



Percept Technology Labs

PRODUCT TEST AND COMPLIANCE EXPERTS

Diskeeper 2008 EnterpriseServer Performance White Paper

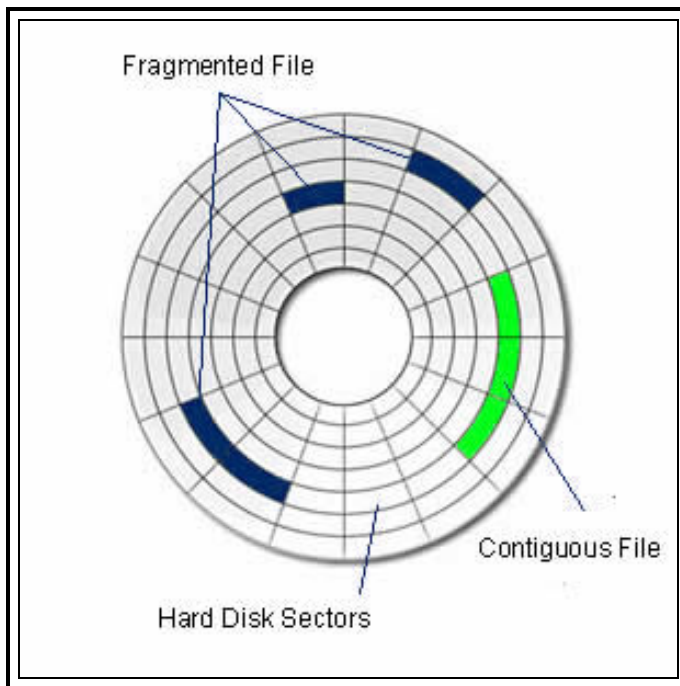
Based on Testing performed by:
Percept Technology Labs, Inc.,
An independent product test and consulting company



Introduction

File fragmentation. Most of us have heard of it, but few of us really understand what it means and how it impacts our system. All of our data is stored on a hard disk inside the system. Each time we create a new file, it is placed in a specific location on the hard disk. Modifying and deleting files contributes to fragmentation, in that the files get broken up and are placed in non-contiguous locations on the hard disk. Each time you open the file, the disk spins around, looking for each part of your file. The image below depicts a fragmented disk.

Figure 1: Fragmented Disk



Defragmenting hard drives usually falls to the person in charge of the network (especially when it comes to defragmenting network servers in enterprise environments). Many individuals still rely on Microsoft's native defragmentation tool in order to defragment hard drives. This tool is well-known for its voracious appetite for system resources, and is often run after-hours when the system is not in use.

Diskeeper Corporation has been developing defragmentation tools for over 25 years. The latest version of Diskeeper's defragmentation software, Diskeeper 2008, encompasses a new technology - InvisiTasking™. InvisiTasking allows for the defragmentation tool to use only the idle resources on a system and run in the background while not affecting system performance. If there are no free resources, InvisiTasking ceases running until resources are freed up. It runs in the background - a completely transparent process that keeps your computer free of fragmented files.

Percept Technology Labs, an independent product test and consulting company, ran several performance tests using Diskeeper's latest version of software for an enterprise server. The goal was to test whether Diskeeper performs as it claims - running in the background, only using idle resources, and not affecting system performance.

Performance Test

Configuration

The testing was performed on a Windows Server 2003 system with a dual core 2.8 GHz Intel Xeon processor and 2 GB RAM.

Diskeeper Corporation has released several versions of the Diskeeper 2008 including:

- Diskeeper 2008 Home
- Diskeeper 2008 Home Server
- Diskeeper 2008 Professional
- Diskeeper 2008 Pro Premier
- Diskeeper 2008 Server
- Diskeeper 2008 EnterpriseServer
- Diskeeper 2008 Administrator

The version Percept Technology Labs tested was Diskeeper 2008 EnterpriseServer Edition.

Objective

The main objective of the performance tests was to determine whether or not running Diskeeper in the background would adversely affect concurrently running foreground processes on the same system.

