Managing Small- to Medium-Size SANs with EMC VisualSAN

As storage area network (SAN) technology advances, many organizations are realizing the benefits of consolidating departmental and workgroup storage into a SAN. EMC® VisualSAN® is a management tool designed explicitly for small- to medium-size SANs, particularly those that support the nonessential services of departments and workgroups.

BY KEITH R. KAMMER

Storage area networks (SANs) offer IT departments an appealing return on investment (ROI). Many organizations use SANs to support core applications, but use direct attach storage for distributed servers that run nonessential services, such as file-and-print management and Microsoft® Exchange Server software. By moving the storage on these distributed servers to a SAN, organizations can achieve reduced management costs, better utilization of assets, and improved data security.

However, consolidating the storage of distributed servers is not without its challenges. Companies that develop SAN management tools tend to focus on enterprise-level SANs. They create tools that are often too large and complicated for managing a small- to medium-size SAN. These tools are also quite costly, making this type of SAN financially impractical for many companies. Some organizations rely on multiple device management tools to manage smaller SANs, but those tools usually fail to supply all the necessary management information to support the SANs.

The EMC® VisualSAN® software suite heralds a new era in SAN management. Designed for small- and medium-size SANs, VisualSAN provides all the required tools for managing a SAN and also includes a simple, intuitive user interface. It provides tools for performance and configuration management as well as for easier SAN installation and improved troubleshooting support.

A simple approach to SAN management

VisualSAN provides a user-friendly, centralized console for management of the SAN. Although designed for small- and medium-size SANs, VisualSAN is highly scalable and can support enterprise-class SANs. It supports all Dell™ PowerVault™ and Dell|EMC storage devices in the SAN.

Discover and represent devices within the SAN

VisualSAN uses in-band and out-of-band discovery techniques to identify all devices in the SAN. It distributes agents throughout the environment to gather information at a sublevel and then report back to the management station. By deploying these agents, VisualSAN circumvents performance degradation and facilitates greater scalability.

The special Discovery Modules within VisualSAN support Dell PowerVault and Dell|EMC storage devices and supply detailed information about the devices and their status. For non-Dell devices discovered in the SAN, VisualSAN allows users to manually specify information about the devices. VisualSAN uses industry-standard application programming interfaces (APIs) and Simple Network Management Protocol (SNMP) to deliver information during discovery.

The VisualSAN user interface displays SANs—both physical and logical devices—in a tree structure and in a

topology map (see Figure 1). Physical devices include not only those at the device and interconnect level, but also the host bus adapters (HBAs). Logical information includes zoning. Using these physical and logical device representations, administrators can isolate events and identify problems in the environment. The topology map provides a quick visual reference for detailed device information, including event and performance statistics.

Monitor events within the SAN

The availability of a SAN depends on the health of the devices within it. Continuous SAN operation requires monitoring the physical devices to identify those that may fail or become critical. Monitoring the logical environment helps to identify capacity availability and performance issues. VisualSAN provides physical- and logical-level event management for all PowerVault and Dell|EMC devices and Dell PowerEdge™ servers. Administrators can choose to view system events in a consolidated table or by individual device.

VisualSAN provides the choice of setting alerts for all events and devices or for only certain types of events or devices. It can send these alerts to a specific e-mail address or IP address and at a specific time. To provide a direct visual reference to problems, VisualSAN propagates warning and critical events to the topology map.

Report on assets in the SAN

VisualSAN provides preset SAN-device reports that offer useful information for asset management and troubleshooting. The VisualSAN custom report generator enables users to create a specific report based on selected data.

Manage devices from a centralized console

A SAN management console provides a central location for managing devices in a SAN. To effectively manage these devices, the administrator must perform several tasks:

- Create logical unit numbers (LUNs) and volumes
- Configure RAID
- Set up LUN masking and mapping
- Create zones
- Expand capacity, virtual disks, and volumes online
- Perform physical management of arrays, HBAs, switches, and disaster recovery solutions
- Configure failover paths and load balancing
- Manage tape devices, libraries, and tape backup

VisualSAN is fully integrated with EMC Navisphere® management tools and Dell PowerVault management tools to handle these tasks. These device management tools launch in context to the devices selected either through the topology map or the tree structure. In addition, VisualSAN is integrated with Dell OpenManage™ Server Administrator to enable the management of Dell PowerEdge servers.

