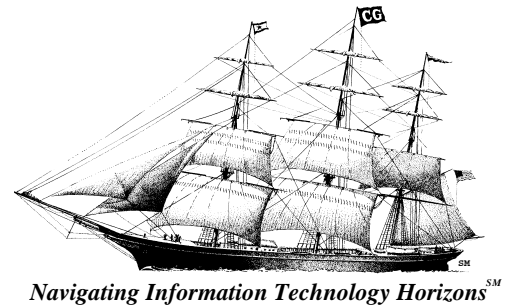


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Fulfilling the Promise of Storage Area Networks - InterSAN's *Pathline* Storage Area Manager

Analysts: Anne MacFarland, Joe De Natale and Michael Fisch

Management Summary

Most large enterprises today have adopted storage area networks (SAN) to support the rapid increase of information. Data pertaining to customers, products, business processes – all critical to running a business and maintaining its competitive advantage – is pouring in at ever-increasing rates. IT departments are relieving the pressure by consolidating storage and connecting it to servers over a common storage network. **More than a new storage interconnect, a SAN is fundamentally a promise to deliver information storage more simply, robustly, and at the lowest possible cost.** Though SANs are delivering much value today, the full weight of this promise has yet to be fulfilled.

The concept of a SAN is not the problem. While it is inherently more complex than direct attached storage, SANs utilize storage capacity more efficiently and manage it, particularly as it grows, more effectively. The elements of a SAN are well established. Best practices have been determined. Interoperability is there or forthcoming.

The roadblock to reaching the full potential of a SAN is one of coordination and control. SANs consist of not one device, but many connected together, like a stagecoach with a team of horses. The objective of the stagecoach driver is to manage the horses to get them pulling in the same direction and speed. Most management software packages today manage the horses individually; that is, they focus on discovering and monitoring devices. However, **business needs, embodied in applications, require a more comprehensive assessment, because, in a SAN environment, applications are not device-centric.** The data path for an application server may involve multiple storage arrays, multiple switches and multiple servers. From this point of view, the SAN can be not like a stagecoach but like a bevy of unharnessed circus horses. To manage storage and switches from an application perspective, an administrator may have to be a circus rider - dancing from one back to another, fumbling for the right set of reins. If the horses are rowdy, or if there is a mismatch in speed or direction, things will go badly.

What is needed is application-centric management to unite the many sets of reins, so that a single tug will redirect all the horses, and a harness of policy management and automated provisioning to automatically coordinate relationships between individual devices, so that applications can be up and running and not squirming in the sawdust. Of course, it won't be a circus act then, and the gasps of fear and incredulity will disappear. But heroics were never the requirement; it's all about better management of resources.

In fact, such a solution is now available: InterSAN's new *Pathline* storage area management software promises to rein in the SAN with automated, end-to-end management from the application through the storage devices. *Pathline* uses the concept of the *Virtual Private DataPath* to monitor, manage, and configure all data path devices from the application perspective. This holistic approach to SAN management better synchronizes information technology with business needs, thereby extending the value of the SAN.

Read on to see how *Pathline* adds much to fulfill the whole promise of the SAN and delivers an impressive return on investment.

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The Clipper Group, Inc. - Technology Acquisition Consultants ♦ Strategic Advisors

888 Worcester Street ♦ Suite 90 ♦ Wellesley, Massachusetts 02482 ♦ (781) 235-0085 ♦ (781) 235-5454 FAX
Visit Clipper at www.clipper.com ♦ Send comments to editor@clipper.com

A Broader Perspective: Business Processes enabled by Policy Based Management

First generation SAN management software has approached automated management by using scripting to customize and automate responses for different customer situations. Wizards can ease the tedium of this, but this approach still doesn't scale very well. **InterSAN's Pathline takes a policy-based approach.** Pathline comes with a set of best practice policies. Many customers will find these quite satisfactory. These policies can however be modified and new policies can be easily created.¹ And InterSAN has a professional services team to help, if needed.

Pathline creates Virtual Private DataPaths that link allocated resources to the application to which they are assigned. Pathline differentiates itself from other vendors who only monitor devices by making allocations and changes based on customer-tailored policies. Pathline automatically provisions storage, transparently configures and enforces security and reports on service levels based on customer-tailored policies. **This policy-based automation endows Pathline with quick and measurable ROI.**

Pathline's Return On Investment

The business benefits of Pathline are many. Although many vendors' products do vendor-neutral automatic discovery and create a view of the topology of the SAN infrastructure, Pathline goes further.

