



# Boys Town improves performance 10-fold while avoiding \$600,000 in storage costs with Dell and Intel

- Backup/Recovery/Archiving
- Blade Solutions
- Consolidation
- Database—Oracle
- Database—SQL Server
- Linux
- Services
- Storage/Storage Consolidation
- Virtualization—Client
- Virtualization—Server



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*Jeff Stanley,  
Network Systems Engineer III,  
Boys Town*



## Customer Profile

Company:	Boys Town
Industry:	Education
Country:	United States
Employees:	3,000
Web:	<a href="http://www.boystown.org">www.boystown.org</a>

## Institutional Need

Faced with aging servers and storage and a backup window that was growing out of control, Boys Town needed to refresh its IT infrastructure while meeting performance requirements and keeping costs down.

## Solution

Boys Town moved away from a traditional frame-based SAN and paired Dell™ EqualLogic™ virtualized storage arrays with Intel®-based Dell PowerEdge™ servers running VMware vSphere to virtualize more than 70 percent of its servers. The organization also deployed Dell PowerVault™ direct-attached storage arrays and CommVault data protection software to achieve faster recovery times with disk-to-disk-to-tape backups.

## Benefits

- 10-fold improvement in performance for production systems
- Database scripts return results in seconds vs. minutes
- \$600,000 savings by using Ethernet-based storage
- 55% decrease in cost per GB for first-tier and second-tier storage
- Replication, thin provisioning and snapshotting included with SAN
- \$250,000 annual cost avoidance in storage purchases through thin provisioning
- 10 minutes to provision storage for any application or operating system
- Able to grow centralized storage without adding IT staff
- 70% of servers virtualized

Boys Town has been a national leader in the care and treatment of children since its founding more than 90 years ago by Father Edward Flanagan. As one of the largest nonprofit, nonsectarian child and family care organizations in the country, Boys Town provides compassionate, research-proven treatment for children with behavioral and emotional problems.

"A lot of companies say they want to have partners instead of just customers, but Dell really means it. They make it happen."

*Jamie Pearson,  
Network and Operations Manager,  
Boys Town*

Each year, Boys Town programs and services touch the lives of 1.6 million people in the United States. Boys Town's unique Integrated Continuum of Care provides a spectrum of services based on the consistent delivery of the Boys Town Model<sup>SM</sup>.

The Village of Boys Town in Nebraska remains the national headquarters for Boys Town and is the research, program development and administrative center of the organization.

#### **Wanted: a platform for flexible growth**

From an IT perspective, Boys Town supports both a municipality and an educational institution, with the added challenges of a distributed organization. Relying heavily on donations, Boys Town must spend its limited technology dollars wisely in order to maximize the organization's budget for patient care. After squeezing the most life it could out of an aging IT infrastructure, Boys Town was ready for a complete refresh of its systems. The most immediate concerns were the organization's storage situation and its reliance on a purely physical server infrastructure.

"We had a traditional, frame-based Fibre Channel SAN along with a lot of in-server and direct-attached storage, and we were running into a situation where our backup window was becoming too long," explains Jeff Stanley, network systems engineer III. "Our legacy SAN solution had really put us in a corner as far as flexibility, growth or change. It was difficult to administer and didn't give us much in the way of business continuity."

Boys Town depends heavily on SunGard Higher Education Banner Finance, Position Control and Human Resources modules. In order to achieve optimal performance for Banner, the SAN had to be dedicated largely to, and configured around, Banner's Oracle 10g database traffic.

"It really tied our hands, because we couldn't reconfigure the SAN for different storage tiers," says Stanley. "We ended up buying another Fibre Channel SAN for other data because of the difficulty in reallocating performance and space. But we were still using very expensive disk for things that should have been on more cost-effective storage, such as file shares. We wanted a

tiered storage solution that would provide us both the performance and the capacity that we needed to virtualize our servers, as well as a completely new backup solution to go along with that."

### Technology at Work

#### Services

[Dell™ IT Consulting Services](#)

[Dell Support Services](#)

#### Hardware

[Dell EqualLogic™ PS6000XV, PS5000XV, PS5000E and PS4000E iSCSI SANs](#)

[Dell PowerEdge™ M1000e modular blade enclosure](#)

[Dell PowerEdge M610 blade servers with Intel® Xeon® 5600 series processors](#)

[Dell PowerEdge rack-mount servers](#)

[Dell PowerVault™ MD1000 direct-attached storage arrays](#)

[Dell PowerVault TL2000 tape library](#)

#### Software

[CommVault Simpana 8](#)

[Dell EqualLogic Multipathing Extension Module for VMware](#)

[Dell EqualLogic SAN HeadQuarters \(SAN HQ\)](#)

[Microsoft® Exchange Server 2007](#)

