Case Study

INDUSTRY
Energy

LOCATION
Tucker, Georgia

SOLUTION
Primary, secondary, and remote storage architecture that incorporates a Wide-area Data Services (WDS) appliance and provides storage support for:

- Fast disk-based data protection
- Automated remote disaster recovery with streamlined replication and efficient WAN compression and throughput
- High-performance and reduced storage footprint supporting more than 160 VMware-based virtual machines
- Consolidated file shares
- Multiple applications

DATALINK SERVICES

- Analysis
- Design
- Implementation
- Management
- Support

BENEFITS

- Eliminated tape and backup-related production downtime
- Reduced backup and recovery time from one-two business days to just minutes
- Achieved fast remote replication over WAN connection with more than 60-percent data compression
- Delayed purchase of more costly WAN connection
- Reduced disk space required by VMware environment by more than 60-percent through deduplication
- Decreased maintenance costs and avoided a $1 million investment in a new tape backup system
- Decreased management costs and reduced staff time required to manage infrastructure

GSOC sees across-the-board savings with new storage architecture.

THE CUSTOMER: GEORGIA SYSTEM OPERATIONS CORPORATION

Georgia System Operations Corporation (GSOC) is an electric utility serving suburban and rural Georgia as the system operator that controls and monitors electric generation, transmission, and distribution assets owned by sister companies Oglethorpe Power Corporation and Georgia Transmission Corporation, member-owners, Georgia electric membership corporations, and other customers.

THE CHALLENGE: TROUBLED BACKUP ENVIRONMENT NEEDED AN OVERHAUL

As GSOC's data environment continued to grow with everything from file shares to Oracle® data, the organization's tape backup infrastructure had begun showing serious signs of strain. It was not uncommon for nightly backups to take well over 24 hours to complete. Backup-related downtime had begun to eat into production cycles. Recovering even a single file from tape had also become a frustrating, often multi-day, exercise.

Clearly, a better approach was needed. Both GSOC Manager of Technology Systems Ivan Kahn and Garnett Fender, the organization's senior database and storage administrator, knew they wanted to invest in a disk-based backup architecture instead of just upgrading the tape system. This was the next logical step for dramatically shrinking backup and restore times.

By their own admission, however, their first foray into disk-based backup proved disappointing. Pairing virtual tape library (VTL) technology from one vendor with storage hardware from another vendor, the GSOC team found several weak links that prevented them from realizing the true benefits of disk-based backup. "We just couldn't drive the VTL technology as fast as we wanted," said Kahn. "Bottom line: that solution wasn't going to work in our environment."

"Datalink has always been proactive at keeping us informed of our options and the technologies out there. With our prior tape infrastructure, we appreciated having Datalink as one source to go to – especially when we were dealing with software from one vendor and hardware from another."

IVAN KAHN
MANAGER OF TECHNOLOGY SYSTEMS,
GEORGIA SYSTEM OPERATIONS CORPORATION

THE SOLUTION: ENGAGE FOR BACKUP AND BEYOND

GSOC had been a long-time Datalink customer with its initial tape-based backup solution. When GSOC's first efforts at disk-based backup fell short with another vendor, Kahn and Fender were happy to consider Datalink – along with Datalink's recommendation of NetApp® technology – for the next disk-based backup solution.

Said Kahn, "Datalink has always been proactive at keeping us informed of our options and the technologies out there. With our prior tape infrastructure, we appreciated having Datalink as one source to go to – especially when we were dealing with software from one vendor and hardware from another."

Doing their own due diligence and research, Fender and Kahn had assembled a short list of top storage vendors to participate in the RFP. Not wanting to risk another disappointment, they'd also decided any top-line RFP winners would then be subject to a lengthy technical analysis and testing process before GSOC made its final decision.

In this case, it was the right mix of technology and experience that ultimately tipped the scales. "In 60- to 70-percent of the categories we evaluated, NetApp technology was head and shoulders above virtually all of the other solutions," said Fender. The key was the NetApp system's support for multiple environments and network protocols, as well as its backup and replication software. In the RFP's vendor category, Datalink also scored at the top of the scale. "Datalink presented us with the best technology and also won on all three main criteria we used to evaluate a vendor," Kahn noted.

Having already determined they wanted a three-tier data protection architecture, GSOC then turned to Datalink – and its expertise in helping numerous Fortune 500 companies improve IT effectiveness – to help them design and implement their vision. The organization achieved its objectives with a primary NetApp Fabric-Attached Storage (FAS) system to hold most of the production data and backup snapshots, a secondary NetApp FAS system to locally replicate backups, and a third, offsite FAS system that receives daily asynchronous replication of backup data from the secondary system.

In all, the primary system now stores roughly 30 terabytes of data and supports the storage needs of what was previously four large file servers; multiple file shares; environments housing Microsoft® Exchange, Oracle®, and Microsoft® SQL Server®; and more than 160 virtual machines running under VMware®

THE BENEFITS: A STREAMLINED DATA CENTER

What began as a backup overhaul became the central cog in a data storage architecture that has driven the streamlining of virtually every part of the data center. "We built our entire data center to take advantage of this solution," said Fender. "The results of this exercise have been well worth it."