Percept used two tools to determine the effect of running Diskeeper, both of which are described below:

Utility Name	Description
Microsoft Jetstress	Jetstress is a pre-deployment Microsoft Exchange test utility. It verifies the performance and stability of the disk subsystem by simulating heavy loads to the disk, as if the server was being used by a large number of users. It is often used to test servers before they are put in a production environment to confirm that they can handle Microsoft Exchange, a disk-intensive application.
Microsoft SQL Server I/O Simulator (SQLIOSim)	SQLIOSim is a utility that simulates read patterns, write patterns, and the problem identification techniques of SQL server. To perform these tasks, the SQLIOSim utility simulates the user activity and the system activity of a SQL Server system. Its purpose is to determine if the hardware configuration is optimal for adding SQL Server to your system.

Both Jetstress and SQLIOSim require a high percentage of hard disk resources, leaving few idle resources for Diskeeper to utilize.

To monitor the amount of idle disk resources available to Diskeeper, Percept used Performance Monitor (Perfmon). Perfmon is a native Windows utility, used to track a range of processes on a Windows 2003 system.

Test Procedure

For both Jetstress and SQLIOSim, the following process was followed.

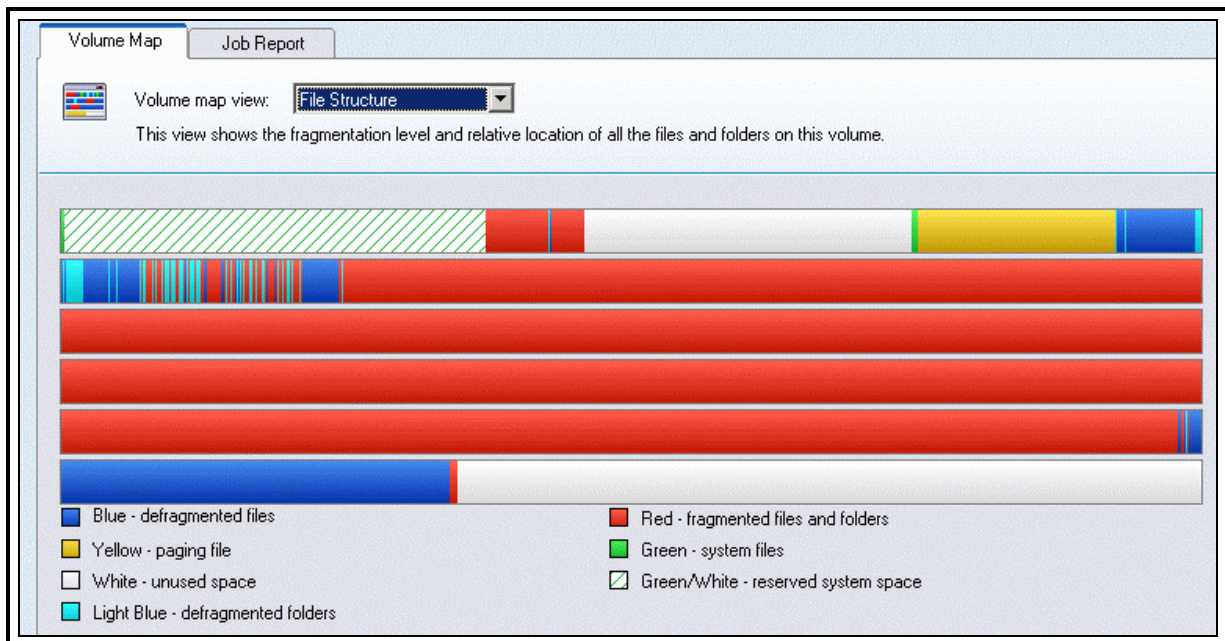
1. Load fresh operating system.
2. Image this fresh operating system to a second hard disk.
3. Run Jetstress on one hard disk repeatedly in order to fragment the disk. See Figure 2 below of the fragmented disk after running Jetstress.
4. Run SQLIOSim on the other hard disk repeatedly in order to fragment the disk.
5. Run Jetstress/SQLIOSim with Performance Monitor to baseline Jetstress/SQLIOSim resource usage.

