Diskeeper Defrag Starts New Tradition At Historic Prep School

Defragmentation initiative increases performance and reliability as history marches on

By Douglas Glenn Clark

The Trinity School in New York City is nearly 300 years old and has quite a history. So does its database. Each week both grow in obvious and imperceptible ways. And no one is more aware of the significance of this fact than David Alfonso, the school's director of technology.

Alfonso oversees the school's 600 workstations and 30 servers that organize and preserve a vast array of data: about 900 gigabytes of student, administration and faculty files; an additional 500 gigabytes that includes client images and the campus software distribution server; and, finally, a 3 terabyte backup system. It is his job (with the help of five staffers) to make certain that 1.25 million – and counting – files be digitized, saved and backed up. Failure to do so would make Trinity, in a word, history.

But when Alfonso joined Trinity about six years ago, he inherited a Microsoft Windows network that had withstood the test of time but was slow and inefficient. These telltale signs made it fairly easy for an IT expert like Alfonso to diagnose the disease: disk fragmentation. This insidious problem is common among institutional systems of all kinds; yet without proper treatment it can turn a network slowdown into a database meltdown. Alfonso knew he had to take action.

"When I came on board nothing much was being done." Alfonso said. "But we have more than a million files, a hundred and sixty teachers and a thousand students who delete and add files every day. From a data perspective, that's a lot to deal with."

Not to mention that while Trinity looks and sounds like a K-12 school, in fact it functions more like a corporate enterprise. Besides educating generations of New Yorkers, the institution owns and operates five buildings, including a 30-story apartment complex located at the main school site on West 91st Street. Therefore, Trinity's computer capability necessarily strives to accommodate the cross currents of education and commerce.

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"This content includes pictures, videos, audio and about 15 years worth of miscellaneous documents and network based application data files. Now add to that the explosion of multimedia that has resulted in significantly higher space requirements, as well as Trinity's internal communications and development office that produces its own magazine and newspaper," he said. "Most Trinity students enroll in kindergarten and stay through the twelfth grade. They save their body of work on the system. And our teachers, some of whom are 20-year veterans, add to their curriculum and save tests and tutorials, all of which become part of the database."

Disk fragmentation occurs as a multitude of

files are added, modified and deleted. Despite ample blocks of available storage on the hard drive, in the Windows universe files often are not written in one contiguous space. Rather, they are separated into fragments and sowed – like wild oats – across the hard drive terrain. When trying to retrieve data, imagine first having to collect individual seeds that, in effect, have been scattered in the wind. This is why fragmentation will slow down and eventually cripple an otherwise healthy network.

Fragmentation is often the cause of slow boot times and boot failures; aborted backups; file corruption and data loss; program and process failure due to slow I/O; destabilization of networks and the costly premature failure of hard drives. Like any ailment, human or technological, lackadaisical treatment can lead to devastating outcomes.

Alfonso wasted no time integrating a third-party defragmentation solution and implementing a maintenance routine. Naturally, the process was scheduled for weekends, when there would be less traffic from staff and students. Ideally, with two days to complete a defragment, the Trinity community would return each Monday to a more reliable network that allowed faster access to data, including e-mail. But the even the best-laid plans go awry.

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The software's failure to properly defrag the system added to Alfonso's woes. A beleaguered system meant that backup of the school's million plus files moved at a glacial pace. Also, the schedule for recycling hardware was compromised: each year about 125 workstations – about one every three days in a calendar year – are replaced with new units that must be loaded with up to 15 gigabytes of data. The transfer of complex files remained a time-consuming ordeal.

A New Tradition Begins

When he could no longer tolerate lackluster performance, Alfonso said he was forced to "revisit" the issue of fragmentation. He had heard about a software program created by Diskeeper Corporation, a multi-national corporation with headquarters in Burbank, California, that was capable of solving millions of fragments across multiple volume and file types, while maintaining peak performance. And it was said that the program could work its magic even on systems with as little as 1 percent free space available.

