Windows® IT Pro

Improved Reliability is within Your Grasp

System Reliability Improvements and Benefits with Diskeeper®
Defragmentation Technology
October 2010

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Improved Reliability is within Your Grasp

Introduction

In the IT world, non-users of defragmentation software - and those who have only experienced the severely limited capabilities of the Microsoft Defragmenter built into Windows - sometimes view defragmentation software as a nice-to-have system performance enhancer. Without first-hand knowledge of a truly powerful and effective defragmentation tool, it's easy to assume that it probably isn't a requirement for IT to deliver the best performance and reliability from the hardware for which they are responsible.

However, defragmentation software is no longer the unknown in the IT world that it once was. A recent Windows IT Pro survey of Diskeeper® per-formance software users shows that senior IT man-agement doesn't require educating or convincing that preventive, proactive defragmentation of the hard drives in an enterprise system has an over-all positive effect on the IT environment.Survey respondents reported over and over again that they clearly see the automated defragmentation and disk management tools Diskeeper technol-ogy brings to the table as an essential component of their IT department's ability to deliver the most efficient and reliable computing environment to their business.

For this paper, the conclusions drawn and the examples discussed are from the above-mentioned Web-based survey conducted in September 2010. The survey was sent to a target audience currently using Diskeeper performance software, including IT Pros,BDMs, and TDMs.The survey questions clustered into three categories:
* System reliability
* System performance
* Business improvements and benefits

Respondents were asked questions regarding specific reliability improvements they've experienced with Diskeeper on their systems such as reduction of unnecessary I/O activity, fewer system crashes, and reductions in file corruptions that result in data loss. They were also asked to comment on the business reasons behind their deployment of Diskeeper (instead of other defragmentation software) and the business benefits they've seen from having Diskeeper in their IT environment.

Almost 400 sets of responses were received. The results referenced in this paper are from these real IT personnel, in the trenches, commenting directly on their own personal experience using Diskeeper every day to optimize their corporate computing environment.

State of the Enterprise

The corporate computing landscape continues to change at a rapid pace. To maintain a business advantage using these technology changes, IT finds themselves in the position of needing to master significant new technologies; not in a gradual adoption as they can be applied, but in a rapid evaluation that allows business to keep pace with their competitors.

These technologies include:
• Server Virtualization
• Client Virtualization
• Server Consolidation
• Public and Private Cloud Technologies
• Green IT

The need to focus on these next generation technologies means that IT has to maintain the status quo within their existing environment. Reducing the need for daily IT hands-on tasks to monitor and maintain existing systems is a key requirement for enterprise software systems. This software also needs to be ready for the new technologies currently being evaluated for deployment and must work with existing as well as future technologies in active use.

Why Diskeeper

Performance improvement has become the expectation of defragmentation software. With an existing view that a defragmenter adds value to both server and client computing platforms, customers implement Diskeeper to improve the overall performance of their computing environment, reduce disk I/O, and keep their systems operating in a performance optimized fashion. Diskeeper

provides this with an active, intelligent, automated defragmentation engine that offers enterprise site functionality that is completely missing in the lite defragmenter that is shipped with Microsoft Windows.

When asked about their reasons for implementing Diskeeper, many respondents replied that they expected Diskeeper to improve the performance of their servers and desktops. But a noticeable percentage of users responded that they were primarily looking to increase the reliability of their equipment and reduce potential downtime. They considered performance improvement with Diskeeper to be a normal return on their investment;the driving impulse behind their adoption of Diskeeper was an expectation that they would see better system reliability on the computers on which it was deployed.

Customer Experience

Diskeeper users have found that the software is reliable, effective, and trustworthy. Many users elect to install it across their enterprise, on both client and server, and offered positive comments on the ease of installation and management. They frequently commented that once Diskeeper was installed they rarely, if ever, found themselves worrying about Diskeeper's function, and found that when they did check on its operation, the application tools gave them clear and informative data about the state of the software and the drives it was running on.

