Extending the Lifecycle and Lowering the TCO of SANs in a K-12 Environment

If you are in charge of IT for an educational institution you're probably about to bite the bullet to add a new Storage Area Network (SAN). Why? The simple answer is that it's a combination of challenges and opportunities.

It's not just the challenge of data volumes exploding at a time when K-12 IT budgets are growing ever tighter. IDC estimates that data storage requirements are growing by an average of 60% a year, and organizations already spend approximately 23% of their IT budgets on storage[1].

More to the point is the fact that the best lever to satisfy increasing demands for 1:1 computing on constrained budgets – desktop virtualization technologies such as VMware View and Citrix XenDesktop – demands the deployment of Storage Area Networks (SANs).

The investment is strategic for a number of other reasons. A SAN's central storage pool offers better capacity utilization, easier management, and simpler backup, and not just for virtualized desktops. Standalone educational applications that benefit from a SAN include audio and video streaming, disk-to-disk data backup, video surveillance, and running consolidated educational ERP systems. Indeed, any organization that runs more than one server application, from email to SQL to streaming video, should consider a SAN.

Plan for the Future

So what should you be looking for in planning for this strategic investment? More than just storage capacity, for starters. Do you need high availability? Probably. And that means storage capacity in and of itself is not such a big concern, since almost all SAN storage arrays that offer high availability also support daisy chaining multiple cabinets full of drives. The kind of drive support your vendor offers, on the other hand, will have a huge impact on your total costs, as will your ability to avoid vendors who have a business model based on products becoming obsolete in three years. Given the appropriate business model from your vendor, a longer lifecycle becomes possible and that contributes significantly to lower TCO. But that means you also need to think hard about what your performance and bandwidth needs will be five or more years from now. Finally, you need to make a binary choice at the outset.

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Leverage what you know. Several years ago, Microsoft tested whether IT professionals from mid-size organizations could install a Fibre Channel SAN in six hours or less, only to discover that the task was so complex that none of the IT generalists involved could install an FC SAN at all.

In contrast, iSCSI SANs leverage the maturity of your Ethernet familiarity and platform. Moreover, they don't have the steep price point and need for expensive storage experts of Fibre Channel. The best of the bunch have Enterprise-class networked storage performance, reliability and data availability yet no longer require proprietary knowledge or expensive storage experts. An IT generalist can handle the job, and even experts will be impressed by the flexibility they bring to what was an inflexible and labor intensive area of IT infrastructure.

Performance Matters: I/O and Bandwidth

Moving to a high-performance platform is critical in extending your SAN's lifecycle, particularly to support a large number of virtualized desktops. Look for storage arrays that provide more I/Os per second of processing power and are capable of driving the host network ports at their full line speed. Such high-performance is critical for successful virtualized desktop implementations. As you move to higher speed network cores and more virtualized desktops or additional applications using the SAN, you are also going to need a huge data pipe out the back end. Whether it's a number of 1-Gigabit Ethernet host Ethernet ports or a single 10-Gigabit port depends on the particulars of your installation and a knowledgeable vendor can help you make that determination, but it's clear that a big data pipe is likely a requirement to avoid an early and expensive fork-lift upgrade of your SAN array.

How Many Controllers?

A high availability SAN is completely resilient because of the data protection provided by RAID, the redundancy of power supplies and backup cache batteries, and, most important, dual controllers. If your intended usage is secondary (such as for archiving, departmental storage, backup, or video surveillance) and not mission critical, such redundancy may not be called for.

However, a SAN with a dual-controller design not only achieves high availability by providing redundant paths between the servers and the data they need to access, it can double the storage processing power of the array as your needs grow. You can begin with one controller active and the other standing by in case of failure. Later, make both controllers active to share the load and still enjoy the resiliency of failover.

Disk drive considerations. Some SAN array vendors support only their own brand of drives at steep prices. They force customers to add capacity in sets of these exactly matched proprietary drives and trap unused space in inflexible array groups dedicated to one type of application. Planning becomes paramount lest you dedicate these inflexible, multi-drive storage pools for one application profile and end up needing another.

One way to get around this problem is to look for systems that handle volumes in a way that allows each drive to participate flexibly in array groups. One impact of such an approach is that such systems can utilize unused capacity available in any drive. It also becomes possible to spread the volume at any point in time across as many drives as needed, tapping the I/O from each additional spindle until you've satisfied changing performance requirements.

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The other thing such technology enables if the vendor's business model doesn't prevent it is the ability to purchase standard disk drives at street price and add additional drives only as you need them. That means you're always tapping the latest generation of either high-capacity SATA or higher performance SAS drives to maximize price/performance.

Simple, flexible reconfiguration. While you're looking for flexibility in drive support, also look for flexibility and ease in reconfiguring which drives are in what volumes to keep the array aligned with changing storage requirements. This is an absolute necessity if you are to keep the system long enough to significantly impact your total cost of ownership over the product's lifecycle. Reconfigurations to change out drives for a new generation drive technology, move an application type to higher performance media, or whatever the need might be should be possible on the fly without having to take your mission critical storage system offline.

Economic Model of the Vendor

Even if you correctly size a platform that can provide sufficient capacity, I/O and bandwidth performance to get you beyond the typical 3-year refresh cycle, you may find yourself caught in a trap. Vendors often up support charges on their older platform after the initial 3-year support contract expires to drive you to an early upgrade.

That trap does not exist if the vendor requires no support contract. You'd need to know that free firmware updates are available on the web. You'd also be wise to look for the vendor to offer extended warranties, just to be sure that support, parts and so on are available even if the platform is replaced by newer technology and hits its end of life.

Choose the Right Supplier

D-Link's SAN solutions offer a networked storage platform at a significant cost savings while delivering the flexibility to grow, maintain and re-purpose physical resources over time.

D-Link's state-of-the art controller outperforms all competitors in its price range with 80K I/Os per second for high-performance transaction needs and full 10GbE line speed and either 4xGbE, 8xGbE data ports or 1x10GbE data port per controller. Thus the latest generation high availability D-Link DSN-5000 series arrays can handle more performance and capacity growth than competitive systems, setting you up for a longer product lifecycle and lower total cost of ownership.

With D-Link SAN arrays, satisfying the storage needs of an application is as simple as selecting an application from a menu and choosing a volume size. A wizard optimizes the quality of service appropriate for an application by setting RAID type, striping and block size, and manages on-the-fly reconfigurations that are impossible on other systems in this price range.

D-Link requires no support contract. Firmware updates are available on the web for no charge. Moreover, D-Link offers extended warranties for as long as five years beyond the end of life of its storage platform.

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With the addition of D-Link's DSN-5000 family, customers can now turn to D-Link for their primary storage requirements as well as the secondary storage needs satisfied by D-Link's DSN-1100/2100/3000 SAN arrays.

All D-Link storage arrays can be discovered and managed with the same intuitive user interface. The compatibility across the line simplifies managing tiered primary and secondary storage and allows off-site replication to a less-expensive array to maintain business continuity at lower costs.

The DSN-5000 line supports daisy chaining additional cabinets to handle capacity up to a maximum today of 84 2-TB drives (higher capacity drives supported as they come to market). Nor does I/O performance bottleneck as you add cabinets. The opposite is true. Adding more drives spindles increases total I/O performance.

D-Link's storage experts can help you project your future bandwidth, I/O and capacity needs. The company's experience with desktop virtualization environments and other common educational applications you anticipate for your future will help ensure proper sizing and configuration of your SAN.

Call or visit the web address below for more information on the complete line of business products:

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