SnapVault, SnapMirror, SyncMirror
- **Double parity RAID** provides enhanced data protection for SATA drives
- **Cluster Failover** – between redundant nodes
- **non-erasable non-rewritable data protection** with SnapLock & LockVault

System tools, Usability Aids, Provisioning

- **Overall system monitoring** and management with FilerView
- SnapManager – **Exchange & SQL environments**
- SnapDrive – usability for block I/O environments
- FlexClone – **database cloning**
- FlexVol – **Thin Provisioning**
- MultiStore – **Partitioning**

Solutions

- **E-mail archive**
- **MS Exchange, SQL & Oracle consolidations**
- **Storage consolidation**
- **File Server consolidation**
- **Catia migrations**
- **Unified storage for Infrastructure Simplification**
- **Corporate Compliancy**
- **Information Lifecycle Management**

IBM Disk Storage Solutions

Enterprise Storage
Continuum

DS8000 series

FC
FATA

DS6000 series




N7000 series






Departmental
Mid-range Storage

DS4800

FC
SATA




DS4700

N5000 series

N3700

FC
SATA

Entry Workgroup
Storage

DS300

SCSI

DS400

EXP400
EXP400

DS4200

S-ATA





x226

SCSI
SATA

x206




2006 IBM NAS: Positioning and Sell Strategy

System x NAS and SystemStorage NAS products

xSeries Storage Server

- Microsoft Storage Server OS
- Rack, Tower and Blade offerings
- 640 GB or 1TB SATA or SCSI
- Unlimited Client Licenses
- BladeCenter HS20 gateway
- H/S redundant power option
- ServeRAID support

TotalStorage N3700 adds:

- Enterprise, retail capable
- Up to 16 TB
- Two optical FC ports for tape attachment
- Four 1Gbps Ethernet
- H/S redundant power option
- Operating System ONTAP

TotalStorage N5200 adds:

- Up to 50 TB
- Eight 2Gbps Fiber Channel
- Eight 1Gbps Ethernet
- Fiber Channel & SATA HDD
- 6 PCI-X slots for fiber HBA's
- Midrange to small enterprise

Option up with

- 1.2 TB Storage
- Tape Backup
- Redundant power

Storage Server



N3700



Sell xSeries NAS for

- Significant savings compared with rolling out general windows based file servers

Sell N3700

- Enables cross-platform data access for Microsoft Windows, UNIX and Linux environments

