U.S. District Court
District of Maine

Defragmentation Cures Sluggish Windows 2000 Servers at U.S. District Court Site

"The results we've obtained from Diskeeper compare favorably to what I've seen from major hardware upgrades," says senior automation manager Kevin Beaulieu. "Clearly, defragmenting regularly is vital to system performance."

Background: The Federal Court System Goes High Tech

In the American court system, whenever a dispute is with a citizen of another state or is governed by federal law, it is tried in a federal court, not in a state court. The United States district courts are the trial courts of the federal court system. Within limits set by Congress and the Constitution, the district courts have jurisdiction to hear nearly all categories of federal cases, including both civil and criminal matters. One of the two U.S. District Courts in the State of Maine that try these federal cases is located in the city of Portland.

The U.S. District Court in Portland uses modern technology to increase efficiency internally. It utilizes a network of Windows 2000 Servers. They have 2 GB RAM per server and a Dual Zeon 1 GHz CPU. They run RAID 1 (for the operating system) and have 52 GB online storage (RAID 5) for data. These servers operate as file and print, Web, Domain Controller, application servers and more. The application mix includes Microsoft® Exchange, WINS, DHCP, DNS, Veritas Backup Exec, WordPerfect, Net Show Server, IIS, Netscape Enterprise, Right Fax, SMS, as well as some court-specific applications to track restitution payments, jury monitoring, etc.

In addition to servicing the internal demands of the court system itself, the court also provides data online to lawyers and the public. Its Public Access to Court Electronic Records system (PACER) for example, offers case information to authorized users over the Internet. Public records, forms, court opinions and rulings are also available online. Therefore, the IT systems of this U.S. District Court must be kept running smoothly at all times.

Challenge: A Slow and Fragmented Legal System

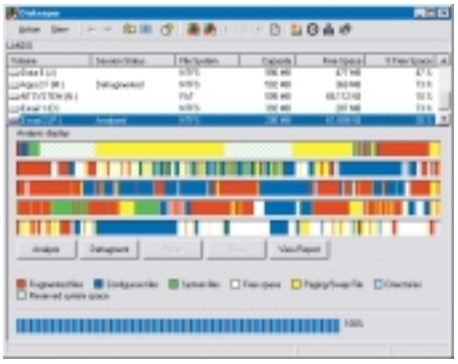
To maximize performance and support its growing network, the court added several new servers and migrated from Windows NT to Windows 2000. However, after an initial period of exceptional performance, even the newest servers became sluggish. Despite these hardware upgrades, many of the court's users began to voice complaints concerning the time it was taking to access their files. Directory listings and file access, for instance, were taking up to 10 seconds and even server response became sluggish.

"One server, for example, took 20 minutes to shut down during reboot," says senior automation manager Kevin Beaulieu. "System deterioration over time was just the 'reality' of the Windows world as far as we were concerned."

In addition to this a steady dwindling in performance on all servers, backups began to take longer than expected and on a number of occasions the system would hang in the middle of a scheduled backup. "It took a very long time for backups and the system was extremely slow," said Beaulieu. "We also experienced system hangs and other reliability problems." These needed to be addressed in order to obtain the system performance, reliability and ROI objectives the court originally set out to achieve with their hardware upgrade.

Disk Fragmentation

Disk fragmentation is inherent in the design of today's Windows-based environments. With hundreds of files being written and deleted from disks every minute of the working day, files are divided into fragments and rapidly scattered across the hard drive into whatever space is immediately available. However, while this system simplifies writing to a disk, it results in documents that can be divided into thousands of pieces. Unfortunately, for every thousand fragments, one thousand system I/Os are required to obtain access – the hidden reason behind long delays when opening files. Files were found splintered into so many pieces that some server operations took 25 times longer than normal.



Example of a typically fragmented partition.

The Solution: Picking up the Pieces

The U.S. District Court's solution was to install a third party network defragmenter on each of their servers and workstations. A network defragmentation program checks each file and partition to determine which files need to be defragmented and which should be moved to another location to provide more contigu-

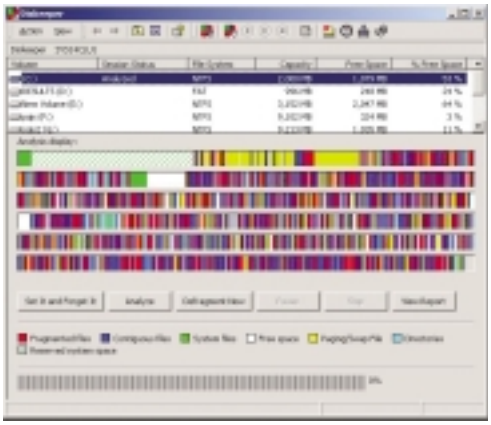
ous free space. To accomplish this online, so that defragmenting could occur seamlessly in the background while continuing to support the high demand for system access simultaneously, the U.S. District Court chose Diskeeper® by Executive Software.