"The only software installed on any server that I never have to worry about"

This customer comment is a good example of how users feel about Diskeeper. There is no anticipation that Diskeeper will have conflicts with the operating system or any applications running on their servers. They trust Diskeeper to make the users' servers more effective, without worrying about some sort of negative interaction with any application running on the server. This customer perspective was continually repeated throughout the survey, in many different forms, but all boiling down to the same thing; customers trusted Diskeeper with their business.

"I wouldn't use Windows without it."

This response was another very common thread from long-term users of Diskeeper. Many users reported that they had originally purchased

Diskeeper for a very specific need; for example, to solve fragmentation problems with database servers. Once they had seen the benefits of the software in their business critical applications, they made the choice to begin deployments to less critical lines of business applications, with many users moving all the way down to the client level, in a very different, top-down deployment strategy. A significant percentage of users making these deployments then began to discover the benefits beyond performance that intelligent defragmentation provides, and also found that the improved reliability of their systems was an unexpected bonus.

For IT, Reliability is the Goal

The dream of the IT department is to be able to configure and deploy systems that will then run with little to no interaction from IT. While the increasing complexity of applications and hardware makes this an unlikely prospect, strong IT departments take all possible steps to minimize potential problems on servers and desktops that they deploy.

Consider the steps that are taken prior to any server or client deployment:
- Standardized operating system is installed
- Standardized utility applications are installed
  - ○ Anti-virus
  - ○ Management/Asset software
  - ○ Remote management/monitoring software
- Standardized line of business applications installed
  - ○ Knowledge worker applications on client
  - ○ Server applications as required on servers

The goal of this process is to assure the deployment of a standardized, tested configuration so that any problems that arise can be dealt with using a known baseline. The process of determining what applications should be installed on each system is driven by both business needs and IT-specific needs.

For example, few IT professionals would deploy systems without a reliable anti-virus application installed. Allowing a malicious software attack on their enterprise will have a significant impact on not just IT, but on the business process, as well.

There is an expectation that IT will deliver reliability to the business computing user. Systems management tools that monitor potential problem areas, anti-virus software to defend the system from external attacks, and tools that allow IT to remote help the console user or maintain the system all have the end goal of providing a reliable system for knowledge workers to depend on.

When getting maximum reliability from your hardware is the goal, our research shows that adding Diskeeper performance software to your standard utility application deployment not only delivers the expected performance boost from the state-of-the-art defragmentation technology but also significant improvements in the reliability of Windows computers running the software,extending the useful life of the hardware. Increased reliability means reduced downtime which results in improved end-user productivity.

Longer Hardware Life

When surveyed on this topic, the majority of long-term users of the Diskeeper performance software reported seeing the useful life of their hardware that is running the defragmenter extended by up to two years, while a notable percentage reported extending the useful life to well into 5 years.
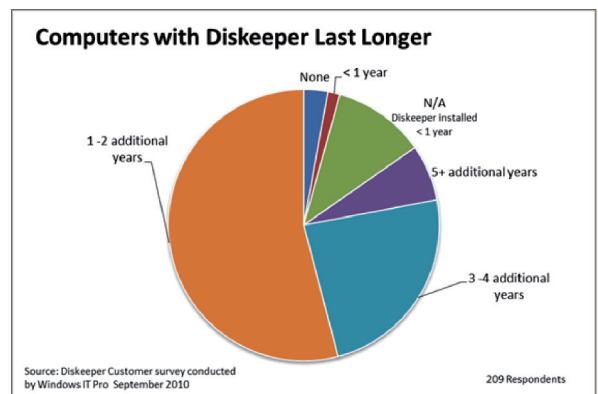
Users reported a variety of reasons for increased hardware life. For example, IT often considers replacing desktop hardware when users consistently complain about the performance of the system. Automated disk defragmentation prevents or delays one of the most common causes of user complaints; an increase in application response time that is most often associated with the user or application waiting for data to be read from or written to the hard disk. With Diskeeper running as an invisible background application continually optimizing disk access and preventing fragmentation, the potential for a negative impact on the user experience is eliminated.