N5200



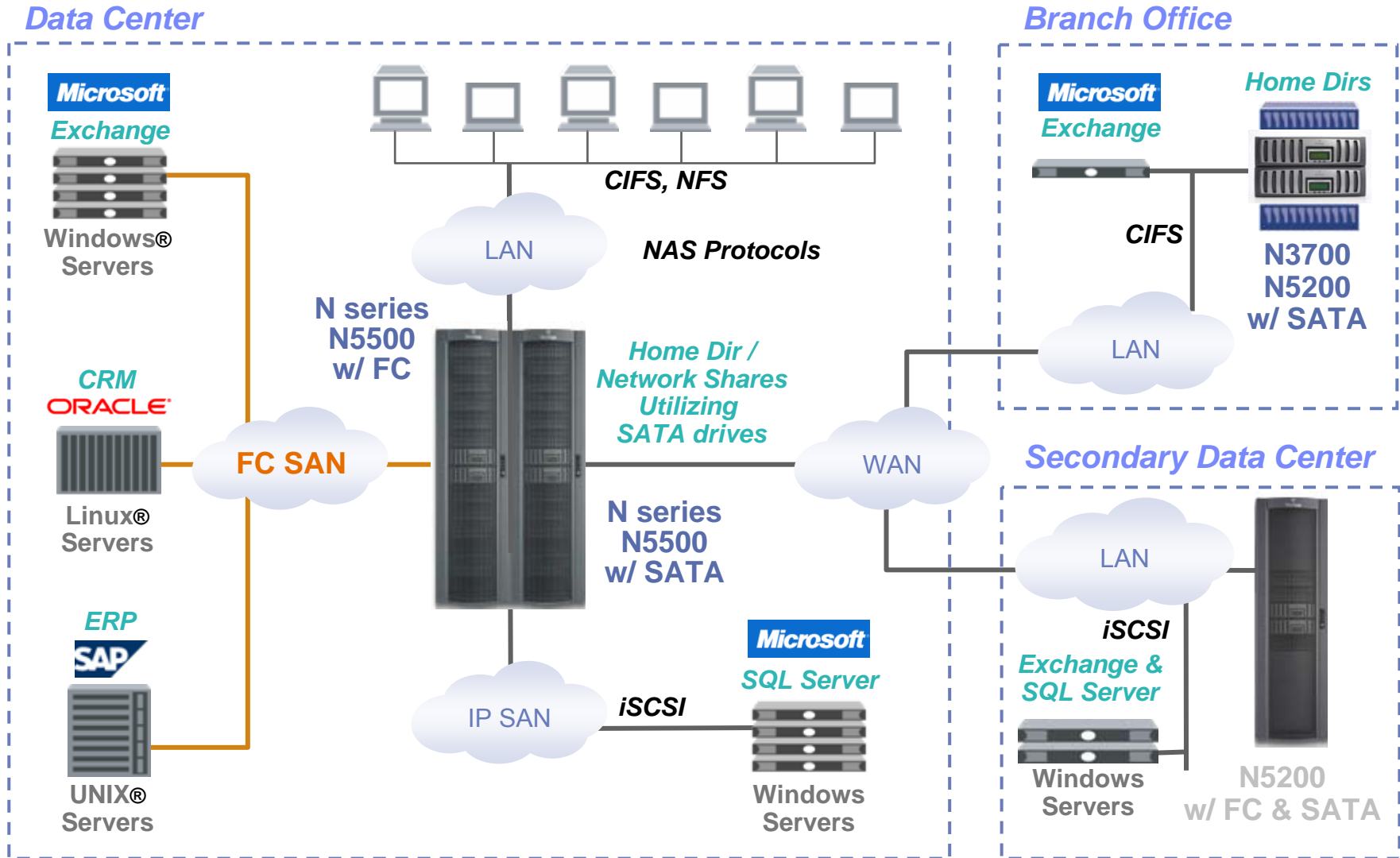
Price range

\$2,549 -\$8,029

\$50,000

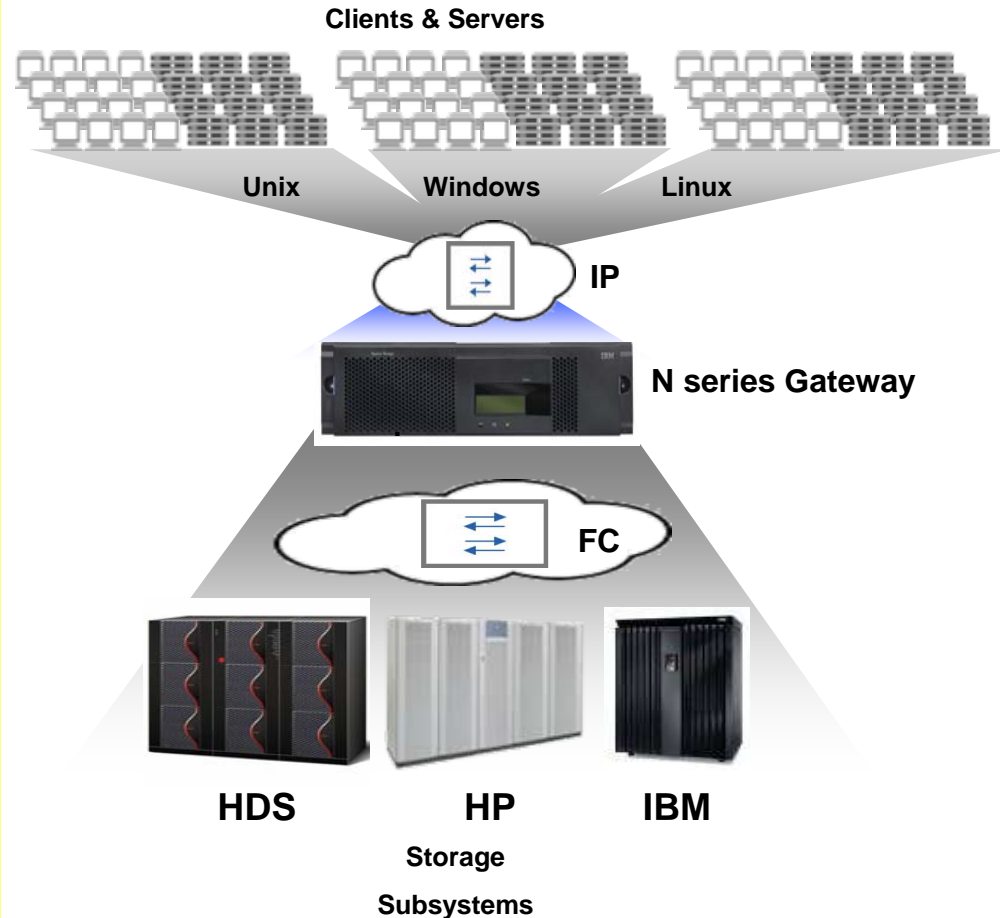
\$60,000

Dove vendere IBM Nseries: ambienti molto eterogenei



Why Gateway vs. General Purpose File Server

- ✓ **A single Gateway supports Unix, Linux and Windows file protocols**
 - Potentially reducing the number of servers required for accessing SAN storage in mixed protocol environments
- ✓ **Connecting small inexpensive servers to premium priced SAN storage is very costly.**
 - FC HBAs, FC switch ports... costs could exceed the actual cost of server
- ✓ **A single Gateway extends the reach of SAN storage to many servers attached to an IP network**
 - Potentially reducing overall connection costs
 - Allowing access to SAN storage at extended distances
- ✓ **A Gateway provides functionality of series technology to other vendor storage subsystems** N
- ✓ **A Gateway provides increased protection investment in SAN storage by increasing SAN utilization & accessibility**



[Link to Interoperability Matrix on Web Site:](#)

Dove vendere IBM Nseries Soluzioni di E-mail archiving

The IBM N series Exchange Consolidation and Archive Solution helps . . .

- ✓ **Simplify Exchange server and storage management** by consolidating Exchange storage from many different servers onto fewer high performance N series storage systems
- ✓ **Improve storage utilization** by sharing available capacity across all Exchange servers
- ✓ **Reduce costs for e-mail storage** by using archive technologies to move older e-mails and attachments to less costly SATA disk drives
- ✓ **Exploit existing skills** by using low-cost IP (Ethernet) networking
- ✓ **Address requirements for e-mail retention** by providing non-erasable, non-rewritable disk storage
- ✓ **Enhance Exchange availability** using nearly instant backup and recovery capabilities tightly integrated with Microsoft Exchange
- ✓ **Improve service to Exchange users** by enabling rapid and efficient recovery of individual mailboxes or even individual messages
- ✓ **Improve Exchange user productivity** by eliminating the need for manual management of e-mail quotas and by making older e-mails more accessible.



