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SUCCESS STORY:

National Pathology Lab Solves Data Management Crisis, Slashes Overhead with CommVault Galaxy

QUICK FACTS

Industry/Solution:
- High Technology

Platform/File System:
- Windows, AIX and Linux

Application(s):
- Backup and restore for MS Exchange and SQL servers

Challenge:
- As ARUP Laboratories added more servers, and as the amount of data to be backed up grew, it became more and more apparent that the existing backup hardware and software solution was inadequate. Backup windows were actually beginning to overlap. By the time a server got backed up, it was time to start backing it up again. The backups for a lot of the servers were getting too big to fit on one tape, so somebody had to come in the middle of the night and swap in a new tape. It was becoming a huge management overhead issue. There were also far too many opportunities for failure: equipment failure, software failure, or, most commonly, human failure.

Solution:
- CommVault Galaxy Backup & Recovery
  - AUX Copy

Benefits:
- High performance backups cut administrative time as much as 80%
- Granularity allows faster restores, saves administrative time
- Remote management allows administrators to access the storage management process without coming in to the office on weekends and nights
- No need to add extensive new infrastructure to support Galaxy

Customer Profile

ARUP Laboratories was formed in 1984 as a full-service reference laboratory by the Department of Pathology at the University of Utah Health Sciences Center. Located in Salt Lake City, Utah. ARUP has 1,400 employees, and is one of the leading pathology laboratories in the United States. ARUP performs specialty, esoteric testing that supplements the diagnostic testing available in local communities. They provide services for clients and hospitals throughout the United States, including university teaching hospitals, multi-hospital groups, major commercial laboratories, group purchasing organizations, military and government facilities, major clinics, and major pharmaceutical firms. ARUP also provides all laboratory services for the 490-bed University of Utah Hospitals and Clinics.

Data Management Environment

The mission of the IT department at ARUP is to support the functionality needs of the rest of the organization. IT is responsible for the networks, computer systems, telecommunications, and email.

All of ARUP's operations are in one location, in Salt Lake City. Business applications, e-mail, development, and a wide variety of clinical applications are supported by a network of about 45 servers, mostly IBM hardware running in a Microsoft Windows environment. The facility also includes a number of UNIX (IBM AIX) and Red Hat Linux servers. The UNIX servers support the interface engine that connects ARUP to its clients - hospitals and laboratories across the country. The Linux servers are the lab's Web servers, and also support some internal network performance monitoring applications.

"The UNIX systems are critical for us," explains Bryce Limb, IT Systems & Support Manager. "If the interface engine is down for two or three hours, we have serious trouble. The interface engine lets us send test results to clients, who in turn send them to physicians and patients. Getting those results is always critical."

The Windows servers run a wide range of business applications and clinical applications. Many of the clinical applications are "wrap-around" applications. That is, they are wrapped around the PathNet Laboratory Information System (LIS), which runs in a VMS environment. "We do a great deal of development work in-house here to enhance the productivity of our people and our systems," explains Limb.

These "wraparound applications" run on Microsoft SQL servers, and are very important. "For example," says Limb, "we took the Specimen and Order Entry function away from the LIS and wrote our own applications that did the job better. This application is what we use when a specimen comes in from a client to identify the patient and define what tests need to be done. It's fundamental to our operations."

Network Infrastructure

ARUP Laboratories communicates with some clients via dial-up connections, but most clients are hooked into ARUP's VPN (Virtual Private Network). The VPN is a LAN-to-LAN VPN that gives clients 24x7 tunnels into the ARUP system, providing secure communications across the Internet. Internally, the ARUP local area network (LAN) has about 1,500 nodes, about 800 dedicated to the clinical applications, and 700 to business applications.

Storage Infrastructure

CommVault Galaxy is the data and storage management software for all 45 Windows, UNIX, and Linux servers. Data storage is primarily IBM RAID units, all direct attached to servers. However, ARUP is in the process of migrating to a SAN (Storage Area Network) architecture. Currently, backups are done across the LAN to a Spectra® 64K tape library with eight AIT3 drives and 225 cartridges, for a total capacity of 32 terabytes. On all 45 servers, ARUP runs differential backups nightly and full backups every weekend. For SQL servers, they run transaction log backups about every four hours, daily differentials, and weekly full backups. The information being protected by the backups is a mix of clinical data, business data, and Microsoft Exchange email. The weekly full backups total about 1.5 TB.

SUCCESS STORY: ARUP Laboratories

More Than "Mission-Critical"

The information being protected by Galaxy at ARUP Laboratories is mission-critical for the laboratory and their hundreds of clients, but it is also vital to thousands of patients every day. "To put it in human terms," says Limb, "if it's your child's clinical information, you definitely don't want us to lose it. We simply can't lose information. It can absolutely impact the lives of the patients for whom the tests are being done."

A Storage Management Crisis

ARUP installed CommVault Galaxy software in November 2001, in response to a worsening problem with their previous backup software, VERITAS Backup Exec. Prior to the acquisition of Galaxy, each server was backed up to a dedicated tape drive. "At that point there were about 40 servers," says Limb, "so we had 40 servers and 40 tape drives to manage. As servers were added and the amount of data to be backed up grew, it became more and more apparent that the existing backup hardware and software solution was inadequate. Backup windows were actually beginning to overlap. By the time a server got backed up, it was time to start backing it up again. The backups for a lot of the servers were getting too big to fit on one tape, so somebody had to come in the middle of the night and swap in a new tape. It was becoming a huge management overhead issue. There were also far too many opportunities for failure: equipment failure, software failure, or, most commonly, human failure. It was becoming a huge problem."