Other reasons for the increase in the usable life of the hardware includes the basic fact that by limiting fragmentation as a disk is used the workload on the disk drive is decreased, increasing the MTTF (Mean Time To Failure) when compared to hard drives that are not running Diskeeper. Reduced workloads on the drives have the corresponding effects of reducing heat and energy consumption which also aid in extending service life.
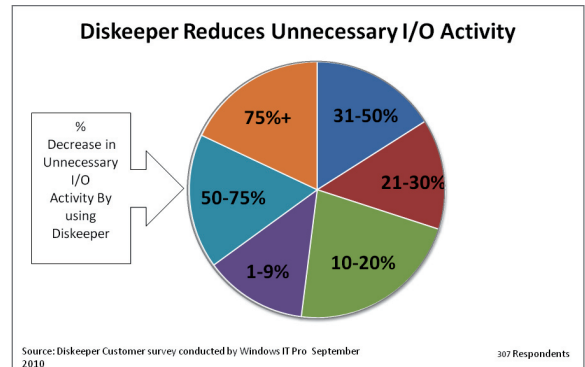
"By drastically reducing hard drive failures and I/O times we have been able to keep our servers on the job longer with no performance degradation."

A common response to our survey relative to extended hardware life came from users who implemented Diskeeper on older systems running production applications and databases. These users reported that they were able to extend the life of these production systems and reported that their databases and servers were running faster and more reliably than prior to the installation of Diskeeper. While the initial thought was that Diskeeper would improve performance of these systems, the collateral impact is that since the performance of the systems was improved it was no longer necessary to replace the underlying hardware.

"One very noticeable benefit is I am only now in August of 2010 replacing Dell Dimension 2400 workstations that were purchased in 2004. Before Diskeeper these systems were bogged down with fragmentation and were noticeably poor performing, with Diskeeper they run like new for far, far longer than they would otherwise. I would have been justified replacing these systems in 2006 or 2007...certainly by 2008 or 2009. For them to be doing the job nearly 6 years later is impressive, considering the tech life cycle being much shorter than that generally."

On servers, these problems become magnified by the increased hardware work load. Disk I/O issues caused by fragmentation, file contention, continual ongoing read/write commands and 24/7 load cycles all put a serious load on the system which often causes components to have a limited lifespan, especially rotating media. In the server world, especially in densely packed rack room and datacenter environments, the reduction in heat generated by disk I/O can be significant, with the savings translating into actual dollars due to

the reduced energy consumption and extended hardware life.

Diskeeper Reduces Unnecessary I/O Activity

% Decrease in Unnecessary I/O Activity By using Diskeeper

75%+ 31-50% 21-30% 10-20% 1-9% 50-75%

Source: Diskeeper Customer survey conducted by Windows IT Pro September 2010   307 Respondents

Reduced IT Staff Workload

Extended hardware life is a great thing for your capital budget bottom line, but the other side of the issue is that older systems often require more IT support. So it would be natural to be concerned that the apparent gains found in longer hardware life are offset by an increase in the amount of IT support required for these systems. And given the limited availability of IT man-hours, if the extended hardware lifespan was achieved only at the expense of greater support requirements, IT would be the first to notice. However, our survey shows that after implementing Diskeeper, this isn't the case; a consistent theme in the reported user experience is that IT devotes less time to maintaining systems running Diskeeper.

"We spend less time taking care of systems."

A large percentage of respondents offered the unsolicited opinion that the Diskeeper "Set It and Forget It"® approach along with the improved system performance and reliability, made them consider Diskeeper an essential component in getting their job done. The automation capabilities of Diskeeper are useful in deploying, managing and monitoring the application installed throughout the enterprise. Users often commented that this ease of deployment and administration were compelling reasons to select Diskeeper for deployment throughout large enterprise computing infrastructure.

Help desk called upon less often
Hard disk health, along with improved performance, goes a long way towards improving the performance of end point computers.