Dove vendere IBM Nseries

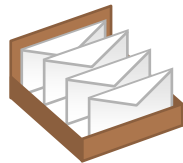
Data retention: SnapLock feature for WORM protection

Data Types

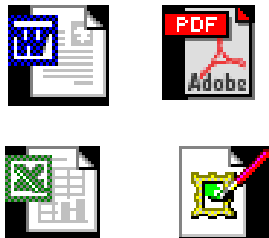
Structured



Semi-structured



Unstructured



Storage Solutions

Data Permanence

Security / Privacy

SnapLock™



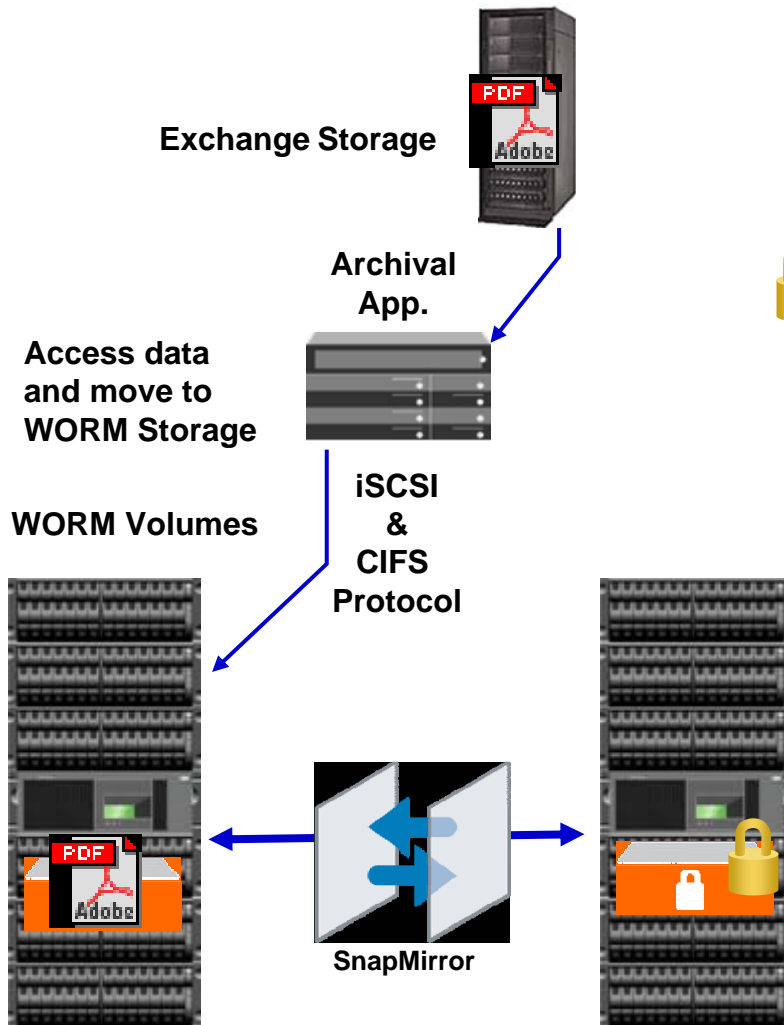
LockVault™





RAID-DP, Block Checksums, RAID Scrubs, Write Verification

Access Controls
Authentication
Audit Logging
Encryption
Secure Deletion
Role Separation

WORM Data Protection with SnapLock™ and SnapMirror™

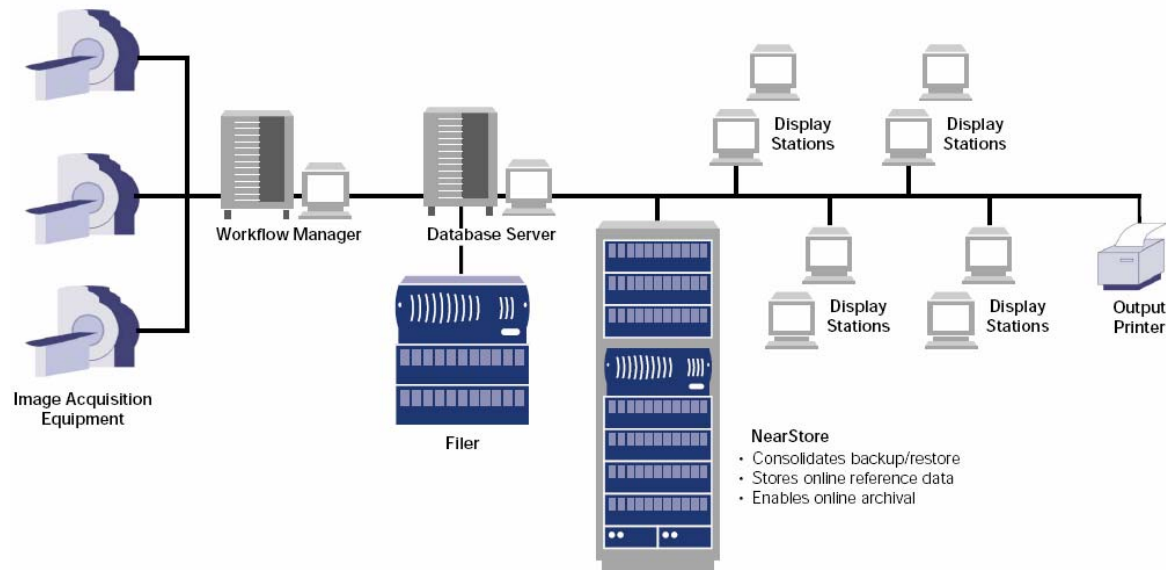


- Archive files to SnapLock volume via CIFS
- Set each file's expiration date **Dec 12th 2007**
- Mark files "read only" 
- No alterations, overwrites or deletions possible until file expiration (tamper proof ComplianceClock™)
- Copy WORM protected archive to second site
- Retention protection on the archive storage, original date stays with file
-  Create SnapLock Volume

Dec 12th 2007

Dove vendere IBM Nseries Soluzioni RIS/PACS per Medical Imaging

- **The Challenge: Selecting a Cost-Effective PACS Data Storage Component**
 - ▶ The data storage component of PACS solutions plays a key role in determining the cost and effectiveness of the total offering
 - ▶ The right data storage solution can help lower infrastructure costs, simplify the management of data, and give unmatched flexibility in deploying the system in the IT environments
- **The Solution: IBM N series PACS Storage Solutions**
 - ▶ IBM Nseries storage solutions deliver all those benefits and more. In addition to offering fast, simple, and reliable data storage, a Network Appliance solution reduces the total cost of ownership (TCO)



