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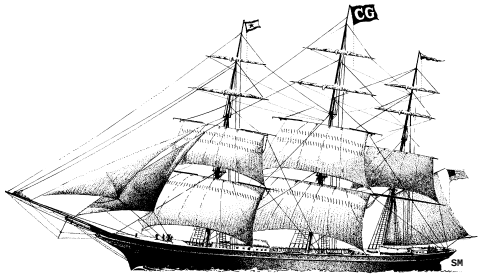

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Lefthand Networks Makes Networked Storage Simpler to Manage and Easier to Scale

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Management Summary

It is no secret that direct-attached storage is giving way to networked storage. Storage area networks (SANs) are now a common way to connect multiple servers to a centralized pool of storage. Network-attached storage (NAS) is also widely used for file sharing over a network. **Enterprises need more efficient and cost-effective ways to store and manage data, and networked storage delivers.**

Meanwhile, the storage industry is beginning a shift from first-generation SAN and NAS solutions to "next-generation" technologies that deliver even greater efficiencies. There is no end in sight to the rapid growth of information, and enterprises certainly could benefit from further storage improvements. Lefthand Networks of Boulder, Colorado, has responded to this call with its *Network Storage Module 100* (NSM).

NSM is a compact, multi-purpose networked storage device that scales as easily as stacking Legos®. It enhances first-generation SAN and NAS solutions in several ways:

- **SAN / NAS consolidation** – NSM offers both block and file access, combining SAN and NAS into one solution for greater manageability.
- **Simpler and more economical IP-based SAN** – NSM connects to IP networks, allowing users to unify the LAN and SAN with a single, ubiquitous, affordable, and more widely-understood networking technology.
- **Ease of installation** – NSM offers the best of both worlds by giving NAS appliance-like ease of installation with SAN functionality.
- **Granular scalability** – NSM scales capacity and performance consistently and in small increments for the ultimate in pay-as-you-grow.

The result is a storage solution with greater simplicity and more incremental scalability – both of which help lower total cost of ownership. Lefthand Networks's NSM puts SANs within reach of those with modest resources, namely small- and mid-sized IT environments, and includes NAS for an all-in-one solution. If you have not yet made the leap to networked storage, NSM is a reason to consider, or reconsider. Even if you already have deployed NAS or SAN, you may find NSM is a better fit for certain environments. Read on for the details.

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A Brief History of Storage

In the beginning, each server had its own, direct-attach storage (DAS). This worked well until the era of distributed computing, when servers proliferated and filled the enterprise with disconnected islands of information. **It became difficult and labor-intensive to manage and utilize these islands, leading to spiraling storage costs.** Rapid data growth compounded the problem, and enterprises needed a better solution.

The storage industry responded with the brilliant idea of separating storage from servers and making it broadly accessible over a network. One approach is a storage area network (SAN), which connects multiple servers to a centralized pool of block-level storage, typically over a Fibre Channel (FC) network. Another is network-attached storage (NAS), which provides file sharing usually over an IP[1] network. SAN and NAS are optimized for different applications, and many organizations use both.[2] **More importantly, both provide simpler management, better resource utilization, and a much lower total cost of ownership (TCO).** The market has recognized this, and these technologies have enjoyed widespread adoption and fast growth.

Still, there is no end in sight to the fast growth of enterprise information. Annual growth rates of 100% are not uncommon, and even more efficient storage technologies are required. **One company that has stepped up to the plate is Lefthand Networks – it offers a "next generation" of unified, networked storage that promises greater simplicity and cost-effectiveness.**

Network Storage Module 100

Lefthand Networks's product is called the **Network Storage Module 100 (NSM)**. Think of it as a compact, multi-purpose storage brick, accessed over an IP network, with built-in SAN and NAS capabilities. It scales brick by brick, while users maintain simple, centralized management of all units. (See box at right.)

Improving on Networked Storage

Like first-generation SAN and NAS solutions, the NSM delivers simpler management, better resource utilization, and lower TCO. But how does it improve upon existing solutions? Consider these four areas.

SAN / NAS Consolidation

Storage consolidation is one of the primary drivers of SAN and NAS deployment. It is much easier to manage and utilize storage (or *anything*, for that matter) when consolidated under a single framework. **However, first-generation SAN and NAS solutions are typically separate infra-structures – they're not consolidated!** That alone creates complexity and inefficiency.

NSM solves this problem by converging block and file access into a single product. As a result, there are fewer tools to learn, fewer administrative tasks, less wasted capacity, and a better TCO.

