

Storage Networking

10 Gigabit Ethernet, enhanced with Chelsio's communication-protocol acceleration technology, boosts storage bandwidth and facilitates the move to IP SANs, providing the benefit of unifying the data center to a single networking technology.

Applications

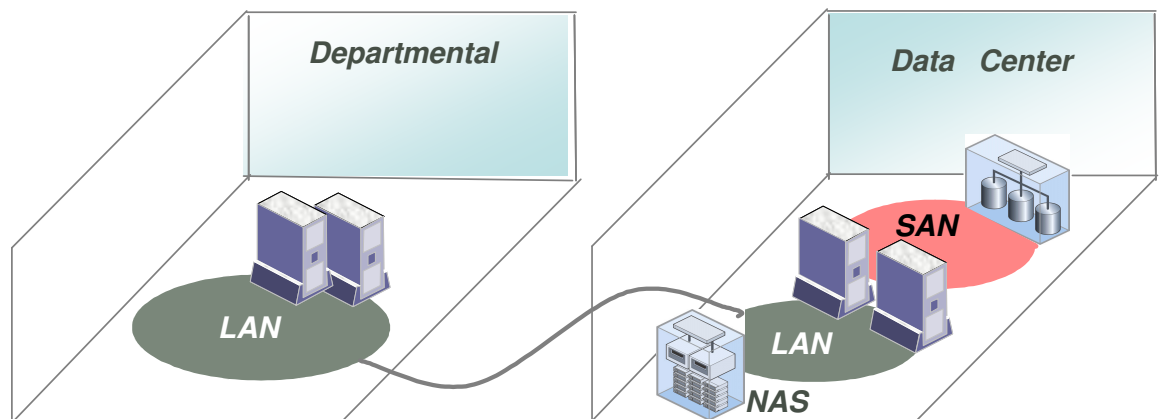
- Messaging
- On-line Transaction Processing
- Decision Support Systems
- Video Editing
- High-Performance Computing

File-oriented Network Attached Storage (NAS) and block-oriented Storage Area Networks (SAN) have become dominant in enterprise storage. With SAN/NAS-driven Storage consolidation delivering compelling management and availability benefits, organizations are moving away from Direct Attached Storage (DAS). In addition to making data available to the whole organization, NAS and SAN systems let organizations grow and manage storage without disrupting critical applications. NAS provides file-level access to its storage for all its clients. NAS systems serve files to computers over the data-center LAN, commonly using Gigabit Ethernet today.

A SAN is a network for conveying block-level data between servers and dedicated storage systems. The "killer app" for

SANs is storing databases, as database management systems (DBMS) typically convey block-level, rather than file-level, traffic.

Servers that use the SAN today are outfitted with a dedicated Fibre Channel network interface. Their applications' storage-services program interface (API), typically SCSI, is configured to direct applications' requests for block storage services to the SAN rather than to a local disk controller. Thus, the network interface "spoofs" a local disk controller, and carries SCSI commands and responses in Fibre Channel packets, transparently to applications.



The Challenge

While both departmental and mission-critical application servers can utilize GbE-based NAS systems for enterprise-wide consolidation of file data, access to Fibre Channel SANs for block storage consolidation is limited to core data centers.

Although Ethernet is by far the most widely installed networking technology, it was not the initial technology for SANs. Rather, it was Fibre Channel that better met SANs' requirement for low latency and low burden on the host-system for processing protocols. To explain, processing block-level storage requests and responses entail a considerable sequence of synchronizing messages between server and storage, so the delay for each message must be short, and the tax on the host processor for embedding the messages in a network protocol must be low. Now, 10GbE is here with low latency, low overhead, better ease of use, and compatibility with the rest of the enterprise's Ethernet networks.

The Challenge

Data-center demands for storage capacity and traffic keep growing, because of increased use of enterprise applications, ecommerce, and scientific applications. Disk drive capacity and CPU speed both increase every year, pressuring IT managers, as well as NAS, SAN, and server vendors to use faster network technologies.