NOTE: Jetstress is a 26-minute test. This is the typical duration of this software operation with the test configuration used and simulates a real-world environment.

NOTE: SQLIOSim is approximately a 30-minute test. This is the typical duration of this software operation with the test configuration used and simulates a real-world environment.

6. Run Jetstress/SQLIOSim, Perfmon and Diskeeper.
7. Compare the logs from steps 2 and 3.

Figure 2: File Fragmentation After Running Jetstress Utility



Test Results - Jetstress

Percept found that Diskeeper was able to defragment files while Jetstress was running even though Jetstress leaves only approximately 1% of disk resource for Diskeeper to perform its defragmentation.

After running Jetstress the first time (without Diskeeper), Diskeeper's analyze function found 699 fragmented files. Running Jetstress by itself a second time increased the number of fragmented files by six to 705. For the final iteration, both Jetstress and Diskeeper were run. Following that iteration, Diskeeper's analyze function recorded 702 fragmented files (rather than the projected 711). In 26 minutes and under extreme system pressure, Diskeeper was able to prevent any further fragmentations while fixing some of the existing fragmentations.

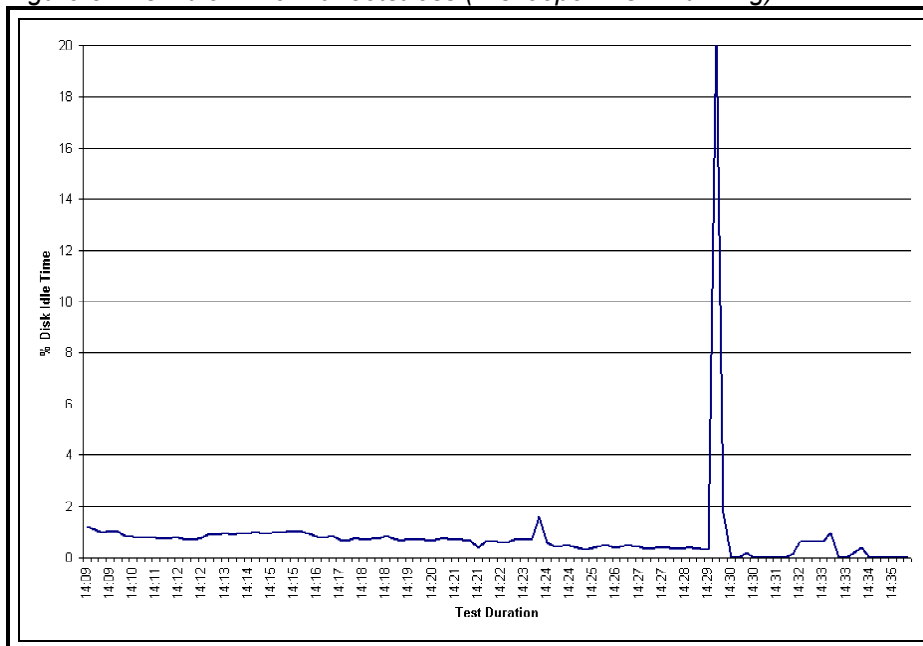
Fragmented Files During Each Jetstress Run

Jetstress Run #1 (alone):	699
Jetstress Run #2 (alone):	705
Jetstress Run #3 (with Diskeeper):	702*

*Projected 711 without Diskeeper running

The spike seen in Figure 3 below depicts an opportunity where Diskeeper has more resources to work with.

Figure 3: Disk Idle Time with Jetstress (Diskeeper NOT Running)



Regarding system performance, not only was no system performance degradation noted while running Jetstress streaming backup operations, but an increase of 2% in performance was achieved.

Test Results - SQLIOSim

The second main finding of Percept's testing was that Diskeeper was able to defragment files while SQLIOSim was running. SQLIOSim leaves even less system resources available than Jetstress does, approximately 0.3%. This utility is 66% harder on the hard disk than the Jetstress utility.