Strategies for Beating EMC with N series Value

- Focus on benefits of **Unified Storage**
 - NAS for file level access across familiar IP network improves sharing capabilities and disk utilization
 - iSCSI over IP improves management efficiencies
 - FC SAN option gives maximum solution versatility
- Look for **multi-protocol consolidation** - requires EMC to quote multiple systems
- Position **remote mirroring** – EMC's SRDF is expensive and complex
- Focus on reliable and consistent verifiable online backups
- Incremental backup of changed blocks reduces storage needed for fulls
- Use disk as secondary storage before going to tape (FC and SATA drives supported on all systems)
- Demo SnapDrive to show ease of provisioning and protecting Windows data
- Meet **compliance requirements** for remote office data by backing up centrally
 - Apply corporate policies across the remote environments
- Jointly **sell with TSM and tape** to grow the business

Key Differentiators of N series vs. EMC

- Unified Storage
 - Only solution offering simultaneous FCP, iSCSI, NFS, and CIFS access to data
- Dynamic Storage Provisioning
 - Expand and shrink capacity when needed with no downtime
- Snapshot
 - More copies with no performance impact
- Rapid Recovery
 - System and database recovery in minutes
 - Single cost-effective mirroring solution across all platforms
- Data Retention
 - Enabled with a SnapLock license rather than a separate system
- RAID-DP
 - Mitigates the risk of data loss inherent in SATA drives without the overhead of a full mirror
- SnapDrive
 - Integrates data management into Windows administration environment
- Backups
 - Decrease network bandwidth utilization – transmit incremental changes only between backups
 - Backup data is viewable and usable, and allows end users to restore directly from backup storage

