Hard Drives Essay, Research Paper

Hard Drives In this day and age of faster computers and high-speed processors,

it should only stand to reason that hard drives meet the same requirements as

the rest of the computer technology world. A technological look and some tips on

maintaining or troubleshooting hard drives is included below. By keeping up with

the standard of needs of the industry we can be assured that our personal

computers will have all the necessary space and the ability to access and save

the data as required and in an efficient manner. The new DiamondMax? Plus 40

series from Maxtor can unleash your computer power with advanced technology and

performance. Available in capacities up to 40 GB, these 7,200 RPM drives include

Maxtor’s unique DualWave? twin processor technology for a 10x boost in host

command processing speed. Coupled with 2 MB of high speed 100 MHz SDRAM for the

cache buffer and an UltraDMA 66 interface, give our DualWave-equipped hard

drives superior benchmark performance and maximum throughput. As a result,

they’re an ideal choice for consumers working with large files, including audio

and video applications. No matter how demanding your application, the new

DiamondMax Plus 40 series delivers the ultimate in performance and capacity.

With the popularity of multimedia, Internet and audio/video applications, more

performance is demanded from desktop PC systems than ever before. System vendors

are looking at all sub-components, including hard drives, as critical elements

in increasing system speed and performance. As we go forward every part of the

system will be called upon to improve throughput. The hard drive is a critical

element in system performance, influencing how fast windows or Mac OS boots, how

quickly applications launch, and the speed of loading large data or graphics

files. Any operation that involves moving large amounts of information on or off

the disk will reveal the importance of a high-performance hard drive. Many top

PC manufacturers are expanding the use of 7200 RPM drives across all platforms

and market segments. The performance achieved by 7200 RPM IDE drives also have

made these drives a viable alternative to SCSI in traditional SCSI applications

such as server and entry-level RAID. According to analysts at IDC, total

worldwide shipments of 7200 RPM IDE drives is expected to be 16% of all IDE

drives by the end of this year. This number is expected to be approximately 75%

by the year 2002. The newly introduced DiamondMax? Plus 40 hard drives feature

a 7200 RPM rotational speed along with other performance-enhancing features that

generate faster overall system response times and performance. A Viable

Alternative to SCSI,IDE 7200 RPM drives have made their way into the

storage-intensive environment of graphic and video applications. The ability to

achieve fast-sustained throughput is essential in high-end graphics and digital

video content creation. 7200 RPM drives establish a new price/performance ratio

in the professional graphic and digital video marketplace when compared to the

SCSI alternative. Maxtor’s 7200 RPM IDE drives incorporate a larger buffer to

provide high-sustained data transfer rates that are important when working with

large files such as multimedia and video. Maxtor is a leader in caching

technology, employing sophisticated algorithms similar to those found in

high-end SCSI drives. Maxtor’s drives feature a 2 MB cache buffer incorporating

a high-speed 100 MHz SDRAM memory, the same sort of memory found on today’s high

performance systems. Maxtor’s 7200 RPM drives were the first IDE drives to be

featured in a RAID level 5 configuration in an uncompressed nonlinear video

editing system. The drive’s high storage capacity, reliability and performance

are well suited for this application. RAID level 5 provides protection against

drive failures because in the event of a failure, the drive can be replaced

without loss of data. This is especially critical in the video editing process,

where 1 GB of storage typically holds approximately 1 minute of uncompressed

video. The new DiamondMax Plus 40 drives include Maxtor’s MaxSafe and ShockBlock

reliability feature set for added protection against surface scan errors and

shock and handling damage. This reliability set, when incorporated into a RAID

level 5 configuration provides users in this market with unsurpassed protection

against drive failures and potential loss from expensive downtime and data loss.

The editorial community is taking notice of the SCSI-level performance that is

achieved by today’s 7200 RPM IDE drives. In a recent product evaluation of

Maxtor’s 7200 RPM drive published at Winmag.com, the reviewers tested the

drive’s performance using an internally-developed benchmark. The results were

impressive. In the copy test, the drive copied at 3.29 MB/sec., surpassing the

results of a competitive SCSI-2 LVD drive. Maxtor’s DiamondMax Plus 7200 RPM IDE

drives are approximately 25% faster on copy speed than a competing SCSI drive!