For example faster processing in I/O intensive utility software such as anti-virus software improves the end user experience. However, despite advancements in the behavior of anti-virus solutions, regular full scans of local hard drives means that the scans will invariably interrupt some user process, reducing the apparent performance of the system while it attempts to service the console needs of the user and the background demands of the anti-virus scan.
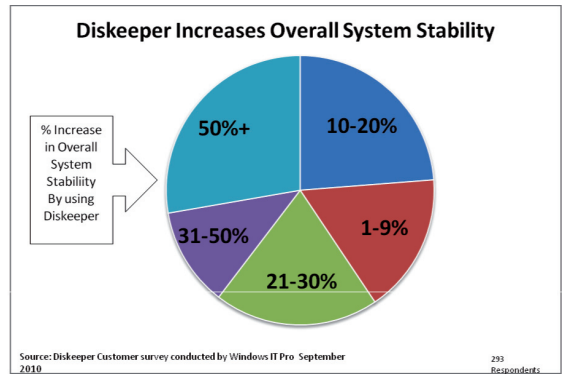
With anti-virus scans completing more quickly, the amount of time that the performance of the system is degraded by the needs of the anti-virus software is reduced, allowing more background operations to take place when system utilization is low, permitting other off-hour operations such as backup, or system updates more time to complete. In a 24/7 operations, with no significant slack periods where system slowdown is acceptable this means that the period of time system performance is reduced by these necessary utility applications is minimized and if there is an available window where such activities can be performed without impacting users, the amount of work that can be done in that time frame is increased.

The performance hit taken by applications while contending for disk resources is often very noticeable to the console user; in fact, end users are notorious for picking up the phone to IT as soon as their user experience begins to change. As Diskeeper improves the performance and reliability of the user's computers the direct effect on IT is that the end user is much less likely to have disk-related problems that will result in a call to the Help Desk, thereby freeing up Help Desk resources to address other problems that are not the result of potential hardware issues.IT users feel that Diskeeper "just works"; they spend less time monitoring overall system health as the number of calls to the Help Desk is reduced.

Reduced System Stoppages

IT intervention with Windows systems is reduced by the overall improvement in system stability seen in systems running Diskeeper. Our survey respondents frequently commented that their systems with Diskeeper were better than Windows installations without the defragmenter.

A 100% of Diskeeper users reported improvements in system stability when using the software

Diskeeper Increases Overall System Stability

% Increase in Overall System Stability By using Diskeeper

50%+ · 10-20% · 1-9% · 21-30% · 31-50%

Source: Diskeeper Customer survey conducted by Windows IT Pro September 2010
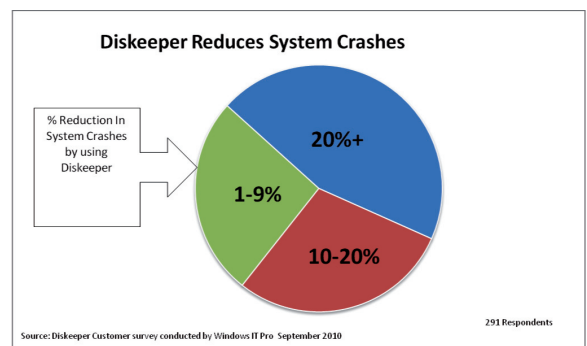
293 Respondents

on an ongoing basis. Many respondents indicated that they had seen unreliable systems that had regular stoppage problems made usable again by introducing Diskeeper on the platform, which completely solved or significantly reduced the random stoppage problems that the systems were experiencing. As many stoppages reported to the IT Help Desk are the result of disk contention issues or other disk I/O problems that are greatly improved by the defragmentation software, this universal notice of improved system stability after installing Diskeeper is not unexpected.