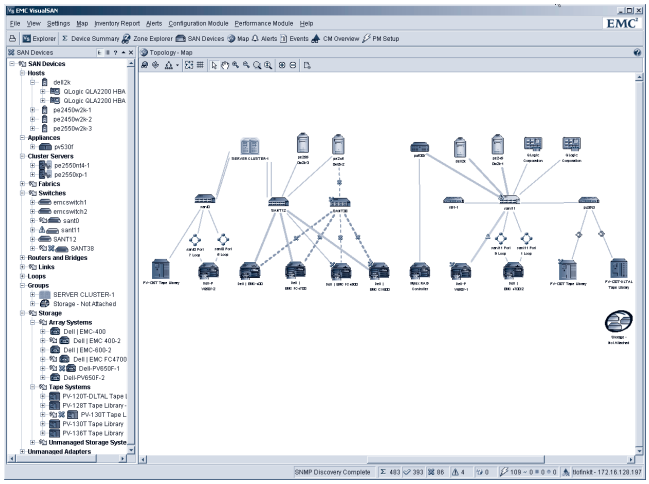

Figure 1. VisualSAN tree structure and topology map

Create zones within the SAN

A key element of SAN management is zoning devices to specific servers to maintain security. Like many other SAN management programs, VisualSAN offers this capability with Brocade® switches. Administrators can create a zone using a zoning wizard or the topology map (see Figure 2), in which case they select the device to be zoned, right-click on the device, and assign a zone name. Zones can be defined either by worldwide names or the specific port of the switch.

VisualSAN provides an additional level of zone management by displaying zones in the topology map. Administrators can see possible zone overlaps and no longer need to correlate worldwide name addresses or port addresses manually.

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A distinct tool for managing SAN configurations

Problems that occur in a SAN can originate from one of two areas: a failed device or a change in the SAN. If a SAN device fails, events from the device identify the problem location, and the event management capabilities of VisualSAN can help administrators solve the problem quickly.

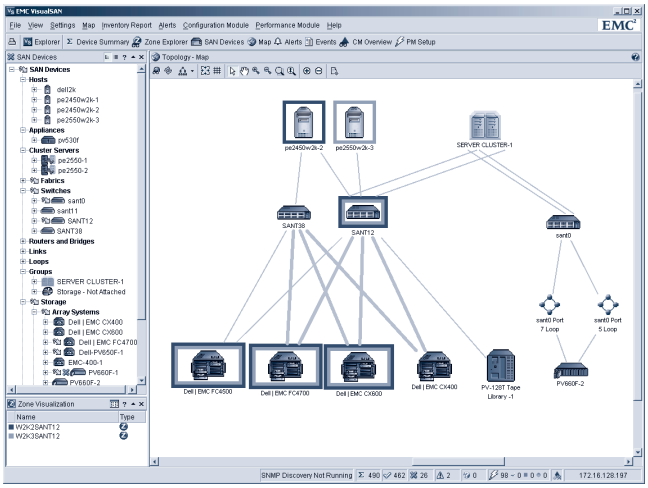

Figure 2. VisualSAN topology map with zone visualization

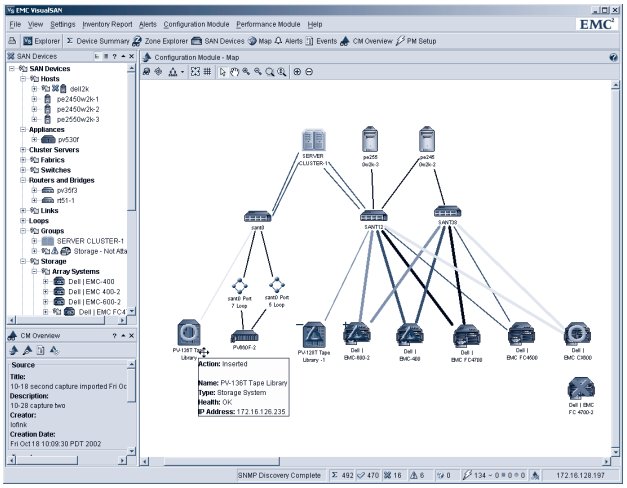

Figure 3. VisualSAN Configuration Manager topology view

Every change made in a SAN can have an adverse effect. In fact, simple changes made in an effort to optimize a SAN configuration often backfire, initiating a cascading effect that brings down a significant portion of the SAN, if not the entire network. Aberrations within the SAN can even manifest days or weeks after a simple change has been made.

Dell offers a solution to change management in the SAN—the VisualSAN Configuration Manager, an integrated, add-on component of VisualSAN. The VisualSAN Configuration Manager enables organizations to automate change management. Using this tool, administrators can capture a visual image of the SAN at any point in time (see Figure 3). They can define the objects or devices to be included in the image, as well as the device details to capture, such as device firmware and serial number, LUN information, zone configuration, worldwide node name, software and firmware levels, driver information, and any other information that directly affects SAN operation. Administrators can also use the VisualSAN Configuration Manager images to keep change logs, manage assets, and replicate configurations.