7200 RPM Drives Improve Overall System Performance High-performance drives

improve performance in several ways. The first is evident in the WinBench

measurement, a popular means of evaluating system performance. In WinBench, a

variety of popular applications are simulated and overall execution time

measured. A weighting factor is applied to the execution time for each

application package. Measurements have shown that 7200 RPM drives improve

WinBench scores approximately 20% over equivalent capacity 5400 RPM drives.

Considering that WinBench is a measure of overall system throughput, as opposed

to just drive throughput, this is an impressive result. Random throughput,

especially important in database or server applications, is largely determined

by seek time and rotational speed. In its roughest terms, random throughput, in

operations per second, is the speed of processing a string of mall transfer

commands where the data locations are randomly distributed over the disk.

Maxtor’s new 7200 RPM rotational speed drive reduces rotational latency by 25%

relative to 5400 RPM drives. This results in a substantial improvement in the

drive’s random throughput. Sequential throughput, critical in graphics, video

and entertainment applications, is ultimately determined by the drive’s internal

data rate or the rate at which the recording head transfers data to and from the

disk. The factor that determines sustained throughput, the internal data rate,

is indirectly determined by the drive’s rotational rate. Simply stated, a

faster-spinning drive will tend to read data from the disk faster. If two

drives, one 5400 and one 7200 RPM have the same capacity and the same number of

disks; the 7200 RPM drive will read the same amount of data in a shorter period.

Files therefore load faster, the OS boots in less time, and the computer

responds more quickly. The insatiable need for performance in high-end computing

systems and workstations requires new technologies and architectures in order to

meet the demand. Maxtor’s new DiamondMax Plus 40 incorporates a host of features

to provide an increase in overall system performance and responsiveness. The

DiamondMax 40 includes: 7200 RPM rotational speed; Capacities ranging from 10.2

GB to 40.9 GB; 2 MB cache buffer; DualWave controller; MaxSafe media scan;

