



Stonefly Delivers a SAN for the Masses

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Management Summary

One hundred years ago, the entrepreneur Henry Ford saw great potential for the automobile to transform society, but only if common folks could acquire it. Previously, cars were costly, high-maintenance machines that only wealthy people could afford. Ford solved this problem by designing a basic, reliable car – the Model T – and manufacturing it in mass quantities using assembly lines. The rest, as you know, is history.

Today, the storage-area network (SAN) is at a similar juncture as the automobile was 100 years ago. While SANs may not be as profound or romantic, they do solve a critical problem of the Information Age – storing and managing ever-increasing quantities of data. SANs help enterprises get their arms around storage by consolidating it on a network. **In fact, they are so much more efficient and cost-effective than their predecessor – direct-attach storage – that all enterprises ought to have one. The problem is that SANs today, like cars of the past, are too costly and complex for many to acquire.**

Nearly all existing SANs are based on Fibre Channel (FC), a high-performance storage interconnect. Though it is a fine technology, FC is relatively costly, requires learning and administering another network, and is not exactly plug-and-play. Many large-enterprise data centers have overcome these issues and deployed FC SANs, but most small- and mid-sized IT environments have been deterred by the technical depth and financial resources required. **What the world needs is a simpler and more affordable SAN.**

That is the vision of Stonefly Networks – to deliver a SAN for the masses. Stonefly recently announced the *Storage Concentrator*, an intelligent appliance that allows enterprises to deploy SANs based on IP, the pervasive network protocol used in local-area networks (LANs), and the new iSCSI protocol for accessing block-level storage. It pools multiple storage arrays and presents them to servers as logical volumes. The Storage Concentrator boasts an installation in less than 15 minutes and an easy-to-use management utility. It also costs as little as \$7,995 per unit. **In short, the Storage Concentrator allows enterprises to deploy a SAN using their existing LAN in a simple and affordable manner.**

With this approach, Stonefly hopes to take the benefits of SAN ownership – higher utilization, simpler management, and lower total cost of ownership (TCO) – to a much broader market. It will be especially attractive to small- and medium-sized enterprises as well as workgroups and remote offices at large enterprises. **So, if your enterprise does not yet have a SAN and still struggles with the limitations of “horse-and-buggy” storage, Stonefly has a story worth hearing.** Read on for the details.

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The SAN Revolution

The SAN has revolutionized storage. It used to be that all storage was attached directly to servers. As applications and servers proliferated, this led to an abundance of disconnected “islands of information”. It became costly and labor-intensive to manage, protect, and fully utilize all of these islands. A SAN solved this problem by consolidating the storage in a common pool and making it broadly accessible over a network. As a result, SANs can greatly simplify storage management, increase utilization of capacity, speed backups, and ultimately lower total cost of ownership. **These benefits are not just good but necessary in a world where the amount of information is doubling each year in many enterprises.**

If SANs are so effective, why doesn't everybody have one? Well, most large enterprises do, but most small- and medium-size enterprises (SMEs) do not. Even in large enterprises, SANs are in data centers but not necessarily workgroups or remote offices. **The reason is certain costs and complexities associated with FC, the de facto standard SAN interconnect, have impeded adoption in IT environments that lack larger budgets and technical staff.**

For instance, FC equipment costs significantly more than Ethernet, the standard transport for IP LANs. FC is also not “plug-and-play” due to a lack of broad interoperability among vendors, so enterprises must purchase professional services for SAN design and implementation. Furthermore, new storage arrays are necessary when existing storage does not support FC switched fabrics (SCSI¹ arrays, for example). **Though FC prices have come down, the initial outlay for a FC SAN is still daunting for many enterprises.**

Even more significant in the long run is the cost of managing a SAN. **Acquiring administrators with skills in FC networks is costly and fairly difficult.** Here again, larger enterprises can afford this luxury, but many others cannot.

The necessity of SANs coupled with the current barriers to adoption have created a

distinct market opportunity for someone, in the spirit of Henry Ford, to bring SANs to the masses.

