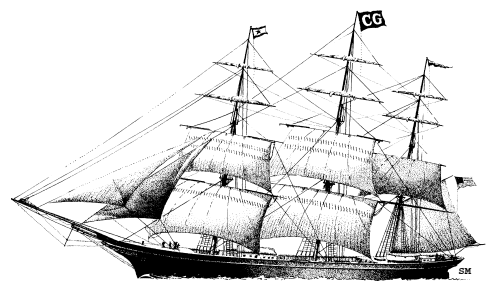


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NetApp Unifies SAN and NAS – Simpler is Better

Analyst: Michael Fisch

Management Summary

Modern technology is amazing. Cell phones, automobiles, airplanes, the Internet, cable TV, and so forth allow us to see more, hear more, learn more, go further, and generally experience more in our day-to-day lives. **The unconscious tradeoff of our accelerated existence is added layers of detail and complexity.** Frankly, it's a lot to manage. **Simplicity, therefore, has become more rare and valuable than ever.**

NetApp rose to prominence in the storage industry by delivering simplicity in networked storage. Its NAS appliances are easy to install and manage, leverage existing IP networks, offer integrated, value-added features like replication and failover, and offer the TCO benefits of networked storage. Many enterprises embraced the user-friendly, NAS appliance concept.

Now NetApp has announced *unified storage* – SAN and NAS in the same appliance. Its new FAS900 series as well as updated F880 and F825 storage appliances not only serve files over IP networks, they also provide block-level access to data over Fibre Channel (FC) networks *at the same time*. NetApp is no stranger to the FC architecture; it has been deploying FC storage in many of its products behind the scenes. Now the enterprise will have direct storage access over a FC SAN. (Support for IP-based SANs via iSCSI is forthcoming.)

Well, if NAS was simple, then why add SAN? After all, SAN deployments tend to be more complex. Because SAN and NAS are, in fact, complementary – they are flip sides of the same networked-storage coin. Though they sometimes compete in the marketplace, there is a need and distinct role for each one in many enterprises. NetApp's unified storage approach offers:

- **Flexibility** – Enterprises do not have to make a definitive SAN or NAS decision upfront. As requirements change, the infrastructure can easily adapt, protecting the investment and delivering a more certain return.
- **Centralized management** – A consolidated SAN and NAS storage pool with one management console is easier to manage than two separate ones, which cuts back operating costs and helps increase utilization.

The net effect is a lower TCO than what the traditionally separate SAN and NAS infrastructures can offer. Coupled with NetApp's appliance simplicity and value-added software features, unified storage offers a solid value proposition. NetApp customers that want to branch into SANs should be pleased. It is also an option to consider, in general, for enterprises that want an all-in-one solution for networked storage. Read on for more details.

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The Clipper Group, Inc. - Technology Acquisition Consultants ♦ Strategic Advisors

888 Worcester Street ♦ Suite 90 ♦ Wellesley, Massachusetts 02482 ♦ 781-235-0085 ♦ 781-235-5454 FAX
Visit Clipper at www.clipper.com ♦ Send comments to editor@clipper.com

SAN versus NAS

There is a long-running debate about the merits of SAN versus NAS.¹ *The short answer is yes. Yes, you need them both.* Some applications insist on SCSI/SAN block-mode protocols, like Microsoft Exchange or SQL Server. Other applications insist on NAS, like file sharing. But there is a vast gray area between those two extremes where either one could fit. Which to choose depends on:

- Application requirements,
- The IT department's areas of expertise and budget resources,
- Existing storage and network infrastructure, and, frankly,
- One's philosophical bent.

It is a determination to make on a case-by-case basis. **The only general principle is that SAN and NAS – networked storage – are superior to their predecessor, direct-attach storage (DAS).** They deliver higher utilization, simpler management, and much lower TCO.

NetApp Unified Storage

Since SAN and NAS are complementary, NetApp decided to offer both in the same storage device. It recently announced support for *unified storage* in its new FAS900 series as well as enhanced F880 and F825 appliances. They support SAN, NAS, and even DAS simultaneously and interchangeably. Storage capacity can be assigned via the needed protocol through easy-to-use configuration software.

Beyond the inherent goodness of SAN and NAS, NetApp's unified storage approach delivers incremental benefits of *flexibility* and *centralized management*. **The fact that storage capacity can go either way provides options.** Enterprises do not have to make an irreversible SAN-or-NAS decision upfront, nor do they have to buy

¹ See *SAN versus NAS – The Holy War Not Worthy Fighting* in *The Clipper Group Navigator* dated September 27, 2000, at www.clipper.com/publications.htm.

SAN and NAS – Storage Bedfellows

Consider a stack of lumber versus a house. Both are wood, but the lumber is raw material and the house is a final product. The lumber is flexible and can be turned into anything – a fence, a shed, or a million toothpicks. The house, though, has “structure” and serves a more specific purpose.