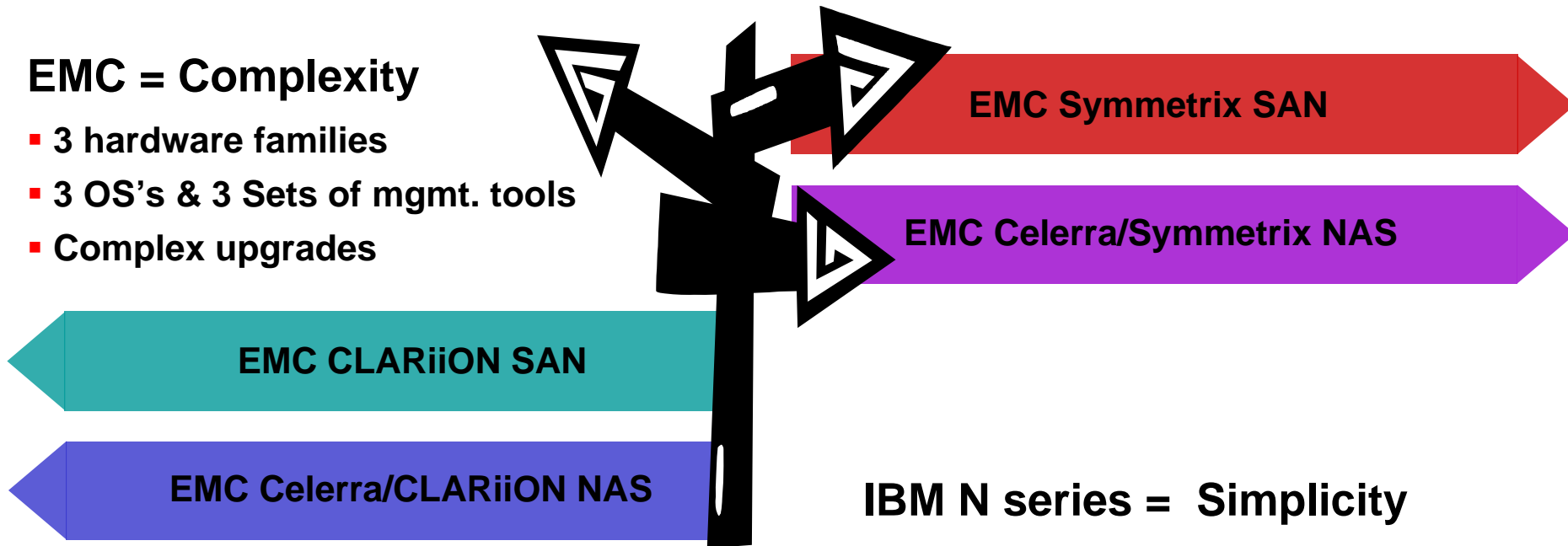
N Series Kill Points

N Series	EMC
<p>Unified Storage Architecture A single hardware & software platform for NAS, IP SAN, FC SAN, Data Retention, Disk-based Backup</p>	<ul style="list-style-type: none"> ▪ 6 dissimilar hardware platforms ▪ 7 dissimilar operating systems ▪ 7 dissimilar management GUI's ▪ Dissimilar DR, BC, ILM strategies
<p>Investment Protection – software and enclosures are identical on all models for upgradeability</p>	<ul style="list-style-type: none"> ▪ Limited upgradeability within family lines ▪ Software is different across offerings
<p>Performance Benchmarking is done using a real-world environment with RAID-DP.</p> <ul style="list-style-type: none"> ▪ http://www.veritest.com/clients/reports/netapp/default.asp, ▪ http://www.netapp.com/tech_library/ftp/analyst/ar1027.pdf 	<ul style="list-style-type: none"> ▪ Performance claims are based on RAID 0. ▪ RAID 0 implies ZERO data protection and yields false / unrealistic / unusable environments
<p>Filers operate in Primary/Primary Mode Both filers in a clustered environment can both read and write to storage</p>	<p>EMC can cluster more than two filers (data movers) in a single system running in Primary/Stand By mode. In these clustered environments, only one data movers can write to storage, all the other data movers within a cluster can ONLY READ from storage. Ask the customer if EMC is only charging them ½ the price of these data movers since they are only capable of performing ½ the function. This causes excessive costs for ½ the real need.</p>
<p>RAID-DP offers double parity data protection Extremely desirable in ATA drive environments where drive reliability is less and bit rate errors are higher than traditional FC drive environments.</p>	<p>EMC does not have double parity RAID for their ATA solutions. IBM N series, NetApp and Hitachi are the only companies implementing double parity RAID at this time.</p>
<p>Copy Services</p> <ul style="list-style-type: none"> ▪ SnapShot – onboard copy services – Unique in the industry, nothing like it in performance category due to WAFL design ▪ Reference: Hot link to reference material ▪ SnapMirror – Sync, Async, Semi-Sync 	<ul style="list-style-type: none"> ▪ SnapSure – Performs a SnapShot-like (FlashCopy) function. During execution of their SnapSure function, system performance drops 60% compared to N series SnapShot. ▪ Celerra Replicator – Async only
<p>Rich Functions/Solution Integration Over 30+ available features & functions</p>	<p>Does not have: Concurrent Protocol support, Double Parity RAID, FlexVol, FCP, FlexClone, FlexCache, SnapLock, SnapVault, OSSV, SyncMirror, LockVault, SMBR, SnapDrive, SnapValidator, MetroCluster</p>
<p>Warranty – 3 years for Hardware & Software</p>	<p>Warranty - 2 years on hardware, 90 days on Media only</p>

Know When to Walk and When to Talk against the Competition

EMC = Complexity

- 3 hardware families
- 3 OS's & 3 Sets of mgmt. tools
- Complex upgrades



IBM N series = Simplicity

- One hardware family
- One OS & Set of mgmt. tools
- Simple upgrades **Enterprise**

IBM System Storage N series = Unified Storage Solutions

Entry-Level

Summary

- IBM and NetApp are a year into the Alliance and having great success thus far
- N series solutions provide Unified Storage and investment protection that no other product can
- Portfolio serves three highly desired environments from single platform
 - High-Performance, mission-critical data environments
 - Archive and data retention environments
 - Most important, disaster recovery site missions
- Focus on N series in primarily IP environments and for specific applications. Keep selling DS.
- IBM Total Solution
 - Server, Storage, Management Software, Virtualization, and Services
 - IGS Worldwide Presence
 - IBM Global Financing



Resources

- **Want more detailed information about August 22nd announcement**
 - Watch for more technical, more in-depth education on September 19th

- **If you would like to be placed on the N series distribution list to receive current information about new postings and upcoming education events send a note to:**
 - [N series Distribution List - N7000 Sales Presentation](#)

- **To learn more about the N 7000 lineup, visit the N series Sales Kit:**
 - **IBM Direct Sales Site:**
 - <http://w3-1.ibm.com/sales/systems/portal/s.155/254?navID=f220s240&geoID=All&prodID=IBM%20TotalStorage%20Products&docID=Netappsk.skit&docType=SalesKit&skCat=DocumentType>

 - **Business Partner Sales Site:**
 - <http://www-1.ibm.com/partnerworld/sales/systems/myportal/s.155/307?navID=f220s240&geoID=All&prodID=NAS&docID=Netappsk.skit&docType=SalesKit&skCat=DocumentType>

- **External Home Page:**
 - <http://www-03.ibm.com/servers/storage/nas/>

Grazie per l'attenzione!