After running SQLIOSim the first time on the previously fragmented system (without Diskeeper running), Diskeeper's analyze function reported 92 fragmented files. Running SQLIOSim a second time resulted in Diskeeper's analyze function finding 97 fragmented files. For the next iteration, we ran both Diskeeper and SQLIOSim. This run brought the total number of fragmented files down to 87 (rather than the projected 102). Once again, not only did Diskeeper prevent any more files from fragmenting, but it was also able to defragment an additional 10 files that had been previously fragmented.

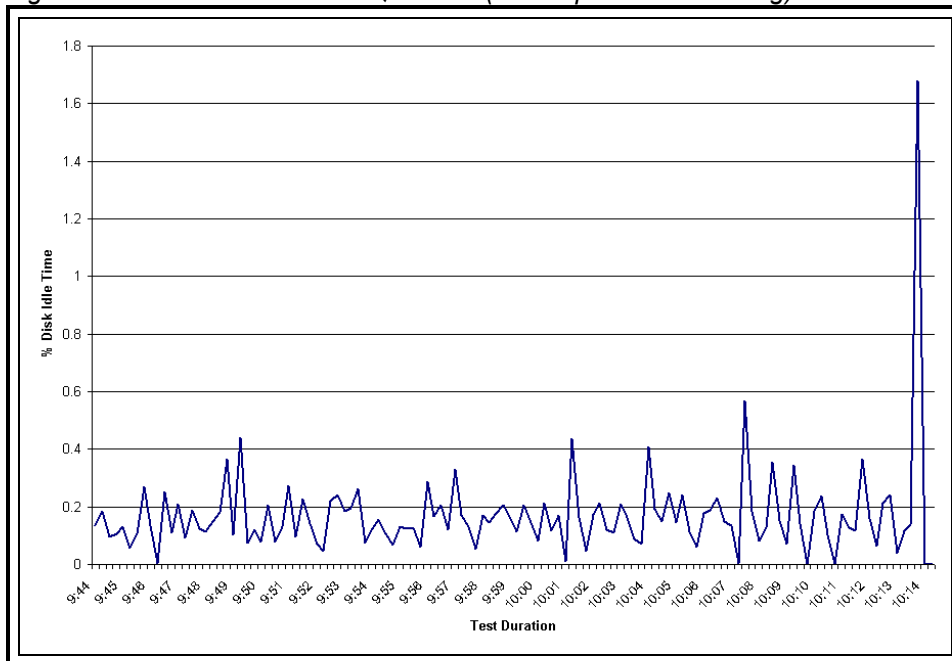
Fragmented Files During Each SQLIOSim Run

SQLIOSim Run #1 (alone)	92
SQLIOSim Run #2 (alone)	97
SQLIOSim Run #3 (with Diskeeper)	87*

**Projected 102 without Diskeeper running*

Again, a spike can be seen in Figure 4 below where Diskeeper has more resources to work with.

Figure 4: Disk Idle Time with SQLIOSim (Diskeeper NOT Running)



Conclusion

Disk fragmentation can cause a multitude of issues, including both stability and reliability problems. Diskeeper claims that running their software not only prevents system fragmentation, but due to their innovative InvisiTasking™ technology, does not affect system performance while running. This was found to be true, as demonstrated by Percept's Jetstress testing, where we experienced a 2% increase in performance.

Even in situations where disk resources are at a premium, Diskeeper is able to perform defragmentation while not affecting overall system performance. Both Jetstress and SQLIOSim testing iterations run in relatively small time frames, however even in these short intervals, a decrease in fragmentation was observed when running Diskeeper. With continuous use, the decrease in fragmentation will be much greater and performance will noticeably improve.

Percept's testing demonstrates that Diskeeper keeps its promise to maintain clean, defragmented hard drives while not affecting overall system performance.

About Percept Technology Labs

Percept Technology Labs, Inc. is an established, independent product test and consulting company with a proven track record of helping customers test and improve their products since 1996. To learn about Percept's full line of testing and consulting services, please visit www.percept.com or call 303-444-7480.