Noticeable decrease in Windows systems hanging or crashing

Windows systems are known to hang when there are disk I/O issues and in the worst case scenario, crash completely. For example, when I/O issues cause the console to become non-responsive, users who are impatient will pick up the phone and call the Help Desk to report that their desktop has crashed.
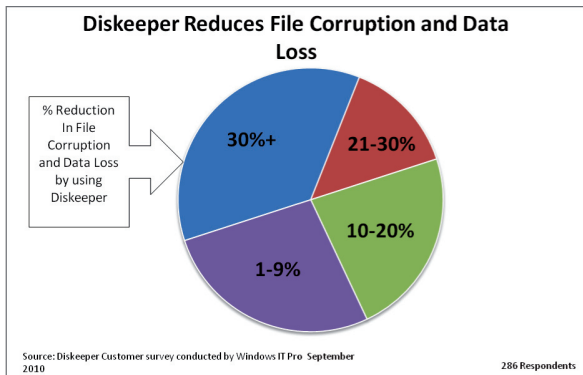
In other cases, this non-responsiveness unfortunately means that users will then force a hard reboot of their computer, switching the power off and on, which often leads to data corruption on the hard drive, and possibly even the operating

Diskeeper Reduces System Crashes

% Reduction In System Crashes by using Diskeeper

20%+ · 1-9% · 10-20%

291 Respondents

Source: Diskeeper Customer survey conducted by Windows IT Pro September 2010

system files, due to the brute force method of shutting down the computer.

Reduced File Corruption

Due to the nature of the way data gets written by the NTFS file system the more fragmented a disk is, the more difficult it is for the file system to write a file to the disk. At some point attempting to write large files to a fragmented disk, even one with significant capacity available, can result in file and data corruption.One Microsoft Support article, Article ID#967351, describes this data loss/corruption case specifically, describing cases where heavy fragmentation can prevent a file copy job from completing or new data from being written to that file.

Because of the automation features and intelligent optimization with its resultant reduction in hard drive I/O, users commented that hard drives failed at a much lower rate compared to the failure rate for systems not running Diskeeper with its automated defragmentation and patented file optimization technologies.

Reducing hard drive failures is significant in many ways; less money spent on new hardware, less time spent on replacing failed drives, no need to do complex drive restorations, reduced application downtime, and reduced user downtime are all benefits that accrue when you reduce the number of drive failures in your organization.

Diskeeper Reduces File Corruption and Data Loss

% Reduction In File Corruption and Data Loss by using Diskeeper

30%+ | 21-30% | 10-20% | 1-9%

Source: Diskeeper Customer survey conducted by Windows IT Pro September 2010

286 Respondents

Diskeeper Reduces Hard Drive Failures

% Reduction In Hard Drive Failures by using Diskeeper

31-50% | 50%+ | 21-30% | 10-20% | 1-9%

Source: Diskeeper Customer survey conducted by Windows IT Pro September 2010

288 Respondents

Diskeeper users reported consistent reduction in problems related to file and data corruption with more than a third of the users seeing more than a 30% reduction in reported problems relating to data corruption and loss. Fragmentation prevention and intelligent optimization feature works to prevent file corruption with users reporting a major reduction of data corruption attributable to disk issues.
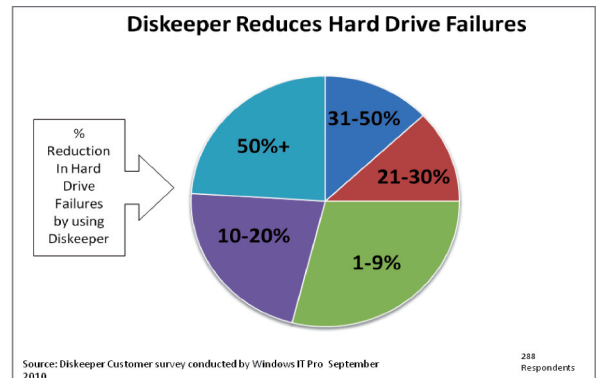
Reduced Hard Drive Failures

Some users reported up to a 50% reduction in hard drive failures over time, and almost all respondents indicated that the need to replace hard drives was notably reduced using Diskeeper. Many users commented that they had budgeted to replace hard drives and found that money unspent, as their past experiences with hard drive failure rates were no longer applicable to systems running Diskeeper.

