

Going “Green” with Diskeeper

(Abstract)

Overview

This three page abstract summarizes the hardware, methodology and results in performance, cost, time to complete, wattage consumed for each test and overall KWH consumption by using Diskeeper defragmentation software. All testing, including methodology, format, and protocols were performed by 3D Professor, with a focus of determining the power/cost savings Diskeeper affords to users.

Full details on procedure, configuration, and raw data is available in the white paper at <http://downloads.diskeeper.com/pdf/going-green-with-diskeeper.pdf>.

Methodology & System Configuration

Benchmarking consisted of simple before and after wattage calculations monitored on the system without, and then with Diskeeper. This provides “before and after” statistics used to formulate the conclusions.

Hardware

Measure Kilowatts per hour (KWH):

- Plug-in Mains Power & Energy Monitor (note: where wattage and kilowatts are measured, lower is better in all instances. (100 watts equals .1 kilowatt)
- Four thermal diodes used to ensure ambient room temperature of 22.5 °C (72.5 °F).

Test Platform:

- Akasa Zen Chassis
- Akasa Power80+ 500W Power Supply Unit
- Akasa 965 Heatsink Fan
- Intel Q9300 (2.5GHz) Quad Core CPU
- Intel X38 Bonetrail Mainboard
- 4 X 1GB Crucial DDR3 Ballistix PC3-12800, Memory Modules
- AMD FireGL V5600 (Current Driver Release 8.453.1)
- Plextor SATA DVDRW+ PX-760A (Designated Drive D)
- Akasa 120mm Intake Fan
- Akasa 120mm Exhaust Fan
- Western Digital Caviar® GP 500GB IntelliPower Hard Disk, SATA 3 GB/s, 8MB Cache. (Boot Disc Designated Drive C)
- Western Digital Caviar® GP 1TB IntelliPower Hard Disk, SATA 3 GB/s, 16MB Cache. (Data Disc Designated Drive E)

Uninterrupted Power Supply (UPS):

- APC Back-UPS ES 700

Software

Operating System:

Microsoft Windows XP Professional SP3 Platform (with all updates)

Application Software used to test power consumption:

- SPECviewperf 10®
- HD Tach Version 3.0.4.0
- SiSoftware Sandra XII SP1

- MAXON CINEBENCH 10
- Autodesk 3ds Max 9 SP2
- SPECapc for 3ds Max™ 9
- SPECapc for SolidWorks 2007™

Defragmentation Software:

- Diskeeper® Pro Premier Edition w/InvisiTasking (used to eliminate fragmentation for comparisons tests)
 - Light/mild file fragmentation was naturally created through installation and use of above listed software. Typically about 7000-8000 total excess file fragments.

Conclusions

The positive impact Diskeeper has throughout the various test demonstrates its full potential for energy savings in precious KWH's. A brief summary of the results from the tests show:

Test Application/Procedure	Diskeeper not Installed	Diskeeper Installed
SPECviewperf 10@ Complete run_all		☑
HD Tach Version 3.0.4.0 Average Read Test		☑
HD Tach Version 3.0.4.0 Burst Speed Test		☑
Cinebench 10		☑
SiSoftware Sandra XII Processor System Test		☑
SiSoftware Sandra XII Multimedia System Test		☑
SiSoftware Sandra XII File System Test		☑
SiSoftware Sandra XII Physical Disc Test		☑
Autodesk 3ds Max 9 SP2 Scenes		☑
SPECapc for SolidWorks 2007™		☑
System Volume Back-Up (Initial Test)		☑
System Volume Back-Up (12 Day work cycle completed)		☑

☑ = Used Less Energy and Faster Results

While all the tests showed positive savings, perhaps the best power-friendly results were with the Radiosity tests, which are designed to stress the whole system (Hard Disc, Memory and CPU) to perform to their maximum.

One of the biggest known issues today is that of system back-up. IT professionals know just how long and frustrating a task this can be, especially when backing up many systems simultaneously. The simple testing presented demonstrates the effectiveness of Diskeeper and I-FAAST technology at its best. The implementation of Diskeeper with I-FAAST technology saw both Back-Up times reduced and subsequent energy savings.

The total aggregate time for all tests, renders, and benchmarks covered within this paper was 9 Hours and 21 minutes and required 0.97 KWH's of power when Diskeeper was not installed. Compare this to a far faster total of 7 Hours and 40 minutes to complete, with only 0.85 KWH's of power consumed when Diskeeper was implemented. That accounts for saving of 1 hours 41 minutes of time.

It also accounts for 0.12 KWH's of energy savings in a given day, or about 12.4% per computer. While this may appear minimal on a granular scale, it amounts to considerable energy savings when extended over the course of a full year. Assuming average cost of US Commercial KWH at \$0.11083, that is a savings of \$3.22 per PC. Calculating these power savings to a medium sized company with 250 workstations we see an approximate annual savings of \$804.414. This also takes in to consideration that the PCs are powered off/down during non-production hours (overnight/lunch).

While the average PC in business use may not be exercised so heavily, it is almost certain to have a higher degree of fragmentation than in these tests. With high powered computers easily reaching fragmentation levels 10 times higher we believe the power savings calculations will be quite accurate to extend across corporate computers.

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