White Paper

Managing Multivendor SANs with SAN InSite 2000

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VIXEL

MAKING THE FIBRE CHANNEL CONNECTION

Introduction

The deployment of Storage Area Networks (SANs) by enterprises is expected to grow at a near exponential rate over the next few years. The rapid growth of internet content for e-commerce applications and increasing demand for high availability and data security are driving a wide variety of SAN solutions. This accelerated rate of adoption, however, is predicated on the successful resolution of interoperability and management issues required for mission critical storage applications. Customers must be able to select products that best suit their unique needs, regardless of supplying vendor, and must be able to manage the entire SAN environment with minimal overhead.

Vixel's SAN InSite 2000 management software is a major advance in satisfying these requirements. By providing complete end-to-end SAN transport management and support for multivendor configurations, SAN InSite 2000 allows enterprise networks to confidently deploy SAN switches, hubs, routers, Host Bus Adapters (HBAs) and transceivers and monitor the status of the entire interconnect.

SAN InSite 2000 is the first SAN management application to provide standards-based, advanced management for multivendor SAN environments. Leveraging industry standard SNMP management information for SAN products, SAN InSite 2000 gives the customer comprehensive status and control of the SAN transport. By embracing third party products in addition to Vixel switches and hubs, SAN InSite 2000 expands the scope of visibility into the SAN. And by interoperating with upper layer storage and network management frameworks, SAN InSite 2000 allows SAN transport status to be integrated into the customer's view of the entire network.

The features SAN InSite 2000 offer include standards-based management, auto-topology mapping, multivendor management of diverse products, ease of use, and seamless integration into storage and enterprise management frameworks.

Standards-Based Management

By utilizing the industry-supported Fibre Alliance MIB (Management Information Base), SAN InSite 2000 can provide status and control for Vixel and other standards-compliant SAN products. SNMP management data based on the Fibre Alliance MIB is collected by SAN InSite and reported by web interface or the SAN InSite application. Since management is reported out-of-band over Ethernet (SNMP/IP), SAN status is always available, even if parts of the SAN transport itself are down. This is an important feature, as some SAN device managers use an in-band scheme alone. Just when management is needed most, management data may be unavailable.

In addition to the Fibre Alliance MIB and SNMP/IP protocol, SAN InSite 2000 supports available open standards, including CIM, XML, HTML, CORBA, SES, RMI, Management Server and the standard Fibre Alliance .dll for HBA devices. Standards compliance insures that SAN InSite 2000 will be able to manage a wide variety of SAN products through a variety of management methods and thus scale to customer requirements over time.

SAN InSite 2000 is a Java application and can be run under NT, Windows 2000, Solaris, Linux and HPUX. By porting to Java, SAN InSite 2000 has the ability to migrate to other platforms as well, giving it more flexibility than other management applications. Additionally, SAN InSite's modular architecture allows it to scale over time, embracing more SAN products and providing higher levels of functionality.

Auto-Topology Mapping

The deployment of HBAs, hubs, switches, and Fibre Channel-to-SCSI routers normally implies installation of multiple management utilities, none of which provides a comprehensive view of the SAN. When a component fails, it is often difficult to identify where the problem has occurred and what other devices may be effected. SAN InSite 2000 resolves this problem by automatically discovering all the hardware components of the SAN and drawing the links between them. Auto-discovery also allows the administrator to quickly validate SAN configurations by verifying connections exist where expected.

As shown in Figure 1, SAN InSite 2000 presents the users with an at-a-glance view of the entire SAN (or multiple SAN islands). If a component fails, the status is immediately reported by SAN InSite and the effected links or devices are readily identifiable. SAN InSite's SAN mapping capability allows the user to drill down from an enterprise-level, multi-SAN view to more discrete SAN units at the departmental level. At each level of drill down, more granular data is available, until device and port-level status are shown. In this way, the administrator gets just the information she needs.