[Microsoft SQL Server® 2008 database](#)

[Oracle 10g database](#)

[Red Hat® Enterprise Linux](#)

[SunGard Higher Education Banner 8.3](#)

[VMware® View](#)

[VMware vSphere™ 4.1](#)

[Windows® 7](#)

[Windows Server® 2008 R2, 2008](#)

## All storage is not equal

After evaluating virtualization solutions from various vendors, Boys Town decided on [VMware vSphere](#). Putting the right centralized storage solution in place was the next step—and with all that was at stake, Boys Town couldn't afford to make the wrong decision. At first, Stanley and his team assumed that in order to get the performance the organization needed for critical applications, it would have to invest in yet another Fibre Channel array. However, Boys Town's Dell account representative suggested the team look into a virtualized, scale-out iSCSI SAN as a possible alternative to a frame-based storage architecture.

"Our Dell account representative had made himself very available to us on previous projects, and he already had a deep understanding of our environment," says Stanley. "So based on his suggestion, we began looking at vendors that offered Ethernet-based storage solutions."

After evaluating iSCSI-capable storage offerings from Dell, EMC, LeftHand (now HP) and NetApp, Boys Town decided that [Dell EqualLogic](#) storage arrays would be the best fit. "Dell arranged for us to talk to some of the high-level EqualLogic engineers, who helped us understand how the product worked and how it would perform in our environment," says Ryan Metcalf, network systems engineer II. "We also wanted tools such as snapshotting, replication and thin provisioning, which a lot of SAN vendors told us they had, but they left out how much extra it was going to cost. We were, of course, on a limited budget, and we liked the fact that EqualLogic gave us all the features we needed to move forward."

Ultimately, EqualLogic won because of its ease of use, performance, all-inclusive feature set, inherent scalability and flexible storage tiering. "Our Fibre Channel storage vendor tried to scare us away from iSCSI and actually approached our Oracle DBAs and told them that our proposed solution was not going to provide the performance that they needed," says Stanley. "The EqualLogic engineers were able to put our minds at ease and refute those claims."

## Tiers of joy

Boys Town virtualized more than 70 percent of its servers, including its application tier for Banner, using [Dell PowerEdge](#) servers as VMware hosts. Its production Oracle databases run on non-virtualized Dell PowerEdge servers. Dell EqualLogic storage, including PS6000XV and PS5000XV arrays with high-performance SAS disk and PS5000E arrays with cost-effective SATA disk, now supports Boys Town's entire infrastructure. A Dell EqualLogic PS4000E array with SATA

disk will soon serve as a replication target at an off-site disaster recovery facility.

The faster SAS disk—which Boys Town calls the "fast pool"—supports Oracle and [Microsoft SQL Server 2008](#) database workloads, as well as [Microsoft Exchange](#) and virtual servers requiring high I/O. The "bulk pool" of SATA disk stores primarily CIFS shares, which are presented by a virtual [Windows Server 2008](#) server. Boys Town uses [EqualLogic SAN HeadQuarters](#) (SAN HQ) software to monitor performance and I/O.

"We now have the flexibility and the scalability to adapt our storage to our needs as our needs change," explains Jamie Pearson, network and operations manager. "We can buy different types of disk for different projects, instead of being locked in to expensive Fibre Channel disk for everything." Metcalf estimates that this flexibility has allowed Boys Town to decrease its cost per gigabyte for first-tier and second-tier storage by approximately 55 percent compared with a single-tray storage architecture.

## Saving \$250,000 a year with thin provisioning

Boys Town is also using the built-in thin provisioning capabilities of Dell EqualLogic storage to defer storage purchases until they are absolutely necessary. "Developers always ask for more storage than they are going to use right away," says Stanley. "Right now we're sitting at 120 percent allocated storage, but we're only using around 80 percent of our total capacity."

"That's huge for us," notes Pearson. "We're able to use all of our storage to its fullest extent before investing in more disk, and defer around \$250,000 a year in storage purchases."

"The biggest plus with thin provisioning is we're able to show management that we are using the purchased space and also predict budget numbers for future growth," adds Metcalf.

## 10-fold improvement in performance

The EqualLogic arrays perform automatic, intelligent load balancing to provide optimal performance with no manual intervention required. With the legacy frame-based SAN, performance was beginning to degrade as Boys Town added more capacity to the same controllers. In contrast, with EqualLogic, scaling performance and capacity is as easy as adding another array to the storage pool, which takes about 15 minutes. Each unit includes fully redundant components and adds I/O, throughput and processing resources as well as capacity.

"When we recently added the PS6000XV, it wasn't so much that we needed more

"With these systems, we can comfortably run 50 users on each Dell blade and not worry about processor performance."