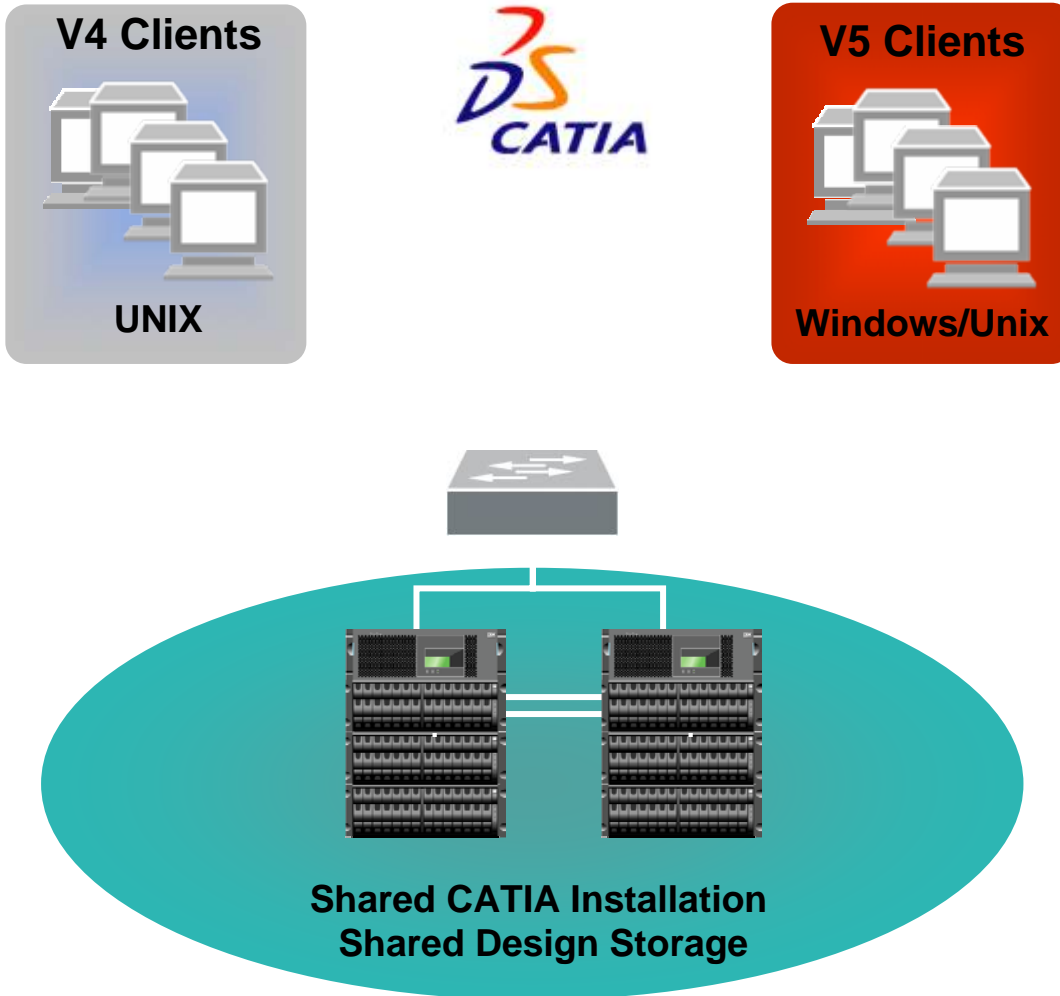
ibm.com/storage/solutions

ibm.com/software/tivoli

ibm.com/storage/services

Back-up

Dove vendere IBM Nseries Ambienti CATIA in fase di migrazione



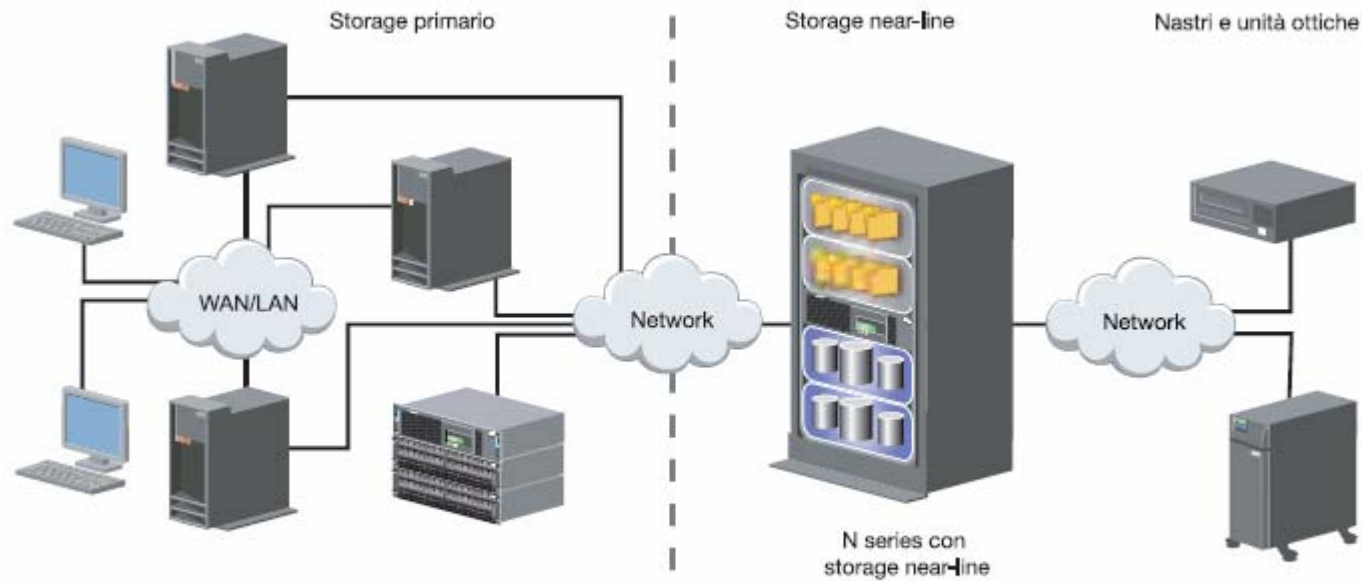
Solution:

- Replace current storage solution with N series Systems

Benefits:

- Accelerated deployment of CATIA Windows workstations
- Data consolidated in a single unified storage pool to enable users with different access protocols can share data seamlessly and efficiently
- V4 filename translation
- Reduced TCO and maximized Storage ROI

N series: near line storage



IBM System Storage N series con storage near-line

Studiato per assicurare la protezione e il recupero dei dati in modo efficace ed economicamente conveniente