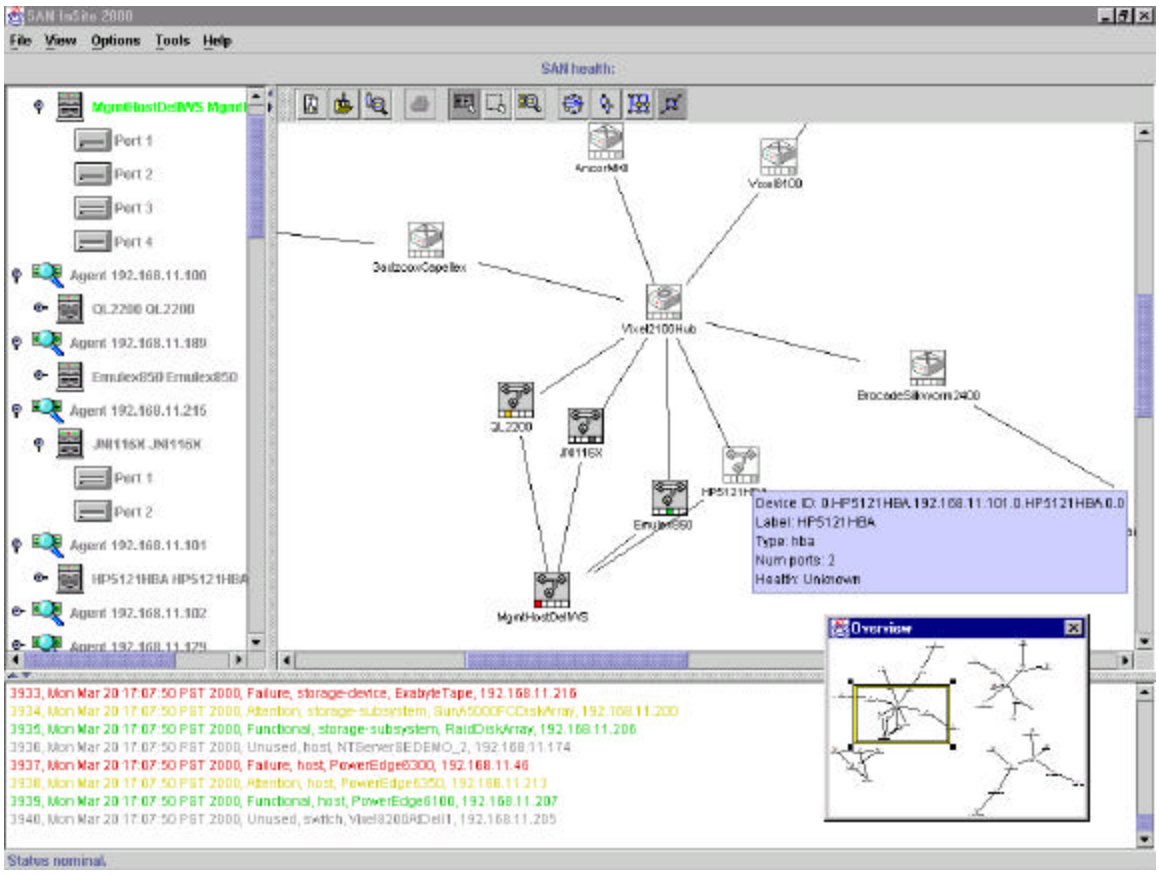

Figure 1 - SAN InSite 2000 Topology View. The SAN administrator has at-a-glance status of multiple SANs, simplified navigation with zoom parameters, and color-coded event log for all managed objects.

Auto-topology mapping provides a powerful tool for SAN administration. SAN InSite 2000 offers four different views of the customer's storage network (circular, hierarchical, orthogonal, and symmetric) that emphasize various relationships between servers, storage and the SAN interconnect. These perspectives give the SAN administrator immediate validation of proper connectivity between SAN components, as well as accessibility of resources across the SAN infrastructure. Intuitive "mouse over" functions provide information on each managed device as well as zoning configuration for individual links. As shown in Figure 2, positioning the cursor over a switch port link, for example, highlights all the other links accessible by that port.

In addition to the topology map, SAN InSite 2000 provides a directory view of managed HBAs, hubs, switches and routers based on SNMP management address. This listing allows the administrator to navigate individual devices and ports and verify status through color-coded legends on each device. Since these devices are discovered automatically, the administrator has a ready list of managed objects that corresponds to the objects displayed on the map view.