Chelsio's 10 Gigabit protocol engines have dedicated silicon for offloading and accelerating protocols used in data-center shared storage. This capability enables 10 Gigabit Ethernet to offer dramatic improvements in capabilities and cost for the next generation of shared storage. In particular, Chelsio's implementation of the iSCSI protocol for SANs, which carries SCSI commands and responses in TCP/IP packets over Ethernet, meets the stringent low latency and low CPU overhead-overhead-for-packet-processing requirements for SAN.

Benefits

10 Gigabit Ethernet with Chelsio's protocol offload technology provides dramatic advantages for data-center shared storage systems.

Convergence of SAN and LAN --

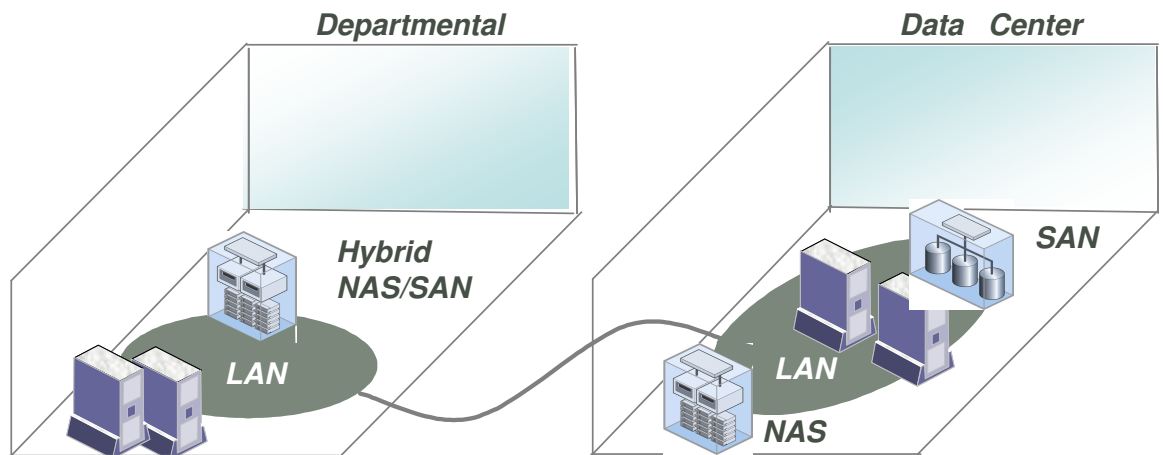
When SANs use the same network technology as the data-center LAN, the organization can reduce the cost for network interfaces, switches, cabling, management tools, spares, and technical skills needed to maintain two networks.

Bandwidth -- A server with a 10GbE link for used for both LAN and block

storage has over triple the bandwidth of one with a Gigabit Ethernet LAN link and a 2 Gbps Fibre Channel SAN link.

Ethernet Cost Profile -- Ethernet is the most widely deployed networking technology. Each Ethernet generation's scale economies have driven down prices farther and faster than any other networking technology. Today, 10GbE is largely uses fiber media. Recently Chelsio introduced the first 10GbE network interface for copper technology, employing a copper media standard that Infiniband uses. In 2006, the industry will ratify its standard for twisted copper pair wiring. Chelsio, along with all other 10GbE vendors will introduce 10GBASE-T interfaces and switches at low cost.

Integration of block- and file-storage capabilities -- Linking servers, block storage systems, and filers with a single network technology that can simultaneously support file and block protocols eliminates barriers to developing systems that support both block and file traffic.



The solution

Chelsio protocol engines enable highly scalable iSCSI and NAS storage, making the vision of enterprise-wide GbE/IP-based storage consolidation a reality. Chelsio's protocol engines enable high bandwidth and simplified management for both NAS and SAN while allowing a unified storage Ethernet network.