- Pathline can measure the availability that SAN infrastructure is providing an application to determine if it's meeting policy-specified availability goals.
- It can automatically provision incremental storage capacity when an application requires it.
- Furthermore, Pathline can enforce end-to-end security in the SAN.

These capabilities allow customers to extract more value from their investment in SAN infrastructure.

Pathline allows the enterprise to set different processing and availability goals for different applications, so that the most important ones get the resources they need. In this way, service level

¹ InterSAN has a professional services organization that can help customers analyze their needs and customize the policies to those needs

What Is Storage Area Management?

Moving storage to the network demands management beyond discovery and monitoring of devices.

- Policy-based management
- Automated Provisioning of new devices
- Linking of applications and servers to "owned/used" storage resources
- Ongoing reallocation of resources
- Service level management
- Allocation of paths (and, eventually, bandwidth) in the fabric connecting servers and storage

agreements for different applications can be met and maintained. Applications that require five nines of service² will achieve that goal, while those of lesser requirements will not. This is a significant cost saver, allowing customers to deploy extremely robust enterprise-level storage for mission-critical applications while using less costly storage for other applications. Pathline also handles multi-vendor SANs, providing customers maximum flexibility and leverage of storage assets. Pathline's policy-based automation can gather the information needed to enable the deployment of very efficient, cost-effective two-tiered storage environments.³

Pathline's policy-based orientation gives it an inherent ability to scale upwards. This means that as the system and applications grow, Pathline can automatically adjust to the new requirements for storage infrastructure usage, and do it without the necessity of adding personnel to manage the changed system. **The use of pre-defined policies minimizes the need for experts to administer the SAN infrastructure.** InterSAN claims that it will take fewer and less technically specialized personnel than for currently available SAM software systems. **This is the most significant area of savings because the costs of network and storage administrators are by far the largest variable cost of SAN ownership and where Pathline delivers on its ROI promises.**

When difficulties arise in the storage area infrastructure, or if service levels are not being met, Pathline notifies the administrator so that remedial action can be taken to keep the desired level of

² 99.999% uptime.

³ Premium storage where required: volume-priced storage for already-backed-up static data and other data that does not need premium storage's advanced functionalities.

service to the users. First generation SAN management systems require a deep knowledge of the SAN infrastructure and the business processes by highly trained personnel. **Pathline provides business relevant views that clearly identify the affected business process.** Again, it lowers the bar in terms of the competency levels for administrators.

The management and enforcement of security in the SAN is also automated. Once security policies are defined, Pathline configures devices accordingly during provisioning and continually monitors them to ensure consistency. This end-to-end approach, safeguarding an enterprise's vital information, cannot be achieved without policy-based automation.

Pathline's SAM solution brings sizeable benefits to the enterprise, making the return on investment substantial. Besides the savings in administrative personnel costs, which InterSAN states can be up to 60%, reductions in capital investment in the SAN infrastructure of up to 20%, and a 10% reduction in downtime, all make Pathline a serious contender for managing storage networks.

How It Works

Pathline software runs on an out-of-band Solaris platform, avoiding potential performance or availability issues caused by placing equipment in the data path. On the management platform, each application is defined as an object mapped to the server or servers on which it resides. The only outboard elements that Pathline uses are optional "Path Adapters" (agents) on application servers.

Pathline automatically discovers networked server, storage and switch resources in detail, down to the underlying disk characteristics of storage. This detail allows the Pathline software to abstract the devices to select an optimal VPD (Virtual Private DataPath) for SAN resources back to the application using the storage, once the parameters of policy (standard or special) and storage capacity (GB) are entered. All customization is done by policy management, not by scripting, which simplifies system changes. Pathline keeps system and management information in a persistent knowledge store (an Oracle database). Pathline monitors security at each node on the data path, and can respond to unauthorized changes (mandated by policy) by logging the event, notifying the administrator, and then deleting the changes and automatically rolling back to the previous state. It manages service levels based on application and infrastructure uptime. InterSAN estimates that Pathline can save an enterprise up to \$7000/TB/hour in provisioning costs by fully automating the provisioning steps, including zoning and LUN

mapping.⁴ Pathline can determine whether storage is locally or remotely mirrored and plans to manage that by policy in a later release. In future releases, Pathline will enable performance management and resource optimization based on cost.