Multivendor Management

To date, SAN interconnect products have depended on vendor-specific device configuration utilities. In complex environments, this has meant supporting multiple management platforms, with the additional training and staffing that implies. Each device manager may have a different interface, different management views, and different drill-down techniques. Additionally, some device managers may only run on specific platforms, e.g. NT.

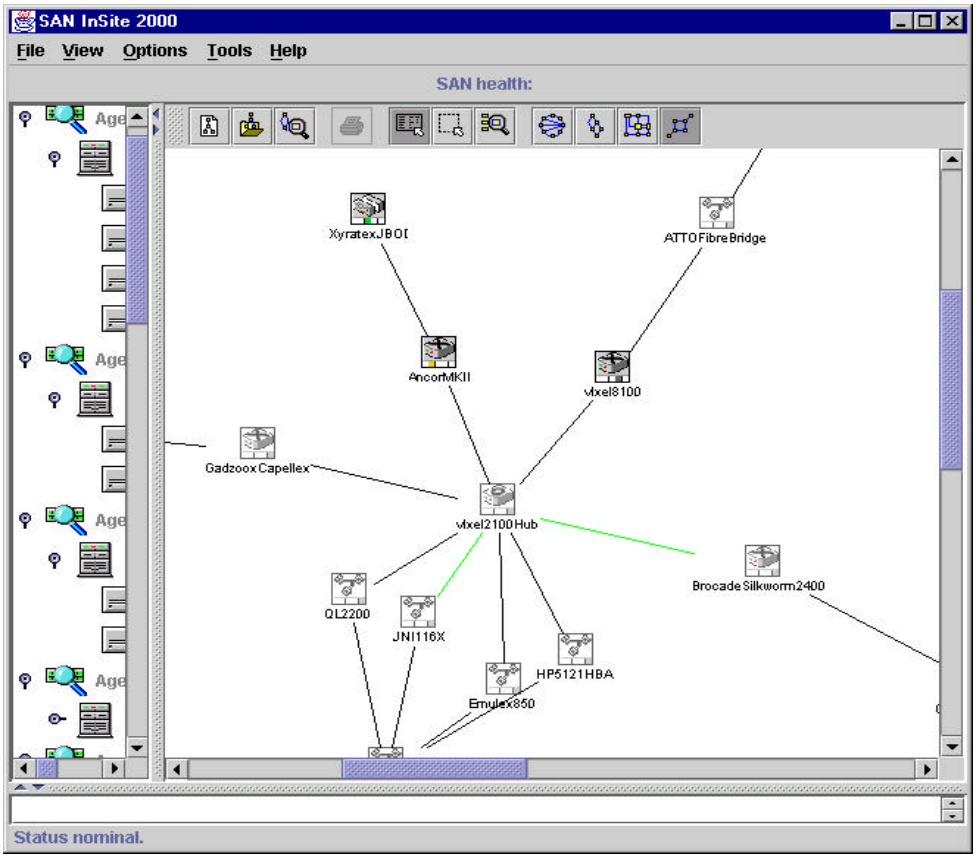

Figure 2. SAN InSite 2000's support for multivendor SAN environments simplifies the administrator's day to day operational requirements. Vendor-specific utilities can also be launched if desired.

SAN InSite 2000 is the first multivendor, Java-based management application optimized for SAN transport management. By enabling management of diverse SAN products from a single application, the customer's overhead for support and diagnostics are significantly reduced. Operators only need to be trained on a single platform, with familiar and intuitive navigation regardless of the specific product being managed. If a device supports advanced features beyond the scope of the standard MIB (e.g., protocol decode on the Vixel 2100 managed hub), the operator can also launch the vendor-specific utility from within SAN InSite 2000.

The ability to support a simplified graphical interface for multiple products and concurrently accommodate vendor-unique utilities is a function of SAN InSite 2000's open architecture. Rather than reduce management functionality to a lowest common denominator, SAN InSite 2000 raises the overall level of SAN management. Instant status of all SAN products in a multivendor environment enhances the administrator's ability to maximize uptime, proactively accommodate bandwidth and performance requirements, and still utilize vendor-specific management applications as desired.

