BACKUP/RECOVERY/ARCHIVING
CLUSTERING
CONSOLIDATION
DATABASE
MANAGEMENT/UTILITIES
MESSAGING
VIRTUALIZATION

Metrologic

Data Collectors

New storage solution from Dell improves Metrologic Instruments' backup time by more than 80%

CUSTOMER OVERVIEW

Metrologic Instruments is a leading provider of hardware and software for data capture and collection. *www.metrologic.com*

CHALLENGE

Expand storage capacity to accommodate business growth and enhance worker productivity; improve backup process efficiency to ensure business continuity and protect 40 years' worth of intellectual property

SOLUTION

Dell™ Infrastructure Consulting Services (ICS) designed and deployed a new storage infrastructure using Dell/EMC storage area network (SAN) arrays and Dell PowerVault™ tape libraries; Dell ICS deployed Dell PowerEdge™ servers running VMware® virtualization software to help consolidate the server environment

BENEFIT

The new storage infrastructure can scale to meet Metrologic's future needs while helping improve engineer productivity; the backup infrastructure helps protect intellectual property while reducing full disk-to-tape backup time from 80 to 14 hours; the replicated virtualized environment helps ensure business continuity, resulting in server consolidation and a goal of 200 percent return on investment

For nearly 40 years, Metrologic Instruments has been designing and manufacturing both hardware and software for data capture and collection. A commitment to quality design and engineering has helped the company become a leading provider of bar code scanners. In fact, a recently conducted survey by *Vertical Systems Reseller* magazine named Metrologic the number one maker of point-of-sale bar code scanners on the market.[1] And for Metrologic that is a market that extends to 110 countries around the world.

As the business has grown, so has the company's need for storage capacity. "Most of the computer-aided design (CAD) files that our engineers work with are 150 to 200 MB each, so that data adds up fast," says Barry Schwartz, IT/network manager at Metrologic. "At the same time, a range of other departments are contributing to production of data. Our marketing department, for example, produces all its own materials, including huge data sets like video and graphics. We need a highly effective way to store all that data."

In addition to accommodating the growing volumes of data produced on a daily basis, Metrologic needs a plan for long-term storage of vital company information. "Metrologic holds over 350 patents, with 100 more pending," explains Schwartz. "Our intellectual property is what makes us who we are, so protecting that data is essential to the business."

DELL

> "Dell ICS examined not only our immediate needs but also our goals for the future in terms of data replication, disaster recovery, and data backup. The Dell team helped us plan the details of the SAN deployment, and they helped us map out our long-term storage strategy."
>
> — **Barry Schwartz,** IT/Network Manager
> Metrologic Instruments

Simply storing company data is only a part of the puzzle. Metrologic also needed to ensure that its storage infrastructure could deliver the performance its engineers require. "Engineers are expensive—their time is valuable," states Schwartz. "When their productivity is affected by slow disk access, it can become a problem. We have to make sure they can access information as quickly as possible."

The company's existing heterogeneous IT infrastructure was too difficult to manage and nearly impossible to scale. "Most of our infrastructure was made up of in-house white boxes," Schwartz says. "After our first shared storage array reached its capacity, we had been deploying direct-attached storage just to survive our expanding data storage needs. We were down to our last 100 MB of free data storage space."

In addition to its capacity issues, Metrologic was facing other storage challenges that were endangering the business on a global scale. "Our lack of storage had become a productivity bottleneck," notes Schwartz. "But it also meant that our backup window was expanding and threatening to jeopardize our existing recovery plan. We wouldn't be able to recover those volumes of data quickly enough if something happened. These issues were felt not just in our U.S. headquarters but in data centers in China and Germany as well."