The Stonefly Storage Concentrator

Stonefly Networks of San Diego, California, perceived this opportunity and has announced a solution for simpler and more affordable SANs – the *Storage Concentrator*. It is an intelligent appliance that connects traditional direct-attach storage to an IP-based SAN and presents it as a single pool of storage. Using the iSCSI protocol, servers can access the storage over the network as virtual volumes. **In effect, the Storage Concentrator takes existing storage and networking resources and – voilà – turns them into a SAN.**

The Storage Concentrator is a combination router, bridge, and storage pooling engine. It translates and routes iSCSI traffic from the IP network² to and from attached SCSI and FC storage arrays. Each unit has 3 SCSI ports or one SCSI and one FC port³ for connecting to storage and a Gigabit Ethernet port for connecting to the IP network. **It pools all storage into virtual volumes and securely maps them to individual hosts⁴ on the network using access control lists.** Users can dynamically enlarge volumes or create new ones. For high availability, the Storage Concentrator can store configuration data locally and remotely in case a unit fails and needs to be replaced. It also comes in two versions: the standard *i1000* and the more robust *i1500* with local mirroring for the OS and dual power supplies. A future version will offer advanced replication features, like point-in-time copy and remote mirroring.

The Storage Concentrator is designed for ease of use. It boasts installation in less than 15 minutes. Users can centrally manage all Storage Concentrators and their associated volumes with a single Web-based interface. The appliance is also upgradeable via a software download, avoiding forklift upgrades. Furthermore, Stonefly has partnered with leading storage and

² More specifically, TCP/IP over Ethernet.

³ Available in Q3, supports FC switched fabrics and arbitrated loops.

⁴ Currently supports Windows NT/2000 and Linux hosts.

¹ Small Computer Systems Interface

host bus adapter providers to deliver complete solution sets through resellers. Suggested retail prices are \$7,995 and \$9,995 for the i1000 and i1500, respectively.

Lowering the Hurdle to SAN Adoption

By embracing IP SANs, ease of use, and existing storage resources, Stonefly has lowered the hurdle that enterprises must clear to adopt a SAN.

Lower Acquisition Cost

First, it costs less to acquire a SAN using Stonefly's Storage Concentrator. The product itself is relatively inexpensive, and it can SAN-enable existing storage arrays, thereby reducing new-storage expenditures. It can also leverage existing Ethernet LAN equipment, and additional new equipment will cost significantly less than FC. This is true for Gigabit Ethernet, but even more so for 10/100 Ethernet equipment that actually costs an *order of magnitude* less than FC – and can still provide adequate connectivity for many workgroup applications. Quick and easy installation also means customers can avoid the hefty professional services fees associated with FC SANs. Finally, the Storage Concentrator allows IT departments to rationalize storage procurement by using robust, high-performance storage for mission-critical applications and less-costly storage for other applications. **In short, enterprises can expect to pay much less “out of the box” for a Stonefly SAN.**

Lower Operating Cost

While up-front costs are important, operating costs are even more so because they amount to several times the cost of storage acquisition over its useful life. Like SANs in general, the Storage Concentrator lowers operating costs through storage consolidation, simpler management, higher utilization, and easier backup. But it takes simplicity a step further by allowing enterprises to use IP networks rather than FC. Most enterprises already have an IP LAN and can readily leverage their skills and management utilities to the SAN – no need to learn another networking technology. **IP brings synergies in deployment and administration by unifying the LAN and SAN with a single, ubiquitous,**

matured networking technology.

Tradeoff

The tradeoff – and there are always tradeoffs – is lower performance than with a full FC SAN. While IP's wire speed rivals Fiber Channel's – with Gigabit and eventually 10 Gigabit Ethernet – the iSCSI and TCP protocols require more overhead processing that can affect data transmission and host server performance. There are now host bus adapters available that accelerate processing in hardware and offload the server CPU, but they also add to the cost of the solution. One must look at the total value proposition and understand that performance comes with a cost. **The value of IP is that it enables a simpler and more affordable SAN with performance that is quite acceptable for many servers and applications – especially those in small- and mid-sized IT environments.**

Conclusion

Successful technology products are not necessarily those with the most bells and whistles, but those that solve real customer needs. Currently, more enterprises need the economies of scale in storage that a SAN brings, but impediments of cost and complexity have stood in the way. If you are in this category, Stonefly may be the solution. Its Storage Concentrator has arrived at the right time to address these concerns and pave the way for broader SAN adoption, especially among SMEs and in workgroups and remote offices of larger enterprises.

Like Henry Ford with the automobile, Stonefly has made SANs less expensive and easier to use. While only the future will tell if Stonefly is successful in reaching the masses, it is clear this strategy has worked in the past.



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