Ease of Use

Although storage area networks may combine complex applications in a single configuration, management of the SAN should be both intuitive and streamlined for the administrator. For example, a SAN that supports both server clustering and tape backup would benefit from a unified management interface that simplifies status and reporting of all active server, storage and tape devices. Problem identification and isolation are greatly accelerated if potential sources can be analyzed at a glance. SAN InSite 2000's easy to use, intuitive graphical interface reduces the management burden on the SAN administrator, even for more difficult, enterprise-level SANs.

Major capabilities that can be performed from the SAN InSite Topology Map include:

- A graphical view of how the SAN devices are connected, physically and logically
- A display of both individual SAN device and consolidated site health
- A view of the interconnection between the topology and directory views to allow for easy navigation
- A display showing performance information from the links of the SAN device
- Four user selectable methods to view the interconnected topology
- The ability to configure zoning of a SAN device (switch or hub) graphically within the topology screen view, while in Logical Mode
- The capability to define and schedule zoning tasks when the update to the topology map occurs
- The ability to launch vendor specific management applications for the SAN device
- Industry standard color coded status of each SAN device
- A customizable event/error log viewing area
- A magnification window allowing for ease of navigation
- "Phone Home" support for automated notification of error conditions

These features allow the SAN administrator to quickly verify status and monitor activity over time. In addition, since SAN InSite 2000 is web enabled, the administrator can manage multiple SAN segments from anywhere in an IP-routed network. Remote monitoring support allows the administrator to always have access to SAN management, regardless of location. In combination with phone home support, the administrator can be instantly notified of major issues and then use a simple web browser to get status.

Integration into Storage and Management Frameworks

To further enhance the ability to detect and manage all aspects of the enterprise from one interface, SAN InSite 2000 seamlessly integrates with upper layer storage management and enterprise management applications. SAN InSite 2000 will integrate with storage management applications from vendors such as Legato and Veritas, as well as enterprise-level frameworks from vendors such as BMC, Computer Associates, Hewlett-Packard and Tivoli. Integration with these higher level frameworks allows the IT administrator to monitor and manage the LAN, WAN and SAN from one common console, a major requirement for large enterprise networks.

SAN InSite 2000's ability to assume multiple personalities makes it an appropriate choice for a wide variety of customers. Medium and small storage networks can use SAN InSite 2000 as their primary management tool. As a stand-alone application, it provides a rich tool set for monitoring the status and performance of the SAN. By integrating with storage management applications, SAN InSite 2000 combines the management of data transport across the SAN with the management of data placement and backup. And by integrating with upper layer enterprise frameworks, SAN InSite 2000 fulfills the enterprise's requirement for full management of all network segments, including the SAN.

Summary

With the introduction of SAN InSite 2000, Vixel is leveraging its core competencies in Fibre Channel SAN expertise and Java-based management software to offer the industry's most powerful, vendor-neutral SAN management application. As the first advanced SAN management platform, SAN InSite 2000 offers customers the following key benefits:

- Standards-based management for open systems interoperability. As customers employ additional standards-compliant SAN products, SAN InSite 2000 can scale to accommodate customer needs.
- Auto-topology mapping. SAN InSite 2000 simplifies device discovery and allows the customer to quickly verify proper connectivity and access to SAN resources.
- Multivendor management of diverse products. SAN InSite 2000 provides the umbrella SAN management platform and eliminates the need for multiple management workstations and overhead.
- Ease of use. By streamlining the user interface, SAN InSite 2000 allows the customer to manage complex SAN environments with simple point and click navigation.
- Integration into storage and enterprise management frameworks. SAN InSite 2000 scales to the customer's management needs, from small, departmental SANs to enterprise-wide applications.

The power of SAN InSite 2000 makes it the SAN management tool of choice, regardless of hub, switch, HBA or router vendor. In combination with advanced performance and diagnostic tools engineered into Vixel 2100 managed hubs and Vixel 7000 series and 8100 series fabric switches, Vixel can offer a superior solution for both SAN management and high performance connectivity.

About the authors:

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