Dell ICS helps Metrologic meet future storage expansions with Dell/EMC SAN

Metrologic knew that the company's current storage needs required not only quality products but also design and implementation assistance. Though the company considered other vendors, previous positive experiences with Dell convinced Schwartz to enlist its help deploying a new storage area network (SAN) array. "We had previously used a Dell/EMC CX200 SAN array, and we were very pleased with the product," according to Schwartz. "We were also impressed with the Dell team's work installing and configuring array, and then providing training. We approached Dell again to see how it could help us solve our current storage challenges."

Dell Infrastructure Consulting Services (ICS) assessed Metrologic's storage requirements and then designed a SAN that addressed those needs. "Dell ICS examined not only our immediate needs but also our goals for the future in terms of data replication, disaster recovery, and data backup," explains Schwartz. "The Dell team helped us plan the details of the SAN deployment, and they helped us map out our long-term storage strategy."

At the company's U.S. data center, Dell ICS helped Metrologic install a Dell/EMC CX3-40 SAN array along with Brocade 4100 32-port 4 Gb Fibre Channel switches. The Metrologic CX3-40 SAN currently uses approximately 5 TB of the 12 TB in the SAN's current configuration, leaving plenty of room for future expansion. Dell ICS also deployed Dell/EMC CX3-20 SAN arrays at data centers in both China and Germany. "Part of our storage plan was to have similar storage implementations at each data center to simplify management," says Schwartz. "But we also had plans to use all three storage arrays to back up and replicate data."

The multidisk design of the Dell/EMC CX3-40 and CX3-20 SAN arrays allowed Metrologic to deploy a storage strategy that delivered high-performance disk access to users. "These Dell/EMC SANs have multiple disks that spin at different speeds," he says. "To get the performance our engineers need, we use the fastest disks for our tier one storage. Files that are either less critical or accessed less frequently are stored on more spacious, slower spinning disks. That enables a very cost effective storage structure."

The Dell team installed Microsoft® Windows® Storage Server to help Metrologic manage storage throughout the network. "We are definitely a Microsoft shop, but we wanted to make sure it was the right decision to use Windows Storage Server for management," notes Schwartz. "Dell ICS helped us weigh our options and examine our long-term plans before making the decision."

Dell helped Metrologic design its storage infrastructure so that the company could take advantage of an eventual upgrade of Microsoft Exchange. "We knew we wanted to upgrade to Microsoft Exchange 2007 in the future," says Schwartz. "The big difference between Exchange 5.5 and the new version is the ability to use shared storage. Both SAN arrays are ideally suited to the demands of e-mail storage. Now our storage infrastructure can easily accommodate the Exchange upgrade."

So far, Schwartz and the people he considers his primary customers—Metrologic's engineers—are very happy with the new SAN. "We've seen incredible performance improvements accessing the large CAD files that the engineers use," states Schwartz. "So much so that when we initially tested the SAN, I had engineers beating down my door demanding their files be the first moved to the new SAN."

Global replication strategy improves file sharing and data security

The engineers in China were similarly pleased with the new SAN deployment, not only because of the improved local file storage performance, but also because of the improved file sharing between China and the United States. "Engineers in both locations could potentially need to access a single file at the same time," says Schwartz. "We needed a way to merge and replicate files so that engineers could use and work on files without worrying about file corruption. These new SAN deployments gave us the opportunity to use more advanced replication software to protect our data."

After testing a few products that turned out to be quite limited, Schwartz chose Double-Take Software for storage replication. "The first few products we tested either couldn't do real-time replication of certain CAD files or couldn't do bit-level replication," explains Schwartz. "We kept ending up with numerous copies of the same file everywhere. That is not very efficient from a storage perspective. Double-Take solved those issues. Beyond the benefits of file sharing between data centers, effective replication also played into both our backup and disaster recovery strategies."

Multidisk SAN arrays enable tiered backup strategies that help save hours of backup time

In addition to accommodating the company's growing data capacity, Metrologic needed efficient ways to back up those increasing volumes of data without significantly adding time to backup windows. "We used to back up to tape once a week, but as the data grew, so did that backup window," says Schwartz. "Backing up to tape was taking as much as 80 hours. And that was just our existing SAN. Because of the way we had spread out storage on DAS, I wasn't even confident we were backing up all of the data we should be."