IBM System Storage N series with FlexShare

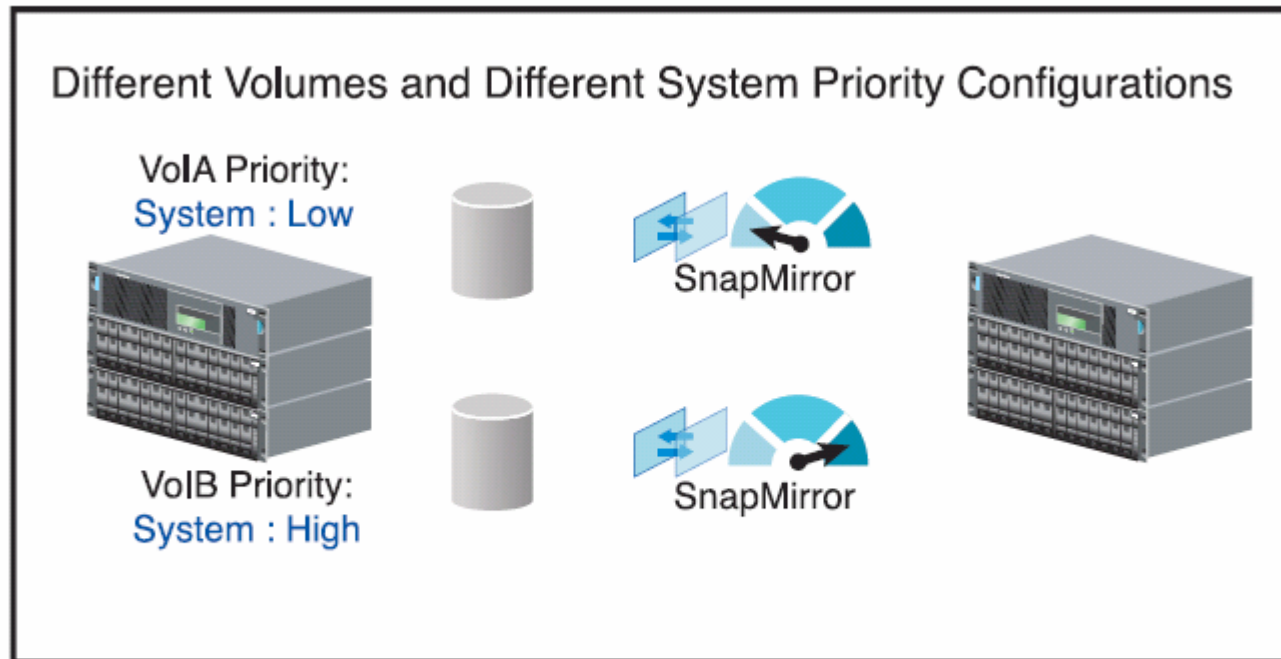


Figure 1—Different volumes and different system priority configurations

IBM System Storage N series with MetroCluster high-availability and disaster recovery solution

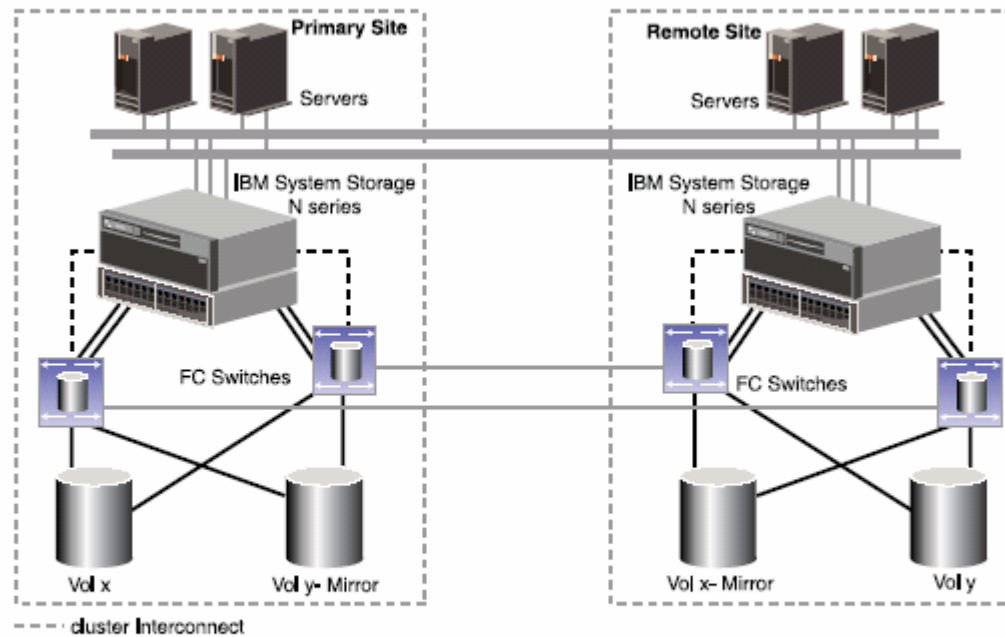
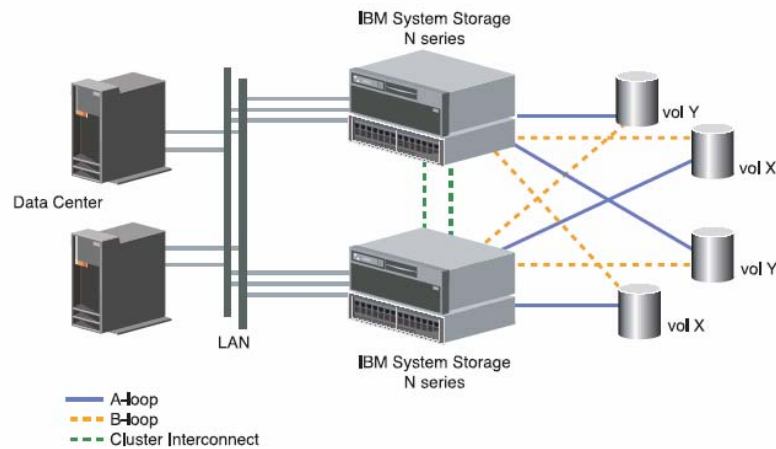


Figure 1) MetroCluster over Direct Fibre Channel switch connection

This solution provides high availability and disaster protection in a campus environment.

IBM System Storage N series with SyncMirror Software



IBM System Storage N series with SyncMirror with Clustered Failover

Replicating data using SyncMirror with filers in a Clustered Failover configuration supports high data availability, data redundancy, and automatic failover.