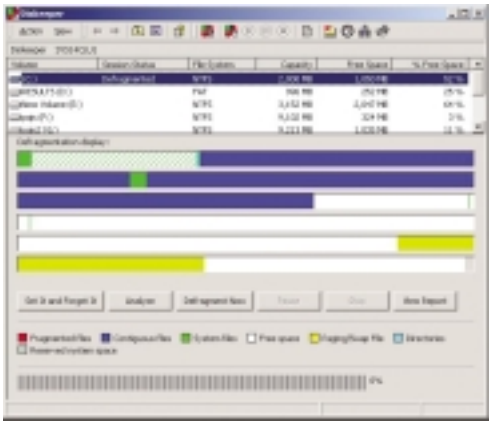
Diskeeper uses special APIs developed by Executive Software in cooperation with Microsoft. These APIs work with the file system, designed specifically to accomplish defragmentation safely. From his own desk, Beaulieu was able to utilize Diskeeper's PushInstaller™ feature to remotely load the defragmenter onto each server and workstation across the entire U.S. District Court site.

Diskeeper is a complete defragmentation solution requiring zero administration. It includes built-in "Set It and Forget It"® and "Smart Scheduling"® features to make defragmentation easy and seamless throughout the enterprise. Its breakthrough "Push Install" technology eliminates the significant yet hidden costs associated with manual software deployment. Diskeeper can be run on any Microsoft Windows NT®, Windows® XP, Windows 2000, Windows Me, Windows 98, Windows 95 systems, even in a mixed O/S environment.

BEFORE

Severely fragmented and neglected partition.





AFTER

Same partition that has been thoroughly defragmented.

Results: Significant Performance and System Reliability Gains

Despite the advanced state of fragmentation at the government site in Maine, the defragmentation program rapidly consolidated all servers and workstations. "The results gotten from Diskeeper compare favorably to what I've seen from major hardware upgrades," Beaulieu pointed out. "Clearly, defragmenting regularly is vital to system performance."

To maintain system performance, Beaulieu utilized Diskeeper's proprietary "Set It and Forget It" option, which automatically detects and handles defragmentation using a minimal amount of system overhead.

System Performance & Reliability

By defragmenting its entire network, a U.S. District Court site in Portland, Maine, has significantly accelerated performance and system reliability. One server, in particular, was laboring severely under a heavy fragmentation load. File access times were resulting in a constant stream of user complaints. "After initiating a routine defragmentation schedule, the time it took to for file access went from as much as 10 seconds to about a second," said Beaulieu.

Beaulieu also noted system reliability improvements across the network after defragmentation with Diskeeper. In addition to system hangs before defragmenting, several servers would take a very long time to reboot. In some cases, Windows servers would shut down completely due to fragmentation. "We occasionally experienced system hangs and these went away after we implemented a routine defragmentation schedule on all our machines," Beaulieu said. "The time it takes to boot a server has dropped from 20 minutes to 45 seconds," he added.

Back-Ups

After the migration to Windows 2000, the U.S. District Court site switched to Veritas Backup Exec. According to Beaulieu, the Open File agent used by this backup program makes a virtual copy of the drive and then backs up the virtual copy. Result: large quantities of temporary files are created and deleted in the process, creating extensive amounts of fragmentation.

"After the installation of Diskeeper, we saw an increase of backup speed of up to 30 percent," said Beaulieu. "Further, the system was usable during backups, which it never was before."

The Built-In vs Diskeeper

Beaulieu's advice to other system managers is simple: "The built-in defragmenter that comes with Windows 2000 is a waste of time as you have to use it manually on every box and that absorbs a lot of valuable time," said Beaulieu. "That defragmenter also fails to address system files like the Paging File and Master File Table, which can become a severe fragmentation problem on any Windows system. "My advice would be to implement network wide defragmentation, and taking advantage of Diskeeper's Set it and Forget it and Smart Scheduling features."

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