"I was spending way too much time replacing failed hard drives."

Backup

Many customers reported that their reason for purchasing Diskeeper was to reduce the amount of time required for backup. With limited backup windows and ever-growing amounts of data, anything that slows down backup can have a major impact on allowing a successful backup in a limited time window.

Fragmentation is rarely the first thought that comes to mind when IT is searching for successful backup solutions. There is a tendency to throw hardware at the problem; investing in higher-performance backup solutions or moving to disk-to-disk, or real-time solutions that maximize the speed of hard disk writes in order to minimize the length of time it take to perform full backups.
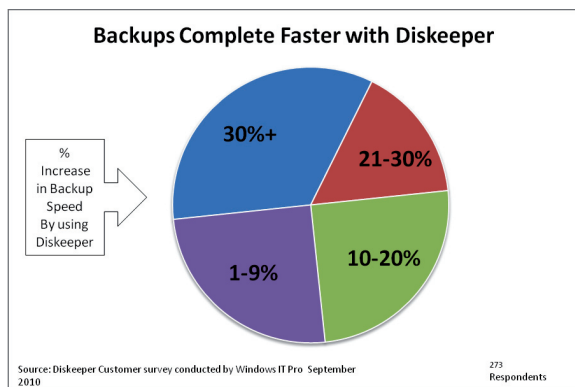
"My backups went from 8 hours to 90 minutes"

While not all users would see such a significant improvement in backup performance, the point is that without making any other changes in their

infrastructures, users of Diskeeper with its well-managed defragmentation application are able to get the most from their backup solution. In our survey, respondents did not find it necessary to invest in additional backup hardware to deal with a problem that was solved by utilizing Diskeeper to properly manage the disk fragmentation issue.
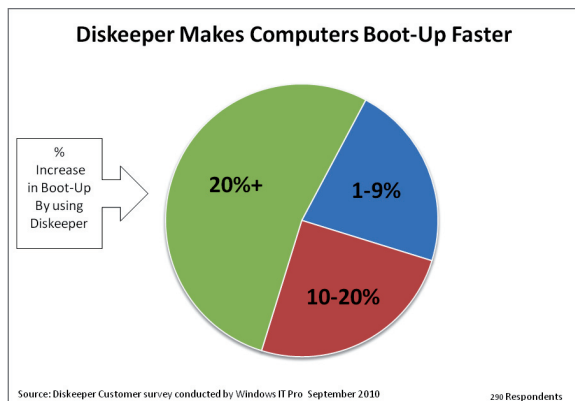
"Faster backups; reduced backup times by hours and reduced the amount of time it took to restore a file."

Data that is properly defragmented and backed up is also faster to restore. This point is rarely considered, but one that is most important. Combined with reduced data corruption, faster backup and restore provides additional benefit to the end user and improves their overall productivity.

Backups Complete Faster with Diskeeper

% Increase in Backup Speed By using Diskeeper

30%+
21-30%
10-20%
1-9%

Source: Diskeeper Customer survey conducted by Windows IT Pro September 2010

273 Respondents

Faster Boot Times
Faster system boot times are primarily considered to be a productivity feature and not one of reliability, however enterprise users of Diskeeper reported much faster boot times as a reliability benefit, given that a slow boot-up can generate user complaints

Diskeeper Makes Computers Boot-Up Faster

% Increase in Boot-Up By using Diskeeper

20%+
1-9%
10-20%

Source: Diskeeper Customer survey conducted by Windows IT Pro September 2010

290 Respondents

to IT, and reduce productivity as users get involved in non-business tasks while waiting for an extended boot process to complete. With the newest versions of Windows featuring faster boot times, allowing disks to get fragmented removes that benefit by slowing down the boot process.