"It felt like we were spending about 23-1/2 hours a day doing backups," says Senior Network Administrator Doug Ketchum. The reality was only a little less discouraging: about six hours per day, or most of the day for one person. "We realized we needed a real solution to the problem," says Limb. "We put together a team to evaluate products. We looked at options, we looked at the software available, the different tape library products available, and we ran our ROI analyses. As a result, we chose CommVault Galaxy backup and recovery software and the Spectra Logic tape library. We did pilot tests with those products, which confirmed our choices, and we bought and installed the new system."

The Galaxy Solution

"Now, instead of having 40 servers, each with an attached tape drive, and having to go around and swap tapes for each individual server, multiplied times 40, we just back up everything to the library over the LAN," says Limb. The Galaxy software schedules all the backups and triggers them automatically." ARUP has a 3-shift operation, but some of the servers are less busy at night, so it's best to back them up then. Galaxy software lets ARUP schedule very flexibly, so the backup schedule is driven by the workload of the servers.

Restores are Done in Minutes

The Galaxy software has had a huge impact on ARUP's ability to restore files. The IT department has one file server used just to restore lost or damaged files. Before Galaxy, it took hours to restore a specific file. Now it takes just a few minutes. "The same thing is true for all applications," says Limb. "It used to take days to restore a SQL database. Now, with Galaxy, it takes just a few hours. With patient files, if a file is damaged or deleted, it's always important to our client, the hospital or lab, and it's important for the patient. It's always urgent to get the files restored, from a customer service point of view."

"Another thing we really like about Galaxy," says Limb, "is that it lets us get down to a very low level of granularity. For example, you can restore a single MS Exchange email message. And that granularity is true across the whole Galaxy functionality. For example, if we need to restore an SQL Server 2000, Galaxy lets us restore a single table. We don't have to restore the whole database. That saves a lot of administrative time, saves the user time, gets the user back up and running on the application faster, and it means we have our systems more available, doing what they need to be doing."

Remote Management

Galaxy also allows ARUP to do remote management of the backup process. "With our previous backup software, VERITAS Backup Exec," says Limb, "if there was a problem, somebody had to come on site and fix it. Now, an administrator can get on his PC at home, get on the VPN, and pull up the management GUI just like he was sitting at the console in his office in Salt Lake City. Doug Ketchum lives about 50 miles away during the week, but on weekends he lives about 300 miles away. In the old days, if he needed to come in to fix something, it would take him six hours just to get here. Now, he just gets on the VPN and fixes it."

"I hardly every need to fix anything," says Ketchum, "but I often just look in on the system over the weekend. And remote management makes a difference during the week, too. Even if I'm only 50 miles away, if I had to come in to the office it's still an hour ride. Galaxy lets me do it remotely, which saves an hour."

AUX Copy for Archiving to Off-Site Location

When they complete a full backup, ARUP uses the AUX copy capability of Galaxy to copy to another tape. They send the AUX copy to an off-site archive location. The AUX copy allows them to go back to find something if the primary data is no longer on the system. "We usually have 30 to 60 days of backups in the tape library at any one time," explains Limb. "But if the backup was older, it's not on the system, we can go to the AUX copy in the archives. Sometimes people don't realize that they've lost something until months later, when they go back to look at the information again. We can go into the archive, get the tape, and bring it back here."

Why Galaxy?

Among the primary reasons for selecting Galaxy, Limb cites granular data restores and lower infrastructure cost. "The granularity is a big thing for us," says Limb. "Other vendors couldn't offer it, or could only offer it as a third party application, and we didn't want anything to do with that. We wanted everything under one roof. Some of the other vendors asked us to spend a lot more money on infrastructure. One vendor wanted us to install four servers, which would have cost about $60,000, to do what we do with Galaxy on one $10,000 Windows server."

Time Savings

The biggest payoff for ARUP has been in administrative time. Savings have been substantial and easy to measure: the backup process that was taking six hours every day, five days a week, is now taking one or two hours a day. "In the past, doing the backup was almost a full time job for one person," says Ketchum. "But Eric Hansen and I also have a lot of other things we are responsible for: all the servers, the networks, the VPNs, email, etc. It's a big load of responsibility. In the past, it took most of one person's time to do the backup part. Now, with Galaxy, we can spend much more time managing all the rest of it, and doing it much more easily and effectively."

The new backup solution is also a better use of financial resources, Limb believes. "When we had a tape drive attached to every server, you figure that's a $5,000 tape drive times 40 servers. The library we replaced the attached drives with is not cheap, but we think it's a better investment." Limb estimates that the initial cost of the new backup solution, including library hardware, installation, and media, is about the same as the previous solution. "But," he says, "the payback comes from the reduction in management, operation, and restore time."

Smooth Installation

"The CommVault people were very helpful during installation," recalls Limb. "Basically, our feeling was they were ready and willing to do anything we asked them to. Technical support since then has been great. We can call at two or three in the morning and they get someone on the line who can help us out, tell us what it is we don't know."

Future Plans

ARUP is currently in the process of moving to a SAN. "We've already bought the CommVault software to support the SAN," says Limb, "and we already have the equipment in. We will start migrating servers to the SAN starting now, going out over the next 4 to 6 months. In total, it could take a year to get everything moved."

When the SAN is installed, all the servers will back up across the SAN to the library, rather than over the LAN. The CommVault SAN software has the ability to handle flash copying. Galaxy will automatically allocate the disk space for the flash copy and handle all the scripting required. "That will save us a lot of time and people resources," says Limb. "But more important, going to the SAN will mean we are not backing up across the LAN. That means we don't need to beef up the LAN with new switches, etc. LAN switching costs are very high, and I would estimate that our next upgrade to handle additional backup traffic, if we needed it, would cost between $350,000 and $500,000."

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