Pathline can scale globally with a master engine that aggregates (over IP) statistics from local Pathline servers. It supports Windows NT/2000, Solaris, and Linux clients, with plans for AIX and HP-UX support in the future.

License charges for the Pathline product are based on the raw disk capacity of the SAN, the number of switch ports and the diversity of the hardware. Maintenance, including product upgrades, is 18% of the licensing fees for the standard level and 22% for premium level. Training time is two days for SAN-skilled people with Solaris experience.

Partnering is Important

InterSAN has partnerships with SAN equipment vendors (Brocade, EMC, Emulex, Hitachi Data Systems, INRANGE, JNI, LSI Logic and Qlogic) and participates in industry associations (SNIA, Fibre Alliance and DMTF). These partnerships are essential to developing the capability to interface with products from the various vendors of SAN infrastructure.

Conclusion

Many enterprises are spending significant sums on SAN infrastructure in hopes of improving storage performance and reducing total cost of ownership. It makes sense to get the most possible out of this major investment, which is why InterSAN has a compelling story. Its Pathline software allows customers to effectively make the value of a SAN greater than the sum of its parts. **By tying the SAN together and automatically aligning it to support business processes, Pathline enables the SAN to deliver on its full promise – simple, robust delivery of information at the lowest possible cost.**



⁴ This claim seems reasonable, but each enterprise will need to do its own ROI calculation.

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➤ *The Clipper Group can be reached at (781) 235-0085 and found on the web at www.clipper.com.*

About the Authors

Anne MacFarland is Director of Enterprise Systems Research with The Clipper Group. Ms. MacFarland specializes in strategic solutions being offered by enterprise systems and storage vendors, in trends in enterprise systems and networks, and in explaining these trends and the underlying technologies in simple business terms. She joined The Clipper Group after a long career in library systems, business archives, consulting, research, and freelance writing. Ms. MacFarland earned a Bachelor of Arts degree from Cornell University, where she was a College Scholar, and a Masters of Library Science from Southern Connecticut State University.

➤ *Reach Anne MacFarland via e-mail at AnneM@clipper.com or at (781) 235-0085 Ext. 28.*

Joseph S. De Natale is Director of Enterprise Systems Planning with The Clipper Group. He brings more than forty years of experience in the data processing field with particular emphasis on systems management and application development on large-scale mainframes. Prior to joining The Clipper Group shortly after its founding, Mr. De Natale was an independent consultant, first with Ropes and Gray, Attorneys at Law, where he provided expert opinion on data center management for civil cases. He later joined International Data Corporation (IDC), as a senior consultant and analyst, where he covered banking systems, data center management software, and large systems computers and storage. Formerly, Mr. De Natale spent eleven years at Citicorp Information Resources (CIR) as CIO of the Boston Data Center, where he managed the support of over 200 outsourcing contracts for thrift institutions. Earlier, he was MIS Director for the Lahey Clinic, and prior to that was a Project Manager for Computer Sciences Corporation, where he was involved with NASA and FAA outsourcing and applications contracts. Previously he was Director of AVCO Computer Services for fourteen years. At AVCO, in addition to being responsible for all internal data processing, he initiated the marketing and sales of computer services to commercial clients. Mr. De Natale began his career with Pratt and Whitney Aircraft as a programmer of nuclear physics and business applications. During his career, Mr. De Natale was involved in the evaluation, installation and operation of large-scale mainframe systems and for the development of commercial, scientific and engineering application systems. He has also had successful experience in the marketing and operation of outsourcing contracts. Mr. De Natale earned a Bachelor's and Master's degree in Mathematics from Boston College. During his period at AVCO, he was selected by AVCO to attend the Northeastern University Management Development program, a co-op program covering an MBA curriculum.

➤ *Reach Joe De Natale via e-mail at denatale@clipper.com or at (781) 235-0085 Ext. 24.*

Michael Fisch is a Contributing Analyst with the Clipper Group. He brings over six years of experience in marketing and engineering at computer hardware and software manufacturers. Mr. Fisch worked at EMC Corporation as a marketing program manager focused on service providers and as a market analyst. Prior to that, he worked in international channel development, manufacturing, and technical support at Extended Systems, Inc. Mr. Fisch earned an MBA from Babson College and a Bachelor's degree in electrical engineering from the University of Idaho.

➤ *Reach Michael Fisch via e-mail at MFisch@clipper.com or at (781) 235-0085 Ext. 36.*

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