HOW DISKEEPER 2008 DEFRAGMENTS TRANSPARENTLY AND AUTOMATICALLY

By Howard Butler

Defragmentation software has long been a standard tool for enterprise servers. Now, an increasingly mobile workforce is demanding top performance and reliability from systems on the go. Diskeeper® 2008 software provides transparent, automatic disk defragmentation designed to boost productivity across the entire system spectrum, from the smallest laptop to the largest server.

Related Categories:

Diskeeper

Performance

Storage

Systems management

Visit DELL.COM/PowerSolutions for the complete category index.

The number of files stored on mobile laptops, workstations, servers, storage area network devices, and RAID arrays in enterprise IT environments is greater than ever. This growth not only necessitates ever-increasing storage capabilities, but also places a burden on file systems to keep files stored contiguously for fast user access. File fragmentation can seriously degrade performance—and is a growing concern for IT teams supporting busy mobile workers who may not have the time or the inclination to perform regular system maintenance.

Hard drives store files in chunks called clusters. Ideally, all of a file's clusters would be located adjacent to one other in a long, unbroken chain. Contiguous clusters enhance hard drive performance—the drive can read files quickly when the read/write heads do not need to move very far. In actuality, however, files are often stored in many thousands of clusters scattered across the drive. Such fragmentation is a natural occurrence—but can lead to a degradation in system performance that continues to erode as a disk becomes increasingly fragmented through ordinary file creation, deletion, and modification. Fragmentation cannot be avoided, but it can be controlled. Diskeeper 2008 software is designed to provide transparent, automatic disk defragmentation as it arises across the system spectrum—including on Dell™ Latitude™ laptops, Dell OptiPlex™ desktops, and Dell PowerEdge™ servers—without affecting performance or requiring scheduling by end users or IT administrators.

CONTROLLING FILE FRAGMENTATION

Common symptoms of fragmentation are well known to IT administrators, and include random disk failures, sluggish system boots, slow load times for documents, and excessively long backups and antivirus scans—the list goes on. But simply put, system performance can slow to a crawl if fragmentation continues unchecked. Defragmentation is essential to help reverse this performance degradation.

Defragmentation software has traditionally been mandatory on servers. But with the increase in laptops and docking bays in enterprise workplaces, information is also being stored locally by mobile users who demand top performance from their systems. Consequently, many large companies have begun equipping virtually every laptop, desktop, and server with defragmentation software to help ensure optimum performance and reliability. Defragmentation has even gained equal footing with antivirus software as a vital best practice. In a March 2008 research survey by Diskeeper Corporation, 179 system administrators were asked, "What software do you consider vital to have on your servers?" Of the respondents, 48 percent responded with "Antivirus/Symantec" and 45 percent responded with "Defrag/Diskeeper." Viruses and file fragmentation