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He was also intrigued with the claim that the software could do its work in the background, while the Trinity network was performing a multitude of other tasks. This alone would improve his team's productivity with no heavy expenditure needed from the school. In late 2006, determined to "eke out a better performance" from the network now operating with Windows XP and Windows 2003, Alfonso decided the time had come to give Diskeeper® with InvisiTasking ™ a try. The rest, as the saying goes, is history.

Alfonso started with Diskeeper on just a few servers and workstations. It worked so well he was encouraged to install the software in the Trinity library and two computer labs. The lab machines were a good test because they are heavily used by about 600 students and become highly fragmented as innumerable temporary files are cre-

ated. The labs now run smoothly and the speed of log-in times has improved considerably, thanks to Diskeeper.

"We've seen a two-fold increase in speed with Diskeeper. It speeds our deployment time for loading new hardware from 25 minutes to about 12 minutes," he said. "At peak times we may be imaging 20 systems simultaneously. Prior to Diskeeper our file transfer rate peaked at about 400 megabytes per minute. Now we peak at about 1 gigabyte per minute," he said, adding, he also uses Symantec Ghost, which assists in migration of files.

About two years ago, Alfonso considered fully "virtualizing" the Trinity environment. But after extensive testing he concluded that physical servers were still significantly faster and better than virtual servers. However, he did duplicate all physical servers in a VMware Inc., environment. "This allowed us to failover to a virtual server in case a physical server failed. Most physical servers are synchronized with their virtual peers on a regular basis. Exchange and SQL servers are synchronized via backup-restore mechanisms."

Overall, the functionality of Trinity's 30 servers has improved significantly with Diskeeper. Virtual servers are much more responsive, while SQL and Exchange servers provide faster file transfer and transaction rates. In short, Diskeeper defrags while backing up and restoring all files at a faster pace than the previously used software.

Also, Alfonso no longer has to schedule defragging procedures because Diskeeper works using its InvisiTasking technology to defragment by relying on idle system resources whenever available. This is an enormous step forward because it is no longer practical for contemporary enterprises – schools, government agencies, financial institutions, etc. – to schedule defrags when it is common knowledge that "off hours" is a thing of the past. Diskeeper designers know that in today's world, organizations add something new to their systems virtually every minute of every day. As for Trinity, many teachers are following the national trend in prep schools and colleges to make all course work and related materials digital so that everything can be available online. As a result, the exponential growth of the school's database is staggering. And as file sizes and disk capacities expand, fragmentation runs rampant. Fortunately, when progress sparks new worries, Diskeeper innovations provide creative solutions.

"With the old software if you tried to run a backup and do a defrag at the same time, you had a problem. Now Diskeeper continues working behind the scenes without interrupting your daily work schedule. If you keep things defragged, it maintains the system's efficiency, and it doesn't impact those high-load times when you're doing backup," he said.

Alfonso's discovery of Diskeeper innovations was timely for another critical reason. Trinity School was founded in 1709 as a charity school by the Society for the Propagation of the Gospel in Foreign Parts. At the time, less than 40 boys and girls were enrolled. Since then the school has undergone incredible change, but perhaps nothing as profound as the communications explosion and the advent of e-mail and instant messages.

New rules for electronic discovery of documents in civil court cases are now in effect. Corporations and other institutions could be subject to stiff fines if they fail to comply. This puts more pressure on technology directors like Alfonso who must provide a means for retention and access of all e-mail and instant-message files.

It will also cause a huge expansion of the Trinity database: e-discovery mandates that all e-mails and related data be preserved for a minimum of one year and, in some cases, up to seven years.

Despite the dawning of a new age, Alfonso is confident that Diskeeper's progressive credo will assist him – today and tomorrow. "When you start looking at backup windows possibly growing and the time it takes for the imaging of new machines getting longer and longer, you know you better have a great defrag software that can handle the load. I think we'll be OK. With Diskeeper we're in good hands."

For more information, contact Diskeeper Corporation at 7590 North Glenoaks Blvd. Burbank, California, 91504; phone 818-771-1600*; fax 818-252-5514; or visit www.diskeeper.com.*

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