



Veritas SANPoint Control – Untangling the Web of Networked Storage

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Management Summary

Imagine what life would be like without our nation's system of highways and interstates. It would be difficult and very inconvenient to transport goods, travel to a remote destination, or even just drive to work for many commuters. We all depend on it and probably take it for granted. We also pay to maintain and operate that vast *network* through taxes and tolls. Authorities must patrol it with troopers, repair it when worn down, plow and sand it in the winter (certainly if you live in New England, anyway), and expand it as the population grows and traffic flows increase. **This may be costly and complex, but it's worth it.** Nobody wants to go back to cow paths and country lanes.

Storage networks are similar. Many enterprises have come to depend on and enjoy their benefits – management is easier than with silos of direct-attach storage, resource utilization is higher, backup and recovery is faster, and TCO is lower. All good things, even though there are significant complexities involved in operating these networks, especially as the number of devices, vendors, interconnections, and interdependencies grow. It's not easy, but, like the highway system, nobody wants to go back to the old way. **The good news is that storage management software can untangle the web of networked storage, ease management, and help deliver better service levels to applications and users.**

This is where Veritas *SANPoint Control* (SPC), with its companion solutions *Storage Reporter* and the upcoming *Service Manager for Storage*, come into play. **SPC performs discovery of end-to-end, heterogeneous SAN resources, topology mapping, monitoring, reporting, provisioning, and policy-based management.** It supports a wide variety of devices, vendors, and models, making it a likely “fit” for many enterprise data centers.

Furthermore, *Storage Reporter* complements SPC by providing file scanning, usage reporting, and duplicate file discovery. Both will integrate under *Service Manager* (already in beta), which defines, delivers, reports, and accounts for storage as a service, in a utility-like manner.

The business benefits of Veritas' storage management software include lower operating and acquisition costs as well as better application performance and availability. Read on for details.

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Service Levels and Data Paths

Take a deep breath, clear your mind, and picture this – **storage is not just a box anymore, it's a service.**¹ This is like the difference between a power plant and a home electrical outlet, or a telecommunications network and a long-distance plan. As consumers, we appreciate and experience the service delivered to our doorstep. **Similarly, applications and users experience storage as a *quality of service*.** In broad terms, this translates to:

- *Performance* in MBs or I/Os per second
- *Availability* in percentage of uptime,
- *Recoverability* in time to restore, and
- *Cost* per unit of capacity.

The box of spinning disks, while essential, is faceless infrastructure to the consumer, like the power lines we always drive by but never notice.

The next big realization is that the end-to-end data path² delivers the service. From an individual disk drive to a RAID group, storage controller, cables, switches, host bus adapters (HBA), volume manager, file system, operating system, and application – every point along the way affects the quality of service. Data travels a convoluted path through many physical and logical devices in a storage area network (SAN).

Finally, an administrator must coordinate and manage all of it. He or she is responsible for delivering the right quality of service to the right constituents. However, it is not enough to manage just one point along the way, nor is it enough to manage all points in isolation, not considering the upstream and downstream effects. In fact, storage quality of service in a

network depends on the proper balance and maintenance of the entire data path, from start to finish. And the heterogeneity found in many enterprise data centers only adds to the complexity.

If this sounds like a lot to handle, *it is*, even for a talented and skilled administrator. Considering also how important data storage is in a modern enterprise, it is no wonder there is so much buzz around storage management software. **There is a need for a single point of management that monitors, reports, coordinates, and controls the whole networked storage infrastructure.**

Veritas SANPoint Control

Veritas designed *SANPoint Control* (SPC) to address this need – to manage the complexity of storage area networks (SANs) and deliver storage as a service. SPC takes under its management umbrella a wide range of devices, models, and vendors, reflecting the many components that comprise a SAN and the diversity found in enterprise data centers. It can also analyze and coordinate individual data paths, from the LUN (logical unit) to its associated application. Capabilities include:

- **Topology mapping** – Automatically discovers SAN devices and maps relationships and interconnections. The first step in SAN management is simply understanding what is there, and this feature can save a lot of time and tedium by tracking and graphically portraying a SAN environment, even as it changes on a regular basis. No more out-of-date Excel spreadsheets!
- **Real-time monitoring** – Like the cockpit of an airplane, SPC continuously monitors device performance, utilization, availability, errors, and so forth. This allows administrators to take corrective or even preventive action in order to maintain storage availability and performance.
- **Reporting** – Tracks and presents SAN statistics in a variety of reports. These are useful for capacity planning, accounting

¹ See *Storage Is Not Just a Box Anymore – Managing the Data Path* in **The Clipper Group Explorer** dated April 7, 2003, at www.clipper.com/research/TCG2003013.pdf.

² From the server or user to the disk(s) on which the data is stored.

and charge-back³, inventory, troubleshooting, and performance tuning.