*Ryan Metcalf,  
Network Systems Engineer II,  
Boys Town*

capacity right away, but that we wanted the additional I/O and processing power that stacking the EqualLogic arrays gives us," notes Stanley. "It's really nice to just be able to throw another array in the pool and get a substantial increase in our available I/O, so that we're not dropping off on performance of Oracle or other applications where we've already committed to a certain level of performance."

Even over a 1GbE network, performance for production applications has improved 10-fold compared with the legacy Fibre Channel arrays, says Stanley. "That's due in large part to us installing the EqualLogic Multipathing Extension Module for VMware," he says. "By providing multipath I/O to the EqualLogic SANs, we've enabled dynamic routing of iSCSI connections, which greatly improved performance for high I/O workloads such as Oracle on Linux and our new [virtual desktop](#) infrastructure."

The Oracle DBAs whom Boys Town's former storage vendor tried to frighten aren't scared in the least. "At first, they thought something was wrong, but then they checked the logs and realized that their scripts were running so fast, they didn't notice they had run," says Stanley. "They were returning results in seconds where they used to take minutes."

In addition to better performance, Boys Town can also provision storage much faster. "We can provision storage for any application or operating system, regardless of whether it's a physical or virtual server, within 10 minutes," says Stanley. "In the Fibre Channel world, that could take half a day. By using EqualLogic, we have been able to grow our centralized storage as needed without having to add additional IT staff."

### A scalable solution for virtual desktops

Boys Town's virtual desktop deployment consists of VMware View software purchased through Dell running on Intel technology-based [Dell PowerEdge M610 blade servers in a Dell PowerEdge M1000e modular blade enclosure](#). [Dell IT Consulting Services](#)

assisted with the initial pilot and provided knowledge transfer.

"Being a nonprofit, when things get tight, refreshing desktop hardware is one of the last things on our list," says Stanley. "We literally use our desktops to the point of death—we have eight-year-old hardware sitting out there being used every day. When some of the newer features started coming out with [Windows 7](#) and Microsoft Office 2010, management wanted those things, but unfortunately we didn't have the capacity to do it using a traditional model. Virtual desktops became a very economical option to get the most out of aging hardware, as well as giving us the added benefit of ease of administration and, hopefully, a long-term reduction in administration time."

Currently, Boys Town has 200 virtual desktop users. With the ability to accommodate up to 16 half-height blade servers in a single enclosure, Boys Town will be able to scale its virtual desktop deployment to up to 900 users without taking up any more rack space. "We're just scaling up," says Metcalf. "With these systems, we can comfortably run 50 users on each Dell blade and not worry about processor performance."

Blades were the right server architecture for the virtual desktop deployment because of the small footprint and simplicity of deploying a new blade. "It's similar to what we get with EqualLogic—the Dell blade enclosure allows us to scale, build and grow," says Metcalf. "Whenever we reach a limit on processing power or memory, all I have to do is slide in a new blade."

Dell EqualLogic storage is also a natural fit for virtual desktops. "We chose to add VMware View desktops to our existing EqualLogic SAN, because we knew we would be able to monitor our performance and capacity headroom using SAN HQ," says Metcalf. "This allows us to accurately predict when we will need to expand I/O or capacity with another EqualLogic array as we add new virtual desktop users."

### Eliminating the backup window

Boys Town is also protecting its data much more reliably through a combination of EqualLogic snapshots and CommVault Simpana data protection software, which backs up data to [Dell PowerVault MD1000 direct-attached storage arrays](#). After 15 days, data is transferred to tape for offsite storage using a [Dell PowerVault TL2000 tape library](#).

"Before, some of our backups were running as long as 36 hours, and they were running over the Fibre Channel network," says Stanley. "Even though we were doing disk-to-disk backups in our backup window, we were trying to move them to tape during production hours, and that was impacting performance. It got to the point that we no longer were able to move from disk to tape during the day, and that further decreased our backup window availability at a time when our data was continuing to grow at a very alarming rate."

With the CommVault software and EqualLogic snapshots, Boys Town has eliminated the backup window. "We can back up anything during production hours now, and it has a nominal impact on performance," says Stanley. "And the ability to utilize point-in-time EqualLogic snapshots to quickly restore files, complete data sets or virtual machines has really been a boon for us—our developers love us now."

### Saving \$600,000 on storage

By using scale-out Dell EqualLogic storage instead of continuing down the upgrade path with its previous storage vendor, Boys Town trimmed \$600,000 off the cost of the infrastructure refresh. "We would have at least doubled our storage costs if we had not switched to Dell EqualLogic, and we would not have achieved the same level of flexibility and performance," says Stanley.

"We have a fantastic relationship with Dell, and we have for a long time," Pearson concludes. "A lot of companies say they want to have partners instead of just customers, but Dell really means it. They make it happen."



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