

FLYING HIGH

Cornell Lab of Ornithology pairs Dell servers with Intel processor technology, and Dell EqualLogic storage to save six figures



SOLUTIONS

- BACKUP/RECOVERY/ARCHIVING
- CONSOLIDATION
- POWER & COOLING
- VIRTUALIZATION

The **Cornell Lab** of Ornithology 

CUSTOMER PROFILE

COUNTRY: United States

INDUSTRY: Nonprofit Organization

FOUNDED: 1915

NUMBER OF EMPLOYEES: 250-300

WEB ADDRESS:

www.birds.cornell.edu

CHALLENGE

Cornell Lab of Ornithology needed a consistent backup and disaster recovery solution to protect terabytes of critical data amassed by researchers to further conservation and explore the biodiversity of the planet. Server sprawl also threatened the efficiency of IT operations.

SOLUTION

The Lab consolidated multiple backup systems on Dell™ EqualLogic™ iSCSI SANs for data protection and disaster recovery solutions that provide full recoverability of data. It also virtualized servers with VMware and Dell PowerEdge™ servers with Intel Xeon processors to eliminate server sprawl and improve manageability and efficiency.

BENEFITS

RUN IT BETTER

- 6-hour recovery time objective with Dell EqualLogic storage
- Able to expand storage in 1 hour with no downtime
- Manageability of storage provides extra time for critical administrative duties

GROW IT SMARTER

- Consolidated servers by 93% through virtualization
 - 66% savings in floor space
 - 83% less power required for servers
 - 6-figure savings compared with subscription-based backup



DELL

From the dance of the sharp-tailed grouse—a mating behavior put on by the male grouse to attract the attention of the female—to the song of the right whale, a species on the verge of extinction, the Cornell Lab of Ornithology collects, analyzes and disseminates data on the vertebrates that populate our world. A nonprofit research and outreach organization associated with Cornell University and located near the main campus in Ithaca, New York, the Lab's mission is to interpret and conserve the earth's biological diversity through research, education and citizen science focused on birds. The Lab also does research on fish, mammals, reptiles and amphibians. The Cornell University Museum of Vertebrates contains more than 1.5 million vertebrate specimens. The Bioacoustics Research Program develops new techniques for taking censuses of wildlife populations and tracking them, including birds, whales and elephants.

“I DON'T HAVE TO LOG ON TO THE DELL EQUALLOGIC SAN MORE THAN TWICE A WEEK. I WOULDN'T HAVE TIME TO MANAGE OPERATIONS IF IT WEREN'T FOR DELL EQUALLOGIC AND VIRTUALIZATION.”

Adam Mikolajczyk, IT manager, Cornell Lab of Ornithology

WINGING IT

Itself the image of diversity, the Cornell Lab of Ornithology brings together under one roof different groups that had been housed throughout the campus until the construction of a spacious, state-of-the-art facility in the middle of a nature sanctuary a few years ago. Shortly afterward, the Lab hired Adam Mikolajczyk, IT manager, to create a well-managed, world-class IT department out of the mélange of policies, hardware and procedures that had evolved through the mergers.

“We had server sprawl, upwards of a dozen servers, all makes and models,” says Mikolajczyk. “Some of them were under warranty. Some weren't. We had each server doing a tiny bit of everything. If we had to reboot a server, there was no telling who would be impacted. But the most critical problem was the lack of a coherent backup system and disaster recovery solution. We had a subscription backup service that we projected would cost well into six figures annually within five

years. We had direct-attached storage on some servers which was a nightmare to manage. Some people didn't have a backup system at all. Other people would burn DVDs once in a while. The legacy SAN was a thorn in my side because it was a beast to manage. The desktop support folks didn't want to touch it because they were afraid if they clicked the wrong thing, we'd lose terabytes of data.”

CONSOLIDATING TERABYTES OF STORAGE

The Bioacoustics Research Program, the largest user of data at the Lab, provided the catalyst for change when it received 20 terabytes of new raw data. To provide adequate protection and disaster recovery, the Lab prepared to purchase more capacity for the SAN, turn on snapshotting and replication features and bring a secondary legacy SAN up to the level of the primary system to replicate data to a disaster recovery site—all for \$160,000. A few days before the PO was cut, a Dell representative paid a visit.

HOW IT WORKS

HARDWARE

- Dell™ PowerEdge™ R610 servers with Intel® Xeon®, E5520 processors
- Dell OptiPlex™ 960 and 760 desktops with Intel Core™ 2 processors
- Dell Latitude™ E6400 laptops with Intel Core 2 processors
- Dell Precision™ T7400 workstations with Intel Xeon X5482 processors
- Dell EqualLogic™ PS5000E and PS5500E iSCSI SANs
- Dell PowerConnect™ 5424 Gigabit Ethernet switches

SOFTWARE

- FileMaker database software
- Microsoft IIS
- Microsoft SQL Server® 2005 database
- Microsoft® Windows Server®
- Peachtree Accounting
- Specify custom cataloging system
- Ubuntu Linux
- VMware® ESX Server 3.5

SERVICES

- Dell ProSupport

“VMWARE AND EQUALLOGIC ARE MADE FOR EACH OTHER. THEY MAKE THE PERFECT CONSOLIDATION SOLUTION.”

Adam Mikolajczyk, IT manager, Cornell Lab of Ornithology

The university has a longstanding relationship with Dell. About 95 percent of Cornell's desktops are Dell, and several times a year a group of Cornell staff gets together to select a bundle of Dell models to be marketed through Cornell's Dell Premier Page. Cornell currently uses Dell OptiPlex 960 and 760 desktops with Intel Core 2 processors, as well as Dell Latitude E6400 laptops with Intel Core 2 processors. Researchers at the Cornell Lab of Ornithology use Dell Precision T7400 workstations. “As a former Cornell desktop administrator, I always prefer to purchase from Dell because my experience with Dell equipment and service has been so excellent,” says Mikolajczyk.