Period: Last Week | Type: Optimized | Traffic: Bi-Directional | Refresh: Off | Go

Port	Reduction	LAN Data	WAN Data	Traffic %
Total Optimized Traffic	(62.64%)	4154.5 GB	1552.3 GB	—
10566 (SnapMirror)	(62.57%)	4138.9 GB	1549.2 GB	99.62%
80 (HTTP)	(88.04%)	12.6 GB	1547.3 MB	0.30%
139 (CIFS:NetBIOS)	(28.66%)	1587.0 MB	1132.3 MB	0.04%
445 (CIFS:TCP)	(66.00%)	1385.9 MB	471.3 MB	0.03%
5723 (Unknown)	(0.00%)	34.6 MB	37.6 MB	0.00%
135 (epmap)	(56.49%)	21.1 MB	9399.6 KB	0.00%
25 (smtp)	(45.32%)	3343.7 KB	1828.4 KB	0.00%
2967 (ssc-agent)	(0.00%)	2100.3 KB	2173.9 KB	0.00%
1069 (cognex-insight)	(0.00%)	802.6 KB	1165.5 KB	0.00%
1086 (cpiscrambler-lg)	(0.00%)	61.6 KB	76.0 KB	0.00%
1200 (scol)	(4.24%)	26.0 KB	24.9 KB	0.00%

Using WAN optimization technology, GSOC has seen significant reduction in network traffic and bandwidth requirements.

Flexible primary storage that speeds critical production systems
GSOC has expanded its use of storage well beyond backup and recovery. Given the system's multiprotocol support from the same box, GSOC uses the Common Internet File System (CIFS) protocol on the primary system to access file data, network file system (NFS) protocol to speed its VMware environment, Fibre Channel for Microsoft® Exchange, and a mix of Fibre Channel and iSCSI for its Microsoft® SQL Server® environment. "Everything in our data center now runs on that array," said Kahn, who has since seen across-the-board improvements in application performance, along with the ability to save roughly $200,000 in costs after consolidating four large file servers onto the new system.

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Vast improvements in service levels for data protection and disaster recovery

Today, GSOC no longer uses tape for routine backups. Instead of taking longer than a day, the nightly backup process occurs in minutes – and in some cases, seconds. Microsoft® Exchange and other databases no longer need to be put into backup mode while the backups are performed. This is due to the non-disruptive disk-based Snapshot™ and SnapManager™ technologies, which focus on quick captures of block-level changes since the last backup.

Recoveries are also now a matter of minutes. "Before, if a user wanted a file back, it could take one to two days. Now, they just put in a call to customer service. With a few clicks of the mouse, we're done," said Kahn. Likewise, restoring an entire virtual machine takes under an hour, instead of the day or more it used to take to get the backup tape. SnapMirror works equally well for remote replication, so GSOC would be able to resume operations quickly after a potential site-wide disaster.

Data compression that reduces storage size in transit and at rest

Given the large amount of primary and backup data now stored locally and transmitted across GSOC's 20-Mbps WAN pipe (having since been upgraded to 50-Mbps), Datalink recommended GSOC add two technologies to its current design to help significantly reduce its data load. The first, a Riverbed Wide-area Data Services (WDS) appliance, proved itself the best candidate to reduce WAN bandwidth requirements among other vendor solutions tested. It also allowed GSOC to postpone investing in a more costly WAN connection. "Datalink brought in the Riverbed solution, turned it on, and it's worked ever since," said Kahn. "Other vendors' products required a whole lot of effort and just didn't function as well." Kahn and Fender have since seen the solution compress SnapMirror transmissions by 60-percent or more and reduce daily transmission times by many hours.

The second key technology that has helped GSOC significantly decrease data loads is NetApp deduplication, which has decreased the disk space needed for growing areas like VMware and disk-based backups by at least 60-percent.

A storage workhorse for VMware

With its recent move to server virtualization, GSOC's confidence in its investment continues to grow. When asked about the impact of the storage on GSOC's VMware environment, Kahn said: "I'm not sure how we'd live without it. If you're going to run VMware, you've got to have a shared storage solution. In our case, we wanted one that did more than just spin a bunch of disks." Initial tests of NetApp supporting VMware via NFS and slower SATA disk drives performed significantly faster than GSOC's prior storage solution running Fibre Channel.

High performance and deduplication space savings continue to be common with the new design. Fender and Kahn have also been impressed with how well the replication and cloning software work with VMware. "In the VMware world, the combination of snapshots and the FlexClone® capability lets us perform recoveries in a fashion that physically wouldn't have been possible before," said Fender. Kahn also noted, "There are definite advantages to combining NetApp replication and VMware that will significantly change our capabilities during times of disaster. Instead of going through all the steps we used to follow, we can automate most of the DR process."

THE OVERALL EXPERIENCE: EXCELLENCE WITH EVERY INTERACTION

As Kahn and Fender look back on the experience, a few final thoughts come to mind. "This was a huge project, one of the largest single projects we've undertaken, and having the partnership with Datalink really helped to make this a success," Fender said.

"Datalink responded to our RFP completely and thoroughly, answered all questions asked of them, gave us a competitively priced package, and worked with us shoulder-to-shoulder to get everything done even when there was an issue. They also got it done on time. We finally have a solution we're very happy with and a company we're still very happy with," Kahn said. ■

Making IT happen

A complete data center solutions and services provider, Datalink helps Fortune 500 and mid-tier enterprises get the most from every IT investment – with storage, server, and network expertise across the infrastructure. We deliver greater business results throughout, designing what we sell, deploying what we design, and supporting what we deliver.

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