IP SANs: Simpler and Less-Expensive Than Fibre Channel

It is true that FC is the prevalent

NSM 100 at a Glance

Each NSM is a self-contained unit of networked storage. It is 1U in height and contains 4 IDE disk drives, for a total capacity of 160 to 480 GB, depending on drive size. There are two IP connections – one Gigabit Ethernet and one 10/100 Ethernet. It supports block-level storage using a low-overhead protocol called AEBS (Advanced Ethernet Block Storage) that is compatible with Windows NT/2000, Solaris, and Linux hosts. It also supports file access and sharing is using NFS (Unix), CIFS (Windows NT/2000), HTTP, and FTP.

To increase capacity, users simply connect more NSMs to the network, which can be the existing LAN or a dedicated IP SAN. A utility provides centralized management of all units, and administrators can dynamically allocate capacity to volumes and file systems. Redundant components, RAID, and two-unit failover clusters enable high availability.

In a future release, Lefthand Networks will incorporate advanced block virtualization and replication technology. This will allow an effectively unlimited number of NSMs to behave as a single system for the purposes of data sharing, striping, and replication.

List prices start at $15,000 for a 160 GB NSM, including hardware, software, and a three-year support warranty.

[1] Refers to the TCP/IP protocol running typically over Ethernet.

[2] See *SAN versus NAS – The Holy War Not Worth Fighting* in **The Clipper Group Explorer** dated September 27, 2000, at http://www.clipper.com/publications.htm.

interconnect for SANs, but it is equally true that it involves certain costs and complexities that have deterred many enterprises from adoption. FC works well for storage because it is fast, low-latency, extends to 10 km, and can be deployed as a network. However, FC equipment costs more than IP-based storage networking. It also requires an IT department to develop expertise in an additional networking technology – no small endeavor. Furthermore, interoperability issues cause FC SAN deployment not to be a plug-and-play operation. As a result, many have not had the wherewithal to take on FC SANs, especially small- and medium-sized enterprises (SMEs).

Meanwhile, IP has emerged as a less-costly, less-complicated SAN alternative. **IP is already the standard for data networks and can unify the LAN and SAN with a single, ubiquitous, relatively affordable, matured networking technology.** It would allow synergies in deployment and administration. And with the advent of Gigabit and eventually 10 Gigabit Ethernet, IP's wire speeds will rival FC. The downside is IP requires more overhead processing that can affect data transmission and host server performance. However, the performance of IP storage is quite acceptable for many servers, applications, and environments, especially considering gains in cost and simplicity; one must look at the total value proposition. Moreover, there are host bus adapters available that accelerate processing in hardware and offload the server CPU.

By offering an IP-based SAN, Lefthand Networks removes significant impediments to SAN adoption. Enterprises can enjoy the economies of scale that SANs deliver without the greater costs and complexities of FC.

Easy Installation

Lefthand also touts how easy it is to install NSMs – typically in less than 15 minutes. Easy installation is a benefit long associated with NAS appliances. In fact, it contributed significantly to the success of that market, sometimes even as an alternative to harder-to-install FC SANs. **NSM offers the best of both worlds by delivering NAS-like ease of installation with SAN functionality.**

Granular Scalability

All IT departments worry about scalability, and all storage systems scale – but the question is how easily and economically. Large, monolithic arrays – the supertankers of storage that pack hundreds of drives and dozens of host ports into one system – scale by adding drives to a system until it's full, then purchasing another. Since each system costs hundreds of thousands or millions of dollars, the outlay can be cost-prohibitive for all but the largest enterprises. Mid-range, modular storage with dozens of drives and several ports offers scalability in somewhat more bite-sized chunks, but Lefthand Networks takes this concept to the extreme.

NSM enables highly granular scalability. **The cost of entry is very low – a single brick – and users can scale in a gradual, incremental fashion.** It is truly "pay as you grow", which avoids big shocks to the wallet and helps lower TCO.

NSM also delivers greater consistency by scaling capacity and performance at the same time. Other storage arrays can experience performance degradation when adding more drives because of fixed processing power and bandwidth per system. **NSM, on the other hand, scales in all dimensions simultaneously and maintains the ratio of performance and capacity.**

Conclusion

The NSM 100 makes the deployment and management of networked storage simpler and more cost-effective. Since administrative costs can be several-to-many times the acquisition cost of storage over its useful life, this is a critical benefit. While NSM may not be as fast as high-end storage systems, **its virtues of greater simplicity, more granular scalability, and lower TCO make it an especially attractive solution for small- and mid-sized IT environments.** It opens the door for SMEs to deploy SANs, and large enterprises may find it a nice solution for workgroups and remote offices. **In considering the total value proposition, it appears Lefthand Networks's NSM has staked out a new and compelling position on the spectrum of networked storage solutions.**

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