Likewise, both SAN and NAS are networked storage. A SAN presents logical unit numbers (LUNs) – “raw” block-level data – to host servers. The servers assemble the LUNs into volumes for storing data pertinent to their respective applications. SANs are usually based on Fibre Channel networking, though new technologies like iSCSI allow IP to be used.

NAS presents a network file system to multiple applications and users over an IP network. A file system, built on top of a volume, is more “structured” than block-level data. It stores files (e.g., spreadsheet, word processor, video) in a directory (folder) and keeps contextual information such as size, date created, last modified, and who created it. It also allows multiple applications and users to share files, unlike SANs which dedicate LUNs to specific hosts.

So SAN and NAS are storage bedfellows, serving different but important roles in the arena of networked storage.

additional equipment to convert from SAN to NAS later. It is an easy reconfiguration if more of either one is needed in the future. **Since business and technology requirements change quickly and unexpectedly, there is a real value in having room to maneuver.** Financial gurus know this and have concocted elaborate models for measuring the value of options. **The point is that flexibility, even if unexercised, is worth something.**

The New NetApp FAS900 Series

The latest and highest-performing addition to NetApp's line of storage appliances is the FAS900 series. The FAS960c scales to 48 TB in a clustered configuration with 144 GB drives, and the FAS940c scales to 18 TB with 73 GB drives. **Both are suitable for enterprise data center environments.**

The new appliances support SAN and NAS simultaneously. The NAS side delivers file access over IP networks with NFS, CIFS, HTTP, and DAFS protocols. The SAN side provides block-level access over Fibre Channel networks for Solaris and Windows servers. It includes capabilities for LUN masking and mapping, host grouping, and dynamic LUN expansion. iSCSI support for block access over IP networks is also forthcoming.

Like other NetApp products, the specialized *Data ONTAP* operating system and high-performance *WAFL* file system are the foundation for storing and managing data. The system adds the appropriate LUN or file semantics to the data, according to user configurations. **This architecture provides the flexibility for simultaneous and interchangeable block and file access.**

NetApp's *FilerView* tool manages individual appliances, and its *DataFabric Manager* provides discovery, reporting, and event notification for multiple, distributed NetApp filer, *NearStore*, and *NetCache* appliances. NetApp is also tipping its hat to multi-vendor storage environments through the *Managed ONTAP API*, which will allow third-party developers to interface with and manage NetApp appliances.

Finally, NetApp offers a variety of tightly-integrated software features for improving performance, availability, and manageability. These include *SnapShot*, *SnapMirror*, *SnapRestore*, *SyncMirror*, *SnapVault*, *Clustered Failover*, *MultiStor*, *SnapDrive*, and *VFM*.

The second benefit derives from the fact that it is easier to manage fewer things. **Whether you are juggling balls, herding sheep, or managing storage devices, fewer is easier.** SAN and NAS have traditionally been separate infrastructures requiring separate management. **By centralizing management at the storage device level², NetApp has removed a significant burden and cost from maintaining two infrastructures.** It also improves utilization by allocating SAN and NAS capacity from a common storage pool.

Enterprises are responsible for delivering a return to shareholders, and therefore technology becomes an economic decision in the end. **Unified storage clearly delivers a better return than segregated SAN and NAS infrastructures.**

² SAN environments also require management at the switch, host bus adapter, and server levels.

Conclusion

Unified storage is a major step for a vendor that rose to prominence by carving out a market for NAS appliances. **It places NetApp in a favorable position to meet enterprise needs for a converged SAN/NAS infrastructure.** Delivering both in an appliance is a simplified approach that can save money. Add in NetApp's expanding repertoire of advanced software features, and it becomes a nice solution indeed.

NetApp customers should welcome this warmly. **They can now venture into SAN configurations while still enjoying the simplicity of NetApp appliances.** Other enterprises that want networked storage and value the flexibility and centralized management of unified storage should also consider NetApp's latest offering.



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- ***The Clipper Group can be reached at 781-235-0085 and found on the web at www.clipper.com.***

About the Author

Michael Fisch is a Senior Storage and Networking Analyst with The Clipper Group.

He brings over six years of experience in marketing and engineering at computer hardware and software manufacturers. Mr. Fisch worked at EMC Corporation as a marketing program manager focused on service providers and as a market analyst. Prior to that, he worked in international channel development, manufacturing, and technical support at Extended Systems, Inc. Mr. Fisch earned an MBA from Babson College and a Bachelors degree in electrical engineering from the University of Idaho.

- ***Reach Michael Fisch via e-mail at MFisch@clipper.com or at 781-235-0085 Ext. 25.***

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