- **Partitioning and securing** – In a shared, networked environment, securely allocating storage to hosts is a necessary function. SPC takes care of this by performing LUN binding, LUN masking, and zoning in supported storage arrays and switches.
- **Provisioning** – “Many report, few provision” is a truism of storage management software. Both capabilities are important, but the ability to *see* and *act* separates the men from the boys, so to speak. Automating the chain of events necessary to provision storage to an application saves a lot of time (and therefore expense) and helps avoid human errors. In this process, SPC can perform LUN discovery, LUN binding, LUN mapping, zoning, and non-disruptive expansion for Veritas Volume Manager and File System, if these applications are running. It can also launch third-party device managers “in-context” from its console, allowing administrators to perform more granular configurations.
- **Policy-based management** – Through a wizard, SPC can set policies that trigger specific actions when events occur. Potential actions include sending e-mail, issuing SNMP traps, alerting the console, and running a batch file or script. For instance, SPC could alert an administrator via e-mail if the utilization of a switch port gets too high, or it could provision additional storage to an application via a PERL script if an out-of-space condition is about to occur. **Policy-based automation is the icing on the cake of storage management, since it builds on top of capabilities in monitoring, reporting, and configuring and further simplifies administration.**

As mentioned, SPC supports a variety of

SANPoint Control Architecture

The architecture consists of three components. The SPC *Console* is the client application that provides a centralized, graphical interface. The SPC *Server* is the “workhorse” that connects to the SAN fabric and performs discovery, monitoring, reporting, and configuration. It captures information in a database for reporting purposes. Both the server and console run on Solaris or Windows 2000. Furthermore, SPC agents run on host servers in order to provide information about the operating system and applications. Otherwise, it will only discover a server’s HBA.

SAN devices, including storage arrays (SAN- or direct-attached), switches, bridges, tape systems, HBAs, host operating systems, and applications. Supported array vendors include HP/Compaq, EMC, Hitachi, and Sun. SPC supports switches from Brocade, McData, InRange/CNT, and Qlogic, and HBAs from Emulex, JNI, Qlogic, and HP/Agilent. The host operating systems it works with are Windows 2000, HP-UX, AIX, and Solaris, with Linux expected later this year. Finally, the supported applications include Oracle, Microsoft *Exchange*, and Veritas *Volume Manager*, *File System*, *NetBackup*, and *Cluster Server*.

Any storage management software that you are considering should be able to support the devices in your enterprise’s SAN, or at least the ones you want to manage. Openness and heterogeneity are beneficial to enterprises, but from a vendor perspective, it takes a Herculean effort to test and qualify the many combinations and permutations of devices, vendors, models, and firmware versions that SAN management software must support. This fact tends to favor large vendors with the resources to dedicate to this ongoing effort. In any case, be sure to check with Veritas about support for the models, firmware versions, and features in your environment.

³ See *The Accounting Pendulum Swings at Storage (or, Why The Taxman Cometh?)* in **The Clipper Group Explorer** dated October 31, 2002, at www.clipper.com/research/TCG2002043.pdf.

Complements and Futures

Complementing SPC is another Veritas solution called *Storage Reporter*. It falls into the category of classic storage resource management (SRM) and offers deeper capabilities for file scanning, usage reporting⁴ and charge-back, duplicate file discovery, and capacity planning. Veritas will also acquire additional SRM technologies from its pending acquisition of Precise.

Furthermore, Veritas plans to bring all of these products together under a common interface called *Service Manager for Storage*. This product, which is already in beta, will define, deliver, report, and account for storage resources as services, in a utility-like manner.⁵ Users request particular service levels, and Service Manager manages the process for meeting them. **It will be the capstone solution that delivers utility computing at the highest level – where IT interfaces with business processes.**

In short, Veritas intends to create a broad solution for open, end-to-end, centralized storage management.

Benefits to the Business

While SPC makes the life of a storage administrator more productive, the greater benefit is the economic impact to the enterprise. These include:

- **Lower operating costs** – By automating much of the tedious, repetitive work, it allows each administrator to handle much more storage capacity. This is a major benefit because operating costs, especially management, are many times the acquisition cost of storage over its useful life.
- **Lower acquisition costs** – The ability to discover, correlate, provision, and reallocate storage resources allows enterprises to use capacity more efficiently. They do not need to buy and carry as much storage

“headroom” or wasted space. Open management also makes it easier to deploy tiered storage classes and, therefore, a more rational storage mix. For instance, administrators can assign the most robust storage to mission-critical applications and less-costly storage to others.⁶

- **Improved application performance and availability** – By enabling more consistent storage qualities of service and reducing the potential for inadvertent errors, (e.g., “Oops, wrong port!”), an enterprise can expect better application performance and availability, and ultimately more productive business processes. And isn’t that what it’s all about?

Conclusion

If you feel the need to get your arms around storage, reduce complexity, and manage it more cost-effectively, you’re not alone. This situation is just a byproduct of the Information Age. Fortunately, the storage industry recognizes this need and is developing solutions for it. **Veritas SANPoint Control is further along than most, and its open, end-to-end, centralized approach to networked storage management is attractive, especially for more complex data centers.** If you are in the market for storage management software, be sure to have a look at Veritas.



⁴ Ibid.

⁵ See *The Veritas Renaissance – Setting Its Sights on Utility Computing* in **The Clipper Group Navigator** dated May 20, 2003, at www.clipper.com/research/TCG2003022.pdf.

⁶ For more details, see *Tiered Storage Classes Save Money – Getting The Most Out Of Your Storage Infrastructure* in **The Clipper Group Explorer** dated August 29, 2002, at www.clipper.com/research/TCG2002030.pdf.

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