Obvious ROI
Previous research has shown (*Reducing Downtime and Reactive Maintenance: The ROI of Defragmenting the Windows Enterprise, Frederick W. Broussard 2003/Self-Tuning Disk Drives Eliminate Bottlenecks and Heighten ROI, Drew Robb*) that IT has clearly identified the ROI model for disk defragmentation, based solely on the performance improvement available by properly defragmenting hard drives in Windows computers. When you factor in the improvements in reliability and the reduction in demands on IT due to hard-disk related problems, the defragmenting solution becomes even more cost-effective.

Consider the well-defined issue of a help desk call. Significant research has been done as to the actual dollar cost of answering the phone at the help desk. The price is generally tagged at $35 per call for simple problems. If implementing a corporate-wide deployment of Diskeeper in an enterprise with 1000 desktops prevents just one or two calls per client per year to the Help Desk the ROI for the deployment of Diskeeper is rapid and very easily defined.

Disk fragmentation costs the IT department more than just the time necessary to clean up those drives. As our survey has indicated, implementing Diskeeper improves system performance, reduces hardware failure, and improves overall uptime leading to better value being received from the computer system. This additional work that the computer is capable of doing due to the installation of the defragmenting software should be factored in as another piece of the ROI model for the software.

Simple deployment
Part of what makes Diskeeper successful is the ease of deployment throughout the enterprise. Being designed for remote installation and remote management, and tightly integrated with Microsoft's management solutions, such as Active Directory and System Center, means that getting Diskeeper deployed enterprise–wide does not require excessive IT man-hours to accomplish. Respondents in the survey often made mention of

the fact that Diskeeper was quick to deploy, easy to install, and had many features that made for simple management and monitoring.

Rapid results

An ongoing thread in the responses to differen survey questions was that users very often installed Diskeeper to fix problems that were happening at the time of the installation. Allowing Diskeeper to perform its basic fragmentation prevention function allowed users to see immediate results, with the net affect that the investment in Diskeeper had an immediate and noticeable positive impact on those businesses.

"Our hardware was aging quickly and the work-loads were only increasing. We had nearly 100% fragmentation on every single one of our production systems. We were also experiencing hard drive failures at an alarming rate. Users regularly complained of long file seek times, and poor overall performance."

Obviously, the larger and more complex the data storage that Diskeeper is being asked to manage the more time is required for all of the benefits of defragmentation to be available to IT. But this doesn't detract from the rapid results enjoyed, and in many cases expected, when Diskeeper performance software has been deployed into a heavily fragmented data environment.

Improved Business Productivity

While disk defragmentation is often deployed in order to regain lost performance or to prevent performance loss to fragmented hard drives, the full range of benefits that accompany the deployment of a comprehensive managed disk defragmentation solution go well beyond the simple performance gain from less fragmented drives and data.

Reduced system stoppages, improved performance, greater hardware reliability, and a reduction in data corruption, from desktops through servers, translates directly into improved end-user productivity and better user experience.

Case Studies

In addition to the results of the survey we have included two case studies that are excellent examples of the reliability and performance improvements achieved by using Diskeeper performance software across a spectrum of business environments. The two very different computing infrastructures

described both see benefits that made the choice to implement Diskeeper the optimal one for each business.

HCA Healthcare

An excellent case study of Diskeeper with IntelliWrite™ technology at work is HCA Healthcare in Richmond, VA. HCA is a network of 163 hospitals and 105 surgery centers around the country, including facilities in the Richmond area.

At the HCA facilities in Richmond, doctors and other caregivers interact on a daily basis with patient care applications that are based on multiple large SQL Server databases such as a glucose monitoring system that uses 6 SQL databases on a single server. These big applications have a lot of I/O going between databases. If file data isn't properly executed to the application's database, then file fragmentation can result, causing higher than normal server access times. This adds up to a situation in which slow file access could create dangerously slow reaction times for doctors and nurses depending on data in critical patient care situations.

The necessity of maintaining all of these large databases brought an urgent need for reliable, easy-to-manage defragmentation software. The hospitals' IT administrators turned to Diskeeper Corporation's IntelliWrite technology to continuously prevent defragmentation and improve their existing system speed. After installing Diskeeper, the hospitals' issues with slow file access times were virtually eliminated. The IT staff report that the tool also increases read speed, especially on I/O intensive servers.

