Technology

Cost-Effective

A STORAGE NETWORK

CAN KEEP YOUR BUSINESS UP AND

RUNNING IN THE EVENT OF A DISASTER

WITHOUT DEPLETING YOUR FINANCES.

B Y E L A I N E B I R D

CONNECTIVITY

ENTERPRISE-WIDE APPLICATIONS such as e-business, enterprise resource planning (ERP), and customer relationship management (CRM) generate such a tremendous amount of data that organizations using them are faced with unprecedented storage bandwidth requirements. At the same time, costs of network downtime are escalating—up to $6 million an hour for a financial brokerage firm. These factors are forcing CEOs, CFOs, and IT executives to rethink and implement a network contingency plan for business continuance and disaster recovery in the event of a man-made or natural incident.

They are looking for cost-effective ways to protect their mission critical data and provide for 24×7 application availability by replicating their data centers offsite. A robust, redundant storage network with geographically dispersed data centers is considered vital for ensuring a company's ongoing operation.

A favorite solution is a storage area network (SAN), a dedicated network that addresses companies' special storage requirements. Executives are also seeking solutions that extend these networks between data centers and over greater distances while supporting information recovery. The challenge is determining how to interconnect SANs—including those in remote sites—to a main site that enables backup and recovery under any circumstance and that eliminates performance and security issues due to these distance requirements. At the same time, enterprises are under increasing pressure to find solutions that effectively reduce their total cost of ownership. By deploying storage extension technology that leverages existing network investments and allows more efficient use of bandwidth, you can dramatically lower capital, operational, and bandwidth costs.

CHOOSING STORAGE EXTENSION TECHNOLOGIES

When considering SAN extension technology choices, you must first look at the technical and performance requirements of the applications. Business continuance applications, such as remote disk mirroring, remote tape/disk backup, and server geo-clustering, keep data safe and businesses running during events like earthquakes and power outages. But the strict requirements of these applications require a multi-site storage area network.

Here are the technical and performance requirements you'll need to consider when choosing an extension technology:
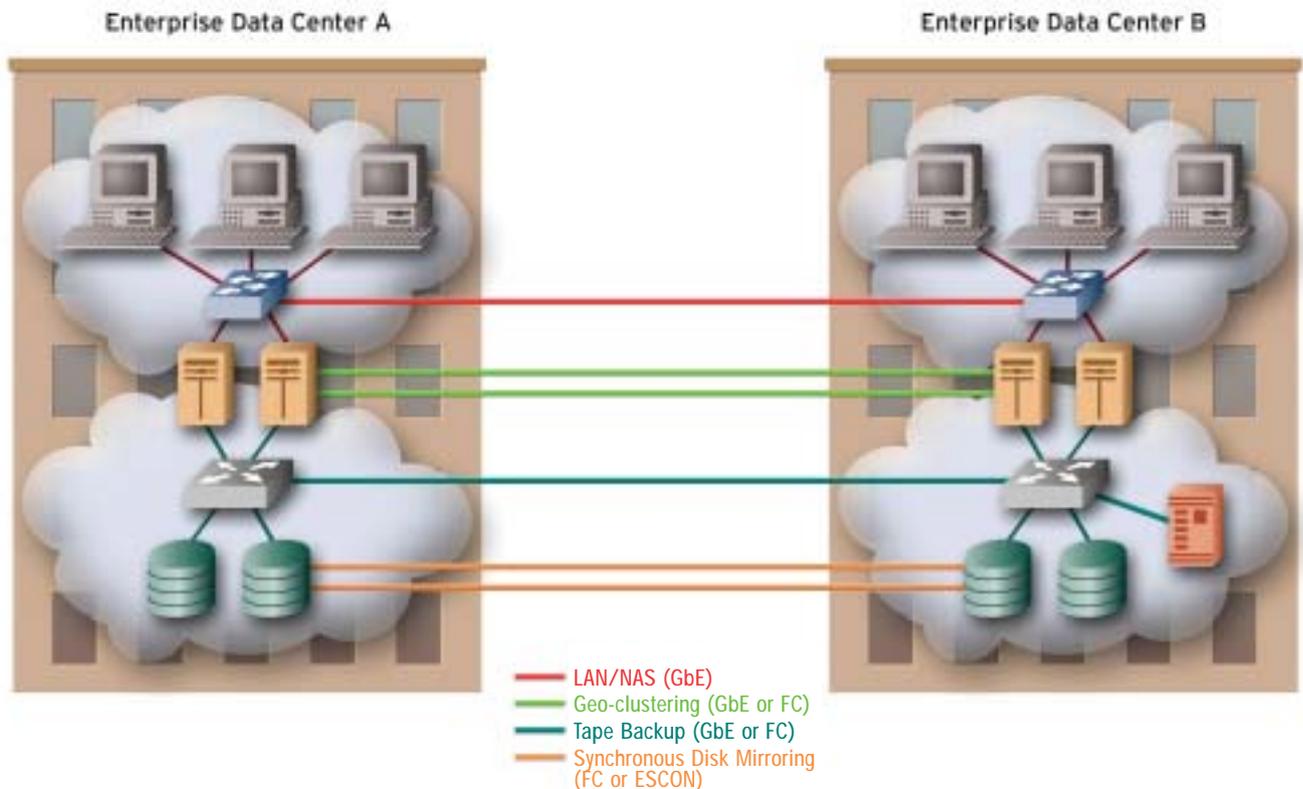
◆ **A flexible architecture** that can handle multiple data center protocols and scale with the growth of a storage network;

◆ **High availability** for maximum uptime;

◆ **Security** so that data is given its own isolated circuit across the network;

◆ **High performance over great distances** for geographical resiliency with no degradation in performance;

◆ **Interoperable** with leading storage systems and assurance of seamless deployment with top storage vendors;

◆ **Extensive monitoring capabilities** that allow the network operator to monitor the performance of applications.

USING SONET FOR LOW-COST STORAGE EXTENSION

SONET (Synchronous Optical NETwork) was developed for high-capacity optical telecommunications and is the primary backbone transmission technology for national and international voice and data carriers. The industry standard, it was designed to let different types of data formats be transmitted on one line and deliver the highest levels of data security, scalability, and cost effectiveness.

A Storage over SONET extension device broadens this capability by connecting disparate applications and equipment. It can meet the service requirements of even

Figure 1: Data Center Connectivity Without a SONET Extension Device

Enterprise Data Center A   Enterprise Data Center B

— LAN/NAS (GbE)
— Geo-clustering (GbE or FC)
— Tape Backup (GbE or FC)
— Synchronous Disk Mirroring
(FC or ESCON)

the most demanding business continuance applications, including disk mirroring, tape/disk backup, and server geo-clustering. Further, companies can meet their storage extension needs largely through assets they already own or lease. Compared to other technologies, a Storage over SONET extension device can reduce total cost of ownership by up to 70% by providing:

◆ **Lowest initial capital costs**—reduces capital costs by 60% by leveraging the existing infrastructure and reducing cost per byte to transport data;

◆ **Reduced bandwidth costs by up to 90%**—enables high visibility and control of network resources and SAN protocols to reduce bandwidth utilization.

◆ **Reduced operating expenses**—allows more efficient use of bandwidth and lowers bandwidth costs by combining the transport of many storage technologies with multiple business continuance applications on a single network channel. A SONET device can also reduce costs by minimizing network downtime. Through advanced performance monitoring, the network operator can rapidly detect and isolate errors to either the local or wide area network.
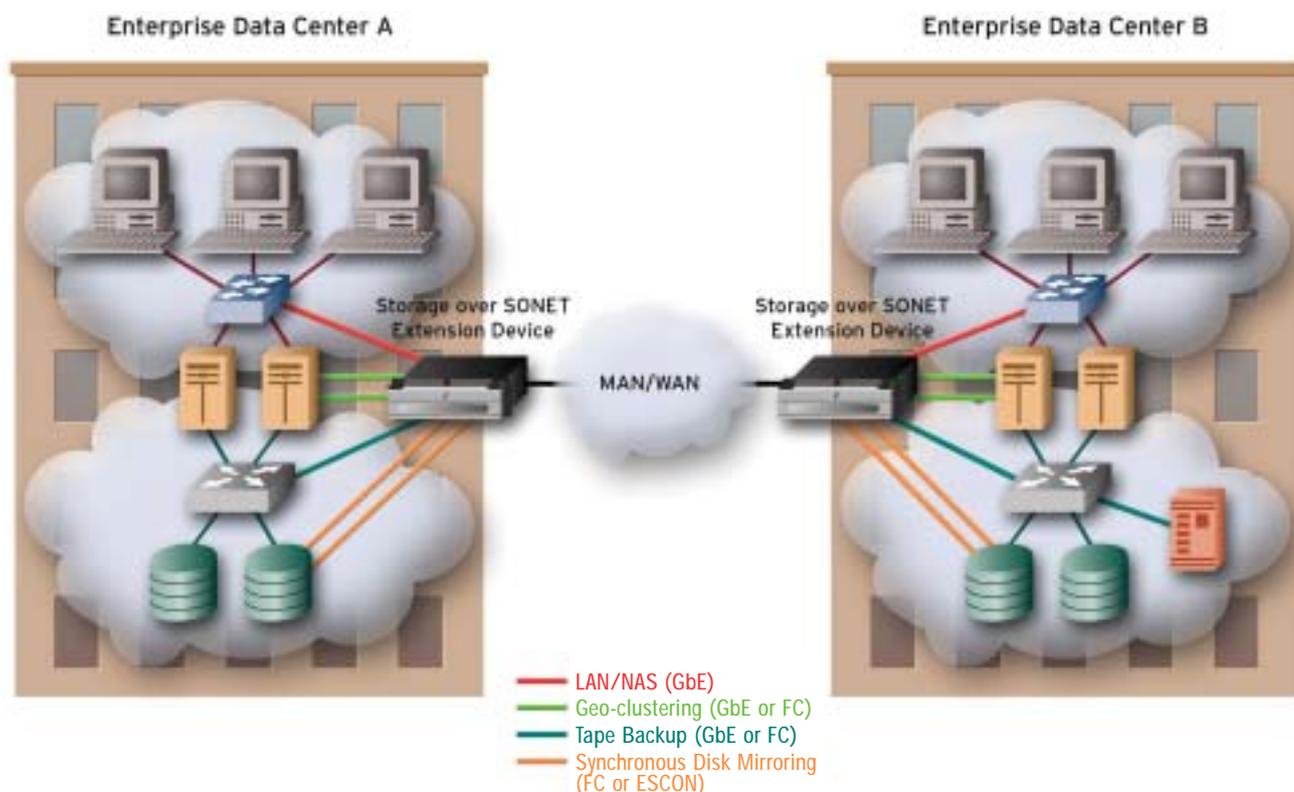
In addition, a company can save about $100,000 in capital costs and recurring bandwidth charges over three years with Storage over SONET vs. IP (Internet Protocol). Unlike the expense of IP storage, Storage over SONET enables lower bandwidth charges because it makes much better use of the available wide area network (WAN) bandwidth.

Right now, companies that want to operate several different business continuance applications must deploy separate, dedicated equipment and facilities. This separation ensures that different applications are isolated so, for instance, tape backup won't interfere with another critical application, such as online transaction processing. But as shown in Figure 1, this solution also requires multiple connections, which results in higher bandwidth charges, complex management, and higher total cost of ownership.

Executives need a solution that supports these business continuance applications on an optimized network connection and provides the bandwidth required by each application while maintaining the critical isolation between different applications to ensure security and performance. As shown in Figure 2, a variety of business continuance applications can be consolidated onto a single SONET connection. This enables a better use of bandwidth to reduce connectivity costs and optimize infrastructure for future growth.

Figure 2: Storage Over SONET for Data Center Connectivity for Business Continuance

Enterprise Data Center A

Enterprise Data Center B

Storage over SONET Extension Device

MAN/WAN

— LAN/NAS (GbE)
— Geo-clustering (GbE or FC)
— Tape Backup (GbE or FC)
— Synchronous Disk Mirroring (FC or ESCON)

USING SONET AS THE STORAGE NETWORK

SONET can also be used as a storage pipeline to transport data between data centers and over greater distances. It and its international version, SDH (synchronous digital hierarchy), are widely used in core network backbones and in networks globally. Analysts estimate that more than 150,000 SONET rings are deployed in North America by carriers and service providers, interconnecting every major urban center.

Because of SONET's ubiquity, over 85% of organizations in North America can immediately access the network today and are probably already using it for their voice (phone) and data networks. Another benefit of using a SONET network is its speed of deployment: It can take less than three months to implement, compared to a minimum of six months for alternate technologies such as DWDM (dense wavelength division multiplexing) or fiber.

DISTANCE EXTENSION CAPABILITIES

Most companies are establishing remote data centers in distant cities or rural areas to protect their data in the event of a natural or man-made disaster, and they are extending their storage among cities around the world over their existing carrier's SONET networks. For the first time, they can successfully extend storage applications over these distances with equipment that can lengthen a data center protocol such as fibre channel (FC) and fibre connection (FICON) to thousands of kilometers while guaranteeing the security and performance of the applications.

PERFORMANCE AND SECURITY

Again, Storage over SONET meets the service requirements of business continuance applications such as remote disk mirroring and tape backup. IP technologies can't achieve the necessary level of security and performance since it is a shared infrastructure. With Storage over SONET, companies can achieve the high level of security and performance required for extending these applications across the network and do it cost effectively. In fact, they are finding that they can reduce total cost of ownership by up to 70% by utilizing a SONET storage extension device that lowers capital, operational, and bandwidth costs. ■

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