The multidisk design of the SAN arrays that provided high-performance storage also enabled Metrologic to implement a tiered backup strategy. "Before we would just back up to tape," explains Schwartz. "Now, with the additional capacity, we can back up to disk more frequently than once a week."

Metrologic uses Symantec Backup Exec to back up data onto 500 GB 7200 RPM SATA drives within the same array. "We can do continuous incremental backups from the higher-performance disks in the array," says Schwartz. "Then we can also do full backups to the disks in the array on a weekly basis."

Metrologic backs up to tape once a month to preserve data off-site. For that task, Metrologic installed Dell PowerVault ML6000 CM modular tape libraries in both the United States and China. "Installation and configuration of the PowerVault ML6000 CM was very simple with these tape libraries," according to Schwartz. "We hooked them up to the SAN and Backup Exec identified the tape libraries, and we were backing up from disk to tape in no time at all."

In comparison with the previous full backup time at Metrologic, the whole backup process is much faster. "The best thing about this new Dell setup is the speed," says Schwartz. "Everything is Fibre Channel. Disk-to-disk backup is fast and confined to the arrays. We can back up disk to tape at about 1 GB per minute. So even though I have much more data—all that DAS is now consolidated on the SAN—we are down to a 26-hour full disk-to-tape backup. And since we can do that backup in parallel, with two drives, we can do it in 14 hours versus 80 hours in the old environment."

Replication and backup strategies helps ensure faster disaster recovery

Schwartz considers the storage strategies he has implemented as preparation for disaster recovery. "Being able to replicate data between data centers in New Jersey, China, and Germany means the company's intellectual property is safe," says Schwartz. "We can have multiple copies of all the work being done here. So, if we have any problems at one data center, we can failover to another without much business interruption."

Also, the multitiered backup strategy enables rapid backup from disk. "Since we back up to disk first, we can recover much faster, especially on a file-by-file basis," explains Schwartz. "Overall, we have a much more flexible disaster recovery plan. And we have been able to complement that plan with other purchases from Dell."

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> Metrologic Instruments

Dell and VMware help Metrologic in their goal to achieve nearly 200 percent return on investment

While working with Dell on Metrologic's storage implementation, Schwartz took the opportunity to fix some of his company's other IT infrastructure challenges, namely server consolidation and standardization. "We wanted to replace a lot of our white boxes," says Schwartz. "We knew we couldn't afford to replace them all, but we suspected that we didn't have to. Many of our servers were underutilized. So we had an opportunity to both replace servers and consolidate application instances."

With recommendations from Dell, Metrologic selected Dell PowerEdge 2950 servers with dual-core Intel® Xeon® processors. The Dell ICS team helped Metrologic deploy VMware ESX Server virtualization software on those servers to help maximize the utilization and flexibility of the server infrastructure. "We are now creating 10 virtual machines per server, and we still have plenty of room for growth," says Schwartz. "This has allowed us to consolidate our server environment by 80 percent in all our data-centers globally. In addition, the shared storage pool really complements the virtualized servers. We can use VMware's VirtualCenter and VMotion management tools in conjunction with our Dell/EMC SAN to administer the virtualized setting and seamlessly move around virtual machines on the fly for load balancing and failover."

Schwartz experienced the automatic failover features of VMware VMotion™ not long after deployment. "We had an incident where one of the servers running VMware had a little hiccup," recalls Schwartz. "It wasn't a major problem, but VirtualCenter and VMotion automatically migrated 8 virtual machines over to another server within 30 seconds. One of the migrated applications was a print server. I was printing something at the time, and my job came through as if nothing had happened."

