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iSCSI: The Disruptive Force

Storage-area networks (SANs) based on the Internet Small Computer Systems Interface (iSCSI) represent the next leap in capabilities companies will use to support growth in information storage and management requirements.

Now, iSCSI is ready to bring SANs into the small/medium business (SMB) market mainstream and greatly affect enterprise SAN decisions.

The SAN has been a part of enterprise storage systems for quite some time, adding flexibility and control to the maintenance of vast arrays of data storage devices. Meanwhile, Fibre Channel (FC) has slowly gained in SAN market share. It started in 1988, and the American National Standards Institute first ratified it in 1994.

Fibre Channel has compatibility between vendors as well as an infrastructure of host bus adapters (HBAs), switches, bridges, and supporting software. It also accepts a number of storage device protocols within its structure. But the support of the SCSI protocol and the adoption of a switched technology, similar to Ethernet, gave FC SANs their credibility. Once this technology's direction was stabilized, the picture seemed clear.

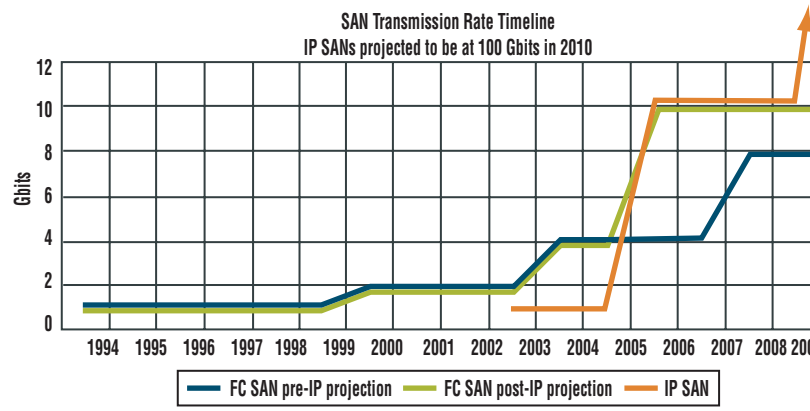
Like direct-attached storage (DAS), network-attached storage (NAS) is an alternative to SANs. NAS connects storage directly to an IP network. It's also relatively easy to install and very inexpensive, giving it a strong position in small to mid-range businesses.

Yet FC SANs continue to dominate enterprise corporations because the block-storage structure provides better data-transfer performance than NAS's file-storage structure. Also, FC SANs are better able to maintain centralized data management.

The battle lines were drawn until a new concept arrived. IP SANs are all the rage in the industry now. They began in 1998 with an IBM proof of concept, and the Internet Engineering Task Force standardized them in 2003. iSCSI implements the SCSI protocols within the TCP/IP framework.

IP SANs based on iSCSI take advantage of both the low cost of Ethernet communications inherent in file-based NAS storage and the block-storage centralized data-management capabilities of FC SANs. They can be considered the best of both worlds. Also, they can take advantage of Ethernet speed increases, producing SAN transmission rates the storage industry hadn't anticipated.

Storage vendors hadn't expected the need for 10-Gbit SAN transmissions for four to six more years. FC SAN solutions that reach 4 Gbits used to make sense, following a non-disruptive path of slow growth. But the Internet requires immense increases of data transmissions, so Ethernet went from 1 Gbit to 10 Gbits.



10-Gbit Ethernet HBAs are available today. Many corporations are looking at 10-Gbit IP SAN solutions for the near future. The storage industry is witnessing the initial ripples of the oncoming tsunami of high-speed, low-cost IP SAN solutions, which not only have caught up to the best speeds Fibre Channel can offer, but also can go beyond what had been in Fibre Channel's future.

FROM DISRUPTION TO LEADERSHIP • Many major corporations in the SAN industry, including those that originally ignored IP SANs, have IP SAN-compatible products for enterprise, mid-range, and small businesses. All SCSI storage devices can be bridged to IP SANs.

IP-savvy network personnel already are in place in SMBs and enterprise corporations. And with Microsoft and other operating-system vendors supplying software compatibility for IP SANs, this disruptive technology is impacting the storage industry.

IP SANs based on iSCSI are affecting the projections for Fibre Channel's future. The FC SAN community also is campaigning to try to stem the tides of change. Will iSCSI-based IP SANs become the industry standard for storage communications, the way TCP/IP Ethernet dominates Internet communications? It remains to be seen, but the future will be very interesting.

To find out how to use SCSI devices in iSCSI-based IP storage networks, see "iSCSI To SCSI Bridges Pave The Way To The Future" at www.electronicdesign.com, *ED Online 13078.*

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