Jared Mabry is responsible for IT Operations at the two hospital facilities that are part of HCA's Chippenham-Johnston Willis Medical Center in Richmond. He summed up the overall contribution Diskeeper has made to HCA: "In IT we're taught to be reactive, but utilities like Diskeeper give us the ability to be proactive. IntelliWrite shows us our access times before and after defrags take place. This visually highlights the impact the tool has on our systems." Diskeeper technology is now deployed on roughly 40 of the virtual servers and 5 physical servers.

Jared lists his top priority as enabling end users through IT to provide the best possible patient

care, while at the same time organizing and streamlining IT back-end processes to ensure efficiency and increase availability of shared resources. "Our organization wouldn't be able to do what we do without IT. Diskeeper is the key to us building better systems and doing it right."

CMBA Architects

Based in Sioux City, Iowa, Cannon Moss Brygger & Associates is an architectural firm based in Sioux City, Iowa, providing multi-disciplinary expertise for a wide variety of building projects. Founded in Sioux City in 1963, the firm expanded during the mid-1980s to three offices - two in Iowa, one in Nebraska.

At CMBA the internal computer systems encompass branch offices, home-based users, and users at remote project sites. Applications on each of the branch offices' and home users' machines are maintained locally instead of through a central datacenter. In the past, the company's two-person IT department routinely found themselves remotely handling system maintenance such as resource-heavy critical applications that frequently crashed and couldn't be restarted, data loss requiring system rollbacks, and slow remote access times.

Dwight Baker, onsite system administrator at CMBA, saw defragmentation software as an opportunity to synchronize system maintenance across sites and eliminate system crashes and data loss. When he became the firm's onsite system administrator in 2006, CMBA was using Diskeeper Lite, the free, entry-level, manually run version of Diskeeper on local machines, but only at one site. He immediately convinced the firm owners that upgrading to the Diskeeper Pro Premier for all workstations at all three offices was in the company's best interest.

He explains, "Diskeeper's automatic *Set It and Forget It* ® function is a real time-saver, because the system is being continuously defragged" which eliminates the previous time cost of running a manual defrag and labor-intensive system rebuilding. After installing Diskeeper Pro Premier, issues with crashing applications and system performance stopped showing up in their IT troubleshooting list. The IT department was also able to stop using the version control rollback tool that had been a reactive method of responding to application and data damage.

Dwight sums up the improvements in CMBA's IT organization by saying, "We've found that the technology, and the Diskeeper 2010 product in general, is like a logical extension of our IT Team in that it maintains the user (and server) environment. "

Conclusions

Low overhead in system resources, significant documented potential improvements in performance and reliability, along with the improved user productivity and better IT resource utilization demonstrate beyond a doubt that Diskeeper software isn't just a "nice to have" option in your standard system configuration for the effective business IT department.It is a "must have" in order to obtain the best possible performance and ROI on your servers and workstations.

"It never gets in the way"

Users report that they are impressed by the way that Diskeeper operates quietly in the background yet maintains their equipment at an expected level of performance. Easy deployment, excellent management tools, and simple-to-configure features for maximum benefit were all commonly reported in our user survey. These are all features that IT looks for in the applications they choose and are an excellent description of the features of utility applications that should be found on every system.

"Reliability and improved performance are the primary benefits and deciding factors as to why we choose Diskeeper."

The benefits of improved hardware reliability and system performance are clear; longer system life, more effective information delivery, improved user productivity. These are far beyond the benefits commonly associated with disk defragmentation software and are the result of a comprehensive, deployment of Diskeeper.

"I wouldn't use Windows without it"

Many IT departments deploy Diskeeper as a standard part of the system configuration for both servers and workstations. Our survey shows that the benefits they have gained from this far exceed their expectations. With issues such as green IT and virtualization being so important to the future of business computing, core applications that improve the performance of your existing and future systems in those areas are an important component of business-focused IT.

Diskeeper corporation