SIMPLIFIED MANAGEMENT, SEAMLESS EXPANSION

Dell offered to replace the existing SANs with Dell EqualLogic iSCSI SANs for what it was going to cost the Lab to expand its installation. The Lab would get all-new scalable, high-performance storage along with snapshotting, replication and other powerful software features that are turned on out of the box with no à la carte licensing fees.

“I didn't believe it was possible,” says Mikolajczyk. “But we scheduled a technical demonstration, and Dell came in with two Dell EqualLogic PS5000E iSCSI SAN units and set them up, initialized them and deployed a mini-SAN right there on the conference table with snapshotting and replication. I thought, ‘The EqualLogic SAN goes together so easily. It's hard to make a mistake. The way the wizard walks you through the deployment and set up, it's almost foolproof.’”

The Cornell Lab of Ornithology purchased eight units of Dell EqualLogic PS5000E iSCSI SAN, and placed four of the units in its data center and four in a remote site on campus, giving the Lab 48 terabytes of high-capacity usable storage at each site. “I got everything set up, and initiated snapshotting and replication,” says Mikolajczyk. “It was easy.”

The Lab filled up the 48 terabytes in a few months and expanded with two Dell EqualLogic PS5500E SANs with 48 terabytes each, one at each site, for a total of 96 terabytes of usable storage at each site.

ELIMINATING SERVER SPRAWL

Meanwhile, Mikolajczyk had decided to eliminate server sprawl by virtualizing 93 percent of their physical servers using VMware ESX Server 3.5. The virtual servers run Microsoft Windows Server 2003 and 2008 and Ubuntu Linux. Among the applications hosted by the virtual servers are Microsoft SQL Server 2005 and Specify, a cataloging system for the Cornell Museum of Vertebrates. Microsoft SQL Server is the backend for the Specify vertebrate catalog, which is accessed by researchers around the world. IT also provides the backend for VMware vCenter Server.

“VMware and EqualLogic are made for each other,” says Mikolajczyk. “They make the perfect consolidation solution for servers and storage and fit together into a manageable whole.” Mikolajczyk used one of the legacy servers that was still under warranty as a hot spare at the disaster recovery site, running VMware. Three Dell

PowerConnect 5424 Gigabit Ethernet iSCSI-optimized switches, two at the Lab's data center and one at the disaster recovery site, connect the EqualLogic SAN units to the servers. QLogic host bus adaptors from Dell round out the solution. “I figured if I throw the best hardware at it and follow all the best practices, then everything should work perfectly,” says Mikolajczyk. “And so far we've found that to be the case.”

FINDING TIME TO WEAR MANY HATS

The Dell and VMware solution have freed up Mikolajczyk's time so that he can fulfill all his responsibilities as IT manager and a one-person IT team. “I spend much less time managing servers and backup with Dell EqualLogic and VMware,” he says. “I don't have to log on to the Dell EqualLogic SAN more than twice a week. I have a lot of responsibilities on top of my network administrator hat. I've got to deal with managing a firewall. And I've got to manage the desktop support staff, and make sure the helpdesk isn't getting bogged down. I have to manage a budget and make sure the whole operation works. I wouldn't have time to manage operations if it weren't for Dell EqualLogic and virtualization.”

6-HOUR RECOVERY TIME OBJECTIVE

The Lab takes snapshots every 24 hours and replicates data every six hours. Recovery point objective is six hours and recovery time objective is six hours. “I can bring up the whole shadow network in six hours,” says Mikolajczyk. “I have actually tested this from the comfort of my sofa.”

The team has found that expanding the capacity of storage takes only one hour with no downtime with the Dell EqualLogic storage. "I can buy another EqualLogic PS5000E unit today and walk into the server room, plug it in, hook it into the same switch, turn it on and add it to the existing group. That modularity is key to what makes EqualLogic so unique," says Mikolajczyk. "If we had tried to do this with the legacy SAN, we would have had hours of downtime."

SIX-FIGURE SAVINGS

A major benefit for the Cornell Lab of Ornithology is the savings realized from moving from the subscription-based backup service to Dell EqualLogic storage. "We would have been spending six figures easily with monthly subscription fees if we had continued along that path," says Mikolajczyk. The Lab is also saving power and floor space. "With the virtualization solution on the Dell PowerEdge server and Dell EqualLogic storage, we've filled up one rack, whereas before we had three racks filled up with servers alone," says Mikolajczyk. "We're also drawing 83 percent less power with virtualized servers."

Recently, the Cornell Lab of Ornithology upgraded its Dell PowerEdge systems to Dell PowerEdge R610 servers with Intel E5520 processors. The Intel processors provide embedded hypervisors, expanded memory and I/O. "The powerhouse Intel Xeon processors offer better overall system performance for virtualization and more virtual machines per server capacity," says Mikolajczyk.

The Cornell Lab of Ornithology has Dell ProSupport with four-hour response time on servers and 24-hour response time on the EqualLogic SAN units.

"I have complete confidence that Dell will respond as needed should we require support," says Mikolajczyk. "It's the synergy of the Dell tools and VMware along with the excellence of Dell service that have enabled me to put together what I like to believe is a top-notch IT department. The most important benefit we get from the Dell solution is that it's a well-functioning machine that practically runs itself. That makes my life easier."

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