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Troubleshoot with configuration images

When a SAN is running at peak efficiency, VisualSAN can capture a "good," or baseline, image of the SAN. This baseline configuration allows administrators to identify and analyze future changes made to the SAN configuration. When a problem that cannot be traced to device failure occurs within the SAN, VisualSAN can capture a "bad" image. The VisualSAN Configuration Manager can then provide a comparison of the two images to help administrators identify changes in the SAN that may have caused the problem. The SAN administrator using VisualSAN without the Configuration Manager add-on component can send both the bad and good images to Dell Technical Support for problem identification and analysis.

The VisualSAN Configuration Manager graphically and textually flags any additions or deletions of SAN devices and any changes to existing SAN devices. With the graphical representation, visual cues immediately direct administrators to areas where changes have been made; in the text report, administrators receive specific details on additions, deletions, or modifications.

The ability to compare two different configurations of the same SAN can be a powerful troubleshooting tool. Administrators can fix a problematic SAN by rolling back to the baseline configuration. This capability can reduce SAN downtime and any associated service calls and technical support costs.

Keep track of configuration changes

In a never-ending cycle to improve performance, expand capacity, and use assets to their fullest extent, administrators must continually update the hardware, software, firmware, drivers, patches, and service packs. Many SAN administrators manually keep logs of revisions made to the infrastructure. When properly implemented, logging the change management process ensures tight control over all SAN updates. However, logging this process can also slow down routine maintenance, and administrators may overlook seemingly insignificant changes.

Administrators can easily tailor the change process through the VisualSAN Configuration Manager scheduler, which automatically logs images of SAN configuration changes. Automated logging enhances routine maintenance and prompts administrators to follow an established change process that can be audited and tracked. The Configuration Manager logs detailed information about each configuration change, including the date and time of the change. This process can result in a better-managed SAN with higher availability.

The VisualSAN Configuration Manager enables organizations to automate change management.

Manage assets in the SAN

As the complexity of the SAN grows, so does the amount of time administrators must spend tracking inventory and assets, a task that distracts administrators from managing the performance and availability of the SAN. This redirection of efforts limits a company's ROI by underutilizing administrators' talents. Administrators need a SAN management tool that quickly and transparently captures asset inventory, allowing them to concentrate on delivering performance and availability.

The configuration images captured by the VisualSAN Configuration Manager can become an automated method of asset management. The module can report detailed asset information, including serial numbers, asset tags, firmware levels, software levels, worldwide names, and TCP/IP addresses. Automating the collection of asset information frees administrators from the manual, time-consuming, and error-prone process of tracking assets so that they can focus on SAN performance and availability. As a result, companies can achieve more gigabytes of data per storage administrator and a better return on SAN investment.

Replicate configurations in multiple locations

The VisualSAN Configuration Manager addresses another SAN configuration need: replication. When a large enterprise organization needs reliable SAN configurations in multiple locations, it often tests a standard configuration in a controlled lab environment before deployment. The organization then replicates the lab-tested configuration in several locations.

Successful replication requires careful, disciplined control of the hardware and software configuration, even down to the firmware levels on hardware devices. Such control can significantly decrease support costs. It can also decrease spare-part inventory costs because organizations can stock fewer components.

The VisualSAN Configuration Manager enables organizations to replicate these desired lab-controlled SAN configurations more easily. Its import and export utilities simplify SAN replication and enable administrators to compare configurations for accuracy. The module also provides device-specific information, such as firmware and software driver versions, for more precise control of replicated deployments.

An alternative to direct attach storage

Enterprise organizations seeking to replace direct attach storage with small- to medium-size SANs now have a suitable management tool. VisualSAN incorporates key SAN management capabilities: discovery, representation, event management, reporting, device management, and zoning.

Armed with the Configuration Manager, VisualSAN also allows organizations to manage changes within the SAN configuration and achieve maximum ROI from their SAN environments. With these tools, enterprise organizations can reduce costs, optimize asset use, and simplify their storage management.

Keith R. Kammer (keith_kammer@dell.com) is a senior product marketing consultant with the Systems Storage Group at Dell. He has more than 20 years of experience in the storage industry from working with Burroughs, Unisys, and Dell. Keith has a B.B.A. in Finance from Walsh College of Business and Accountancy in Troy, Michigan, and an M.S. in Administration from Central Michigan University.

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http://www.dell.com/us/en/esg/topics/products_software_pedge_storage_config.htm#partner7

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