ShockBlock mechanics; UltraDMA 66. General information and troubleshooting your

hard drive: The amount of space available to store information on hard drives is

constantly increasing. Computer operating systems and system BIOS have

limitations that are related to specific hard drive capacities. Three capacity

points that can affect how your operating system and system BIOS support your

hard drive are 8.4 GB, 2.1 GB, and 528 MB. There are several PC components that

have an EIDE drive capacity limitation at approximately 8.4 GB. The BIOS

limitations at the 2.1 GB and 528 MB capacity barriers do not occur in newer

systems. They are addressed here solely for the benefit of those who may be

experiencing issues with an older system. There is an 8.4 GB hard drive

limitation on some traditional system BIOS. The following is required to access

the full capacity of an 8.4 GB or larger hard drive: A system BIOS that supports

extended functions An operating system that recognizes extended BIOS functions

Operating systems that recognize extended BIOS functions: Windows 95 Windows 98

Operating systems that do not recognize extended BIOS functions: DOS 6.xx and

earlier Windows 3.1x Windows NT (See note in table below.) Novell NetWare OS/2

Warp (See note in table below.) Operating System Limitation DOS 6.xx and

earlier, Windows 3.1x, Windows NT 4.0, 3.x, and earlier, Novell NetWare– 8.4 GB

maximum capacity limit. Hard drive capacities larger than 8.4 GB are recognized

as 8.4 GB. Note: Windows NT 4.0 with Service Pack 3 recognizes hard drive

capacities larger than 8.4 GB. OS/2 Warp– Note: OS/2 Warp has a driver update

available, which should support hard drive capacities larger than 8.4 GB. See

IBM’s OS/2 Device Driver Pak on-line for more details. The limitations of your

system BIOS and your operating system combined determine your overall system

limitation. For example, if your operating system recognizes extended BIOS

functions, but your system BIOS has a 2.1 GB drive barrier, you are limited to

your system BIOS’s 2.1 GB drive barrier. Conversely, if your operating system

does not recognize extended BIOS functions, but your system BIOS supports 8.4 GB

hard drives, you are limited to your operating system’s capability. Your system

limitation is based on the lowest functioning barrier. Since it is difficult to

determine if your system BIOS supports 8.4 GB or larger hard drives, we

recommend using EZ-Drive 9.06W or later. EZ-Drive 9.06W or later determines

whether or not your system BIOS provides extended BIOS support. If it does not,

EZ-Drive installs EZ-BIOS on the boot sector of the hard drive to support the

full capacity of your 8.4 GB or larger hard drive. If your system supports

extended BIOS functions, EZ-Drive does not install EZ-BIOS. EZ-Drive software

can be downloaded here. If you do not use EZ-Drive, another option is to upgrade

your system BIOS. A properly upgraded system BIOS will support the full capacity

of your hard drive if used with an operating system that recognizes extended

BIOS functions. Contact your system manufacturer for more information. Hard

drives larger than 2.1 GB have more than 4095 cylinders. Some computer systems

built before early 1996 do not support hard drives with more than 4095 cylinders

(hard drives larger than 2.1 GB), unless you update the system BIOS, install an

EIDE controller card with onboard BIOS, or install third-party software such as

EZ-Drive. You will know if your system BIOS has this limitation after installing

your drive if: Your operating system shows a much smaller drive capacity than

the actual drive capacity. Your system locks up on initial boot, preventing you

from accessing CMOS setup. If your operating system shows a much smaller drive

capacity, use EZ-Drive to overcome the 2.1 GB BIOS limitation. Your System Locks

Up on Initial Boot. If you cannot access the CMOS setup because your system

locks up on initial boot, follow these instructions: 1. Turn off your system

power, check the IDE interface cable and power supply cable. 2. Check jumper

settings. 3. Turn on your system power. 4. Try to enter your CMOS setup and set

the drive type to auto config. If your system still does not respond, your

system BIOS may not support drives with more than 4095 cylinders. If this is the

case, consider these solutions: 1. Use EZ-Drive installation software. If the

system locks up and prevents entry to CMOS, you must turn off your system power

and disconnect the IDE interface cable from the system. – Enter your CMOS setup.

- Select the Hard Disk Type option for your new Western Digital hard drive. -

Select a user defined drive type and enter: 1023 cylinders, 16 heads, and 63

sectors. If your system does not have a user defined drive type, select Type 9.

- Reconnect your IDE interface cable to the system. – Use EZ-Drive installation

software. These new settings allow your system to boot so that you can install

EZ-Drive to access the full capacity of your drive. – OR- If you do not have a

user defined or Type9 drive type, use option 2, 3, or 4 below to change the

parameters reported to the BIOS. 2. Upgrade your system BIOS A properly upgraded

system BIOS will support the full capacity of your hard drive. Contact your

system manufacturer. 3. Install an EIDE controller card with an onboard BIOS

that supports hard drives larger than 2.1 GB. For 8.4 GB or larger hard drives,

the EIDE controller card must support extended BIOS functions. 4. Rejumper the

drive using alternate jumper set-tings and install EZ-Drive. With these

alternate jumper settings, you MUST install EZ-Drive. Most computer systems

built before August 1994 do not support hard drives larger than 528 MB, unless

you update the system BIOS, install an EIDE controller card with onboard BIOS,

or install third-party software such as EZ-Drive. To determine if your system

supports drives with a capacity larger than 528 MB, we suggest the following: 1.

Enter your CMOS setup, look for options such as "LBA", "Large

Disk Access", or "Translation," and enable these options. 2.

Frequently, but not always, you must select an auto config drive type. If you

see a value greater than 16 heads, you probably have translating BIOS. 3.

Contact your system or BIOS manufacturer and verify that your system recognizes

drive capacities over 528 MB. In conclusion it has been shown that indeed hard

drive specifications and technology is keeping up with the rest of the

technology world. Advances in throughput and access speeds, coupled with large

amounts of space, have made the personal computer much more efficient and

effective for the average and the serious user.

‘The Expanding Frontier for 7200 RPM Drives’, www.maxtor.com/techdocs/dm\_p40wp.htm,

February 14, 2000. ‘Hard Drive Capacity Hard Drive Barriers’,

www.westerndigital.com/products/drives/8-4barr.html, December 02, 1999.