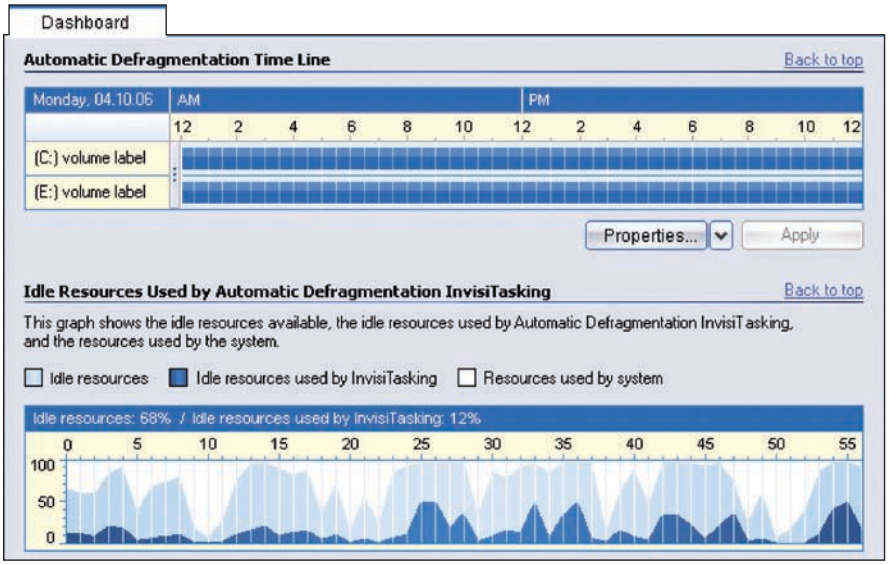

Figure 1. *Diskeeper 2008 with InvisiTasking monitors system resources to enable transparent defragmentation*

are now on par as key degradation problems for administrators.

COMPARING MANUAL AND AUTOMATIC DEFRAGMENTATION

In these environments of spiraling drive capacity and enormous file sizes, frequent defragmentation can be crucial to maintaining disk health and high performance levels. Infrequent manual defragmentation is typically both time-consuming and resource-intensive. Worse, many mobile users are unlikely to bother with it—incurring performance and reliability penalties from the daily increase in file fragmentation until the disk is defragmented.

Automatic defragmentation—enabled by default in Diskeeper 2008—helps avoid performance degradation by handling file fragmentation as it occurs. This approach minimizes defragmentation times and helps ensure maximum performance and reliability by avoiding fragmentation buildup.

UNDERSTANDING DISKEEPER INVISITASKING

Diskeeper InvisiTasking™ technology enables Diskeeper 2008 to run on the fly, with no intrusion on system resources. Because processor and I/O resources are almost never fully utilized, InvisiTasking can work transparently by tapping undetectably into unused system resources. It monitors resource consumption on a Microsoft® Windows® OS–based system—including processor, disk, memory, and network usage—and injects Diskeeper processing only into the unused portions (see Figure 1).

Software engineers sometimes attempt to share resources by choosing low processor priorities to run under, and some past efforts have been based on throttling disk and network I/O. Windows allocates processor resources using a hybrid of round-robin and priority-based preemptive scheduling. This approach can cause low-priority processes to unnecessarily preempt higher-priority processes, reducing their access to processor resources. InvisiTasking utilizes a technique designed to avoid using a processor time slice when higher-priority processes need to run.

InvisiTasking proactively tracks resource usage and network traffic while carefully managing memory usage and maintaining granular control over its own I/O. This approach represents an advance beyond low-priority I/O throttling because it is designed to address all system resource usage. For example, a low-priority I/O approach may still create contention for resources at the disk, and does not address other system resources. InvisiTasking checks resource usage to avoid contention before it begins processing. This proactive (rather than reactive) approach helps ensure that Diskeeper never preempts users or services and enables it to run imperceptibly in the background.

InvisiTasking is essentially a resource delegation framework that allows the OS to operate at high efficiency. It is designed to achieve comprehensive compatibility by allowing applications and services to operate under an additional layer of resource allocation. When operating in the InvisiTasking framework, even I/O-intensive processes can achieve transparency.

TRANSPARENT, AUTOMATIC DEFRAGMENTATION

Fragmentation affects all Windows-based systems. Organizations can opt to ignore the problem until a system crashes; suffer through time-consuming, resource-intensive manual defragmentation; or deploy automated defragmentation software that can handle fragmentation as it arises. Diskeeper 2008 with InvisiTasking technology is designed to work both transparently and automatically, working in real time when needed without intruding on system resources or requiring scheduling by end users or IT administrators. By helping prevent performance degradation buildup altogether, Diskeeper can help maintain a constant level of system performance and reliability.

Howard Butler is a senior technical engineer and the vice president of technical support for Diskeeper Corporation.

MORE ONLINE
DELL.COM/PowerSolutions

QUICK LINK

Diskeeper trialware and fragmentation analysis tools:
www.diskeeper.com