N series for ILM

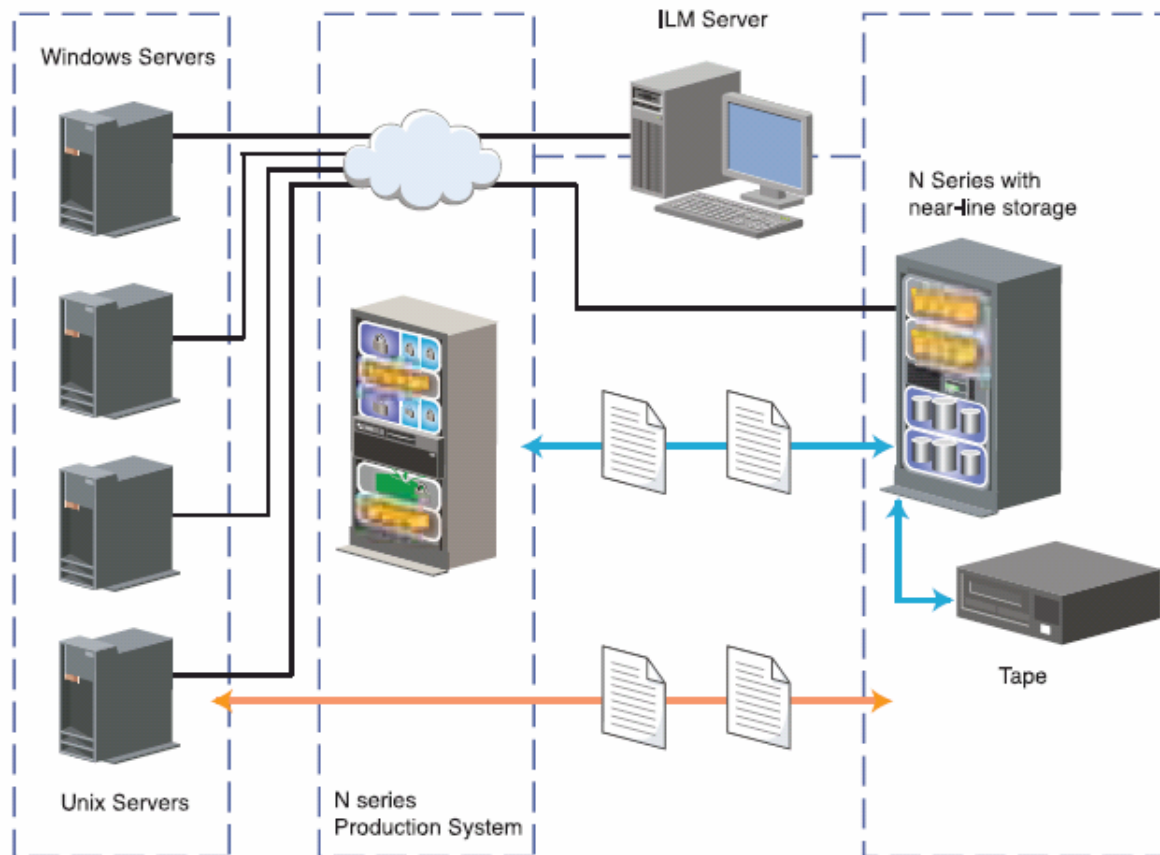


Figure 3 – Open ILM architecture

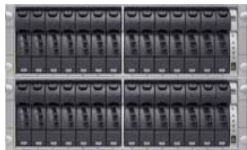
N Series Hardware Overview

All systems utilize the same software & management

**Entry Level appliance
with Fibre Channel
& SATA disk drives**

N3700

FAS270



16TB

**Midrange appliances
with Fibre Channel
& SATA disk drives**

N5200

V3020
FAS3020



84TB

N5500

V3050
FAS3050



168TB

**Enterprise class appliances
with Fibre Channel
& SATA disk drives**

N7600

V6030
FAS6030



420TB

N7800

V6070
FAS6070



504TB

G

A

N series Software Features & Functions

<u>Included</u>	<u>Optional</u>	<u>Optional</u>
1. Data ONTAP	15. CIFS Protocol	32. SnapManager for SQL
2. iSCSI	16. NFS Protocol	33. SnapManager for Exchange
3. iSCSI Host Attach Kit for AIX, Windows & Linux	17. HTTP Protocol	34. SnapValidator
4. FTP	18. FCP Protocol	35. Single Mailbox Recovery for Exchange
5. Snapshot	19. Cluster Failover	36. DataFabric Manager
6. SnapMover	20. FlexClone	37. MetroCluster
7. FilerView	21. MultiStore	38. Near-line feature*
8. FlexVol	22. SnapMirror	
9. FlexShare	23. SyncMirror	
10. SecureAdmin	24. SnapRestore	
11. AutoSupport	25. SnapVault	
12. Disk Sanitization	26. Open Systems SnapVault	
13. RAID-DP*	27. SnapLock Enterprise	
14. RAID-4*	28. LockVault Enterprise	
	29. SnapLock Compliance*	
	30. LockVault Compliance*	
	31. SnapDrive for Windows, Unix: (AIX, Solaris, HP-UX) & Linux	

Features:

- Included with base system
- Optional feature (fee)

* not available with gateways

Supported Expansion Units for Appliance Models

- EXN1000 contains up to 14 fibre channel drives
 - 72GB, 10K RPM FC
 - 72GB, 15K RPM FC
 - 144GB, 10K RPM FC
 - 144GB, 15K RPM FC
 - 300GB, 10K RPM FC

- EXN2000 contains up to 14 SATA drives
 - 250GB, 7.5K RPM SATA
 - 320GB, 7.5K RPM SATA
 - 500GB, 7.5K RPM SATA

- For Expansion Unit configuration rules, refer to N series Configuration tips, located in the N series Sales kit:
 - <http://w3-1.ibm.com/sales/systems/portal/s.155/254?navID=f220s240&geoID=All&prodID=IBM%20TotalStorage%20Products&docID=tstoNseriesConfigTips051506>

Competition:

IBM N series / EMC NAS – Quick Look

IBM N series NAS

- ▶ Proven architecture since 1992
- ▶ Full redundant Architecture
- ▶ Full Business Continuity support
- ▶ Predictable, proven mixed protocol performance
- ▶ Single point of management
- ▶ Engineered end-end integration
- ▶ Data-in-Place upgradeable / data protection



EMC NAS

- ▶ Immature architecture < 3 yrs old
- ▶ Multiple Single Points of Failure
- ▶ No Business Continuity - DR Only
- ▶ Unpredictable/limited mixed protocol performance
- ▶ Multiple points of management
- ▶ Limited backend integration
- ▶ Forklift upgrade / data risk
- ▶ No “real” performance benchmarks