Schwartz anticipates that using VMware on Dell PowerEdge servers will save the company money. "Taking into account the cost of the hardware, as well as the savings on hardware and software licenses from not having to buy additional hardware, I estimate that Metrologic would achieve a 200 percent return on investment," says Schwartz. "And that doesn't even take into account the energy savings of running fewer servers."

Furthermore, Schwartz believes running VMware will help enhance the company's disaster recovery plan. "We hope to replicate application instances on virtual machines using Double-Take and VMotion," states Schwartz. "That way, potential failures—even a hardware failure in China—wouldn't affect business processes at all. We can simply failover to the replicated virtual machine in the United States."

High-performance storage complements high-performance workstations

To complement the company's new high-performance storage and server environments, Metrologic uses Dell Precision™ M90 mobile workstations to run high-end CAD software products like PTC Pro/Engineer and SolidWorks 3D Mechanical Design. "We are always impressed that the Precision mobile computers can run such a wide range of processor-hogging applications," says Schwartz. "Our engineers often need to travel, to collaborate face-to-face with our engineers in China. Being able to take such a powerful tool along for the ride really helps simplify the whole design process."

New storage delivers greater capacity, scalability, and availability

Though Metrologic has a largely self-sufficient IT organization, Schwartz's group definitely benefited from the knowledge and thoroughness Dell ICS contributed to the recent deployments. "Dell ICS brought so much to the table," says Schwartz. "We don't have a very big IT department, and having Dell ICS come in and design and install our storage environment according to our custom requirements, and then also train us on the new environment, meant that the SAN would be configured right from the start, that it would accommodate our plans for the future, and that we could manage it ourselves going forward."

The SAN itself has been a boon to the productivity of Metrologic's engineers. "With the improved read/write access of the SAN, our employees get much faster access to files," notes Schwartz. "That improves productivity across the board."

"Installation and configuration of the PowerVault ML6000 CM was very simple with these tape libraries. We hooked them up to the SAN and Backup Exec identified the tape libraries, and we were backing up from disk to tape in no time at all."

— **Barry Schwartz,** IT/Network Manager
Metrologic Instruments

Since handling data storage entails preserving the intellectual property that Metrologic has developed over nearly 40 years, the redundancy, backup, and disaster recovery capabilities of the new storage implementation have imparted a much-needed feeling of security. "This might seem simplistic, but we know where our data is," concludes Schwartz. "Whether the data originates in China, Germany, or here in the United States, we know where to find it, we know it is safe, and we can get to it quickly. For a company that has been built on unique ideas, sometimes preserving that knowledge becomes even more important than simply selling products."

HOW IT WORKS

HARDWARE:

- Dell™ PowerEdge™ 2950 servers with dual-core Intel® Xeon® processors
- Dell/EMC CX3-40 and Dell/EMC CX3-20 storage area network arrays
- Dell PowerVault™ ML6000 CM modular tape library
- Dell PowerVault Tape Backup 124T dual magazine tape loader
- Dell Precision™ M90 mobile workstations
- Brocade 4100 32-port 4 Gb Fibre Channel switch

SOFTWARE:

- Double-Take Software
- Microsoft® Exchange
- Microsoft Windows Server® 2003
- Microsoft Windows® Storage Server
- PTC Pro/Engineer
- SolidWorks 3D Mechanical Design
- Symantec Backup Exec
- VMware® ESX Server
- VMware VirtualCenter
- VMware VMotion™

SERVICES:

- Dell Infrastructure Consulting Services
- Dell Gold Technical Support Services
- Dell CompleteCare™ Accidental Damage[2]

[1] www.verticalsystemsreseller.com/vsr/pages/archives/articles/VSR-2006-Leaderboard.pdf

[2] CompleteCare service excludes theft, loss, and damage due to fire, flood or other acts of nature, or intentional damage. CompleteCare not available in all states. Customer may be required to return unit to Dell. For complete details, visit www.dell.com/servicecontracts.

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