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Western Digital Glossary of Terms

A

access	Retrieval of data from or transfer of data into a storage device or area such as RAM or a register.
access time	The amount of time, including seek time, latency and controller time, needed for a storage device to retrieve information.
acoustics	A function of both energy input into a device and the device's ability to translate that energy into sound. Reducing acoustic emissions to the greatest degree possible results in a quieter hard drive. <i>See also</i> airborne acoustics and structure-borne acoustics .
active partition	The partition of the drive that contains the operating system. If the drive has multiple partitions, only the primary partition can be made active. A hard drive can have only one active partition.
Active Power Save™	Drive feature that delivers seek mode power consumption through an advanced WD firmware which conserves power in active seek modes without degrading performance.
active termination	One or more voltage regulators that produce termination voltage. The voltage regulator(s) drives a constant voltage along the bus to ensure that the data signal remains constant and strong over the entire length of the bus. The result is increased data integrity and reliability.
actuator	A mechanical assembly that positions the read/write head over the appropriate track.
actuator arm	The part of the actuator assembly that includes the positioning arm and the read/write heads.
adapter	Adapters (also known as expansion boards) are designed to operate with a Local Bus and fit into PCI (Peripheral Component Interconnect) slots on PCs.
adaptive cache	A feature of WD drives that enables improved performance and throughput by adapting to the application being executed.
address	In the hard drive industry, there are several types of addresses; an address may refer to that of a drive, called a unit address; radial position, called a cylinder address; or circumferential position, referred to as a sector address.
administrator	Person responsible for maintenance of the hardware and software comprising a computer network.
AES	Advanced Encryption Standard. 128-bit encryption technology used in WD Sync software.

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AFR	Annualized failure rate. A method of measuring failure rates or trends for a group of units at a site. The rates are based on the monthly total number of returned field failure units divided by the total cumulative installed base and multiplied by 12 (to annualize the failure rate).
airborne acoustics	The sound power level of a hard drive is measured in a sound chamber, where the drive is suspended and untouched by other objects. In this state, the hard drive emits airborne acoustics that are not necessarily indicative of the acoustics emitted by a drive mounted in a digital device.
allocation	The method DOS uses to assign a specific area of the hard drive to a given file. <i>See also</i> cluster .
ANSI	American National Standards Institute. A U.S. governmental body responsible for approving U.S. standards in many areas, including computers and communications. ANSI is a member of the International Standards Organization (ISO).
arbitrated loop	Fibre Channel (FC) topology where two or more ports can interconnect but only two ports can communicate at the same time.
arbitration	The act of determining which command, device, or communication protocol controls the operating environment.
areal density	The number of bits of data that can be recorded onto the surface of a disk or platter usually measured in square inches. The areal density is calculated by multiplying the bit density BPI by Tracks Per Inch (TPI).
ASP	Average selling price
asynchronous transmission	Transmission in which each byte of information is synchronized individually by using request (REQ) and acknowledge (ACK) signals.
ATA	Advanced Technology Attachment. Name used by ANSI to describe what the computer industry calls IDE.
auto defect retirement	The automatic mapping out and relocation of defective sectors found during read or write operations.
auto park	Moving read/write heads to a safe non-data landing zone and locking them into place, caused by turning off power to the drive.
AV	Audio/video
average access time	The average time a drive requires to perform a seek operation, usually measured by one-third stroke.
average seek time	The average time a drive requires to move read/write heads to a safe non-data landing zone and lock them in place.

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B

backplane	Large circuit board or assembly that contains sockets with connectors for easy insertion and removal of hard drives.
backup	The action of copying files from a primary medium (such as an internal hard drive) to a secondary medium (such as an external hard drive) in case of primary medium failure. The term backup also refers to a type of fixed media such as a hard drive that contains a data set copied from another source.
backward compatible	Term that refers to the compatibility of a (usually newer) device or program with files and data created with a previous version of the same device or program.
bandwidth	The amount of data that can be sent over a circuit. <i>See also</i> buffer bandwidth .
BIOS	Basic Input/Output System. A program or set of programs that control basic computer functions.
binary	Having two components or alternatives. Binary numbers are expressed as combinations of two digits, 0 and 1.
bit	An abbreviation for a binary digit which can be either 0 or 1. A bit is the basic data unit of all digital computers. It is usually part of a data byte, or data Word; however, a single bit can be used to control or read logic ON/OFF functions. Eight bits equal one byte.
bit density	The number of bits that can be written onto one inch of track on a disk surface, expressed as bits per inch (BPI).
block	A group of bytes handled, stored, and accessed as a logical data unit, such as an individual file record. A block in UNIX workstation environments is the smallest contiguous area that can be allocated for the storage of data. Note: A different definition of the term is used when referring to the physical configuration of a hard drive.
boot	To start or restart a computer, which loads the operating system.
BPI	Bits per Inch. A measurement of the density of information on a hard drