SAN Mirroring

Appliance-based replication and instant data recovery solution for data centers and storage systems

Open, scalable solution for SAN-to-SAN and multi-vendor storage system replication and disaster recovery

Today, there are many options for replicating data between storage systems. These include host-based, array-based, and switch-based solutions to name a few. But there have been relatively few choices for storage system disaster recovery (DR), and only slow, tape-based DR methods for protecting and restoring a data center or site — until now. Whether you are protecting data in a data center, SAN, enterprise or mid-range storage system, Vicom's SAN Mirroring solution will meet your requirements with less management and at lower cost.

Vicom's appliance-based SAN Mirroring solution not only provides synchronous data protection for SAN-based storage, but also offers instantaneous failover and instant, automatic data recovery — all without modification of host or storage systems. Using a modularly expandable appliance foundation, Vicom SAN Mirroring replicates data and restores operation for any level of storage configuration from individual systems to large-scale SANs. Moreover, vendor-independent design makes it possible to replicate data from SAN-to-SAN, between storage systems from different vendors, or from one storage tier to another.

High Availability & Instantaneous Recovery

The SAN Mirroring application replicates data by encapsulating the data in the source and target SANs

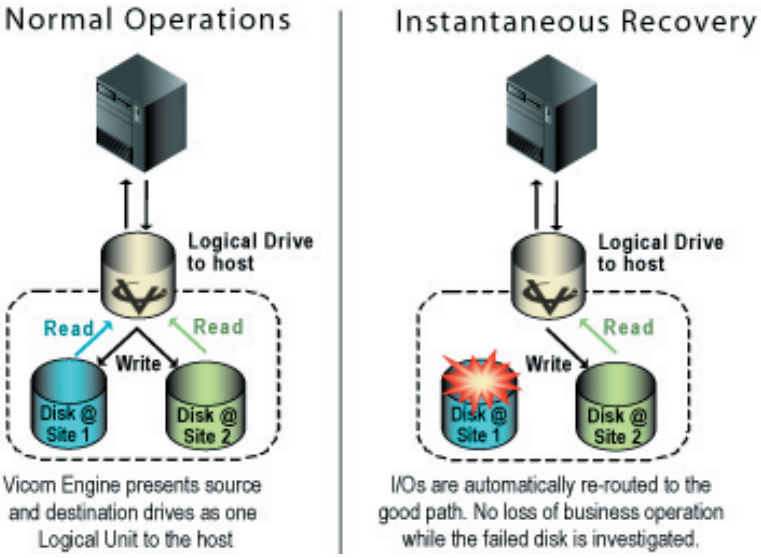
(or storage systems) into two mirrored, logical units. Together, the two units are presented to connected host systems as a single virtual, "unbreakable" disk.

Data written by the host systems is sent synchro-

Highlights

- Synchronous replication and instantaneous, data recovery for data centers and remote or local storage systems
- Open, scalable, multi-path replacement for proprietary disaster recovery and local/remote replication solutions Appliance-based; no host software, agent installation or drivers required.
- Purpose-built appliance boots in less than 10 seconds. Modular scalability with multi-node clustering up to eight nodes.
- Universal compatibility; works with any mix of storage systems, OS, drivers, or switches
- Easy to configure and manage with single point of control
- Provides failover and recovery protection for virtualization and nearly all applications, including IBM SAN Volume Controller, IBM SAN File System, multi-site clusters and parallel database servers.

nously to the two logical units by the Vicom appliance or "Engine." To the host systems, a clustered pair of Vicom Engine modules appears logically as a dual-port, active-active storage system, while from a physical standpoint, Vicom-protected storage systems actually can be located miles apart. In the event of storage unit failure, shift from primary to mirrored storage is made instantaneously and transparently to connected hosts.



If a disk fails, rebuilding of the storage system is performed in the background, without interruption of the host systems. Once the restored, failback is performed automatically and instantaneously. Here, the Vicom Engine synchronizes configuration data with servers and applications through in-band communications. Together, SAN Mirroring's mirrored disk implementation and active-active functionality add transparent, vendor-independent, high availability to attached storage systems.

For replication, SAN Mirroring supports a broad range of host multipathing drivers such as IBM SDD, EMC PowerPath, Veritas DMP, Microsoft MPIO, Sun MPxIO, Qlogic QLDirect, and HP PVLinks. For data recovery from a site failure, Vicom SAN Mirroring also supports clustering servers such as Microsoft Cluster Server for Windows NT/2000/2003, Veritas Cluster Server, IBM AIX HACMP, and HP Service Guard.

Simplified Management and Assured Interoperability

SAN Mirroring is a fabric-based service rendered to connected hosts and storage systems. By providing this service from the storage fabric, the mirroring and disaster recovery can be performed independently of host systems and storage. Vicom centralizes this management under a single management console, eliminating the need to configure and install software or agents across distributed host and storage resources. With this approach, system administrators no longer need to learn multiple applications, operating system conventions, or different types replication services to implement disaster recovery.

To further reduce system administration, SAN Mirroring shields host system operation from storage failures and storage rebuilds. All changes are automatic and fully transparent to connected hosts, whose reads and writes continue without interruption. The Vicom Engine provides centralized support for a wide range of multi-path storage implementations and has the capability to automatically detect active and passive paths.

In an open SAN environment, fabric operation extends beyond physical connection logic. The Vicom appliance platform is built entirely of Vicom-designed software, real-time operating system, and programmable hardware logic. The Vicom design maintains complete control of the OSI protocol stack to ensure seamless inter-device communication and protocol handling. Incorporating experience from hundreds of large-scale SAN deployments, Vicom has identified and resolved subtle system-to-system incompatibilities in timing and communication that arise in multi-vendor SANs. The result: assured, trouble-free mirroring operation and data recovery across SANs, regardless of manufacturer.

Vicom SAN Mirroring software includes:

- Windows-based GUI management tool
- Windows-based Command Line Interface suite
- Telnet to individual Vicom Engine Modules
- FTP to Vicom Engine Module for firmware upgrade and core dump retrieval
- Administrative call-home, e-mail alert for critical event reporting

Scalability

SANs were developed to share resources. Today, this sharing also requires easy scaling to accommodate exponential storage growth. The Vicom Engine,

the SAN Mirroring platform, is built with scalability in mind. The key is a modular, clustering architecture that enables performance and availability to be expanded in building-block fashion; each module is inter-connected by internal, high-speed link and, with multiple Engines, provides a distributed, redundant platform for data management. Vicom Engine clusters can be expanded up to eight Engines per cluster, and may be inserted into a SAN without service interruption.

Scalability in performance and availability also makes SAN Mirroring an ideal complement for large-scale virtualization and clustering products such as IBM's SAN Volume Controller (SVC), SAN File System (SFS) and General Parallel File System (GPFS). For data center applications, SVC, SFS, and GPFS offer virtualized, consolidation of storage and hosts, while SAN Mirroring provides SAN-level data protection of storage resources and instantaneous, site-wide recovery should disaster strike.

Performance and Reliability

The Vicom Engine provides the underlying foundation for SAN Mirroring and other Vicom applications. Because the Engine supports delivery of mission-critical data services, it is designed to provide scalable, high-performance and exceptional reliability. Unlike PC-based appliances, services are neither based on a computer nor functions as one. Instead, the Vicom Engine is a dedicated appliance with proprietary, real-time operating system and customized FPGA design, specifically built to move data at Fiber Channel wire speeds.

Engine design enhances both performance and reliability. For example, high-speed SRAM memory is integrated within the Vicom Engine Module to reduce latency as data moves through the appliance. Cluster design also improves network performance by dynamically distributing data and data paths across multiple storage devices.

To reduce planned downtime, upgrades to Engine firmware can be made online, while also maintaining an option to revert to previous firmware version. In addition, a specialized power-down circuit is included to prevent loss of configuration data and quick retrieval of configuration information after the restart. This allows the Vicom Engine Module to boot reliably within 10 seconds after a power outage.

Ordering Information

000-600VSME-1PMR	SAN Mirroring, Model P	Single Engine	Read/write speed: 90 GB/sec
000-600VSME-2PMR	SAN Mirroring, Model P	Dual Engine	Read/write speed: 180 GB/sec
000-600VSME-1IMR	SAN Mirroring, Model I	Single Engine	Read/write speed: 180 GB/sec
000-600VSME-2IMR	SAN Mirroring, Model I	Dual Engine	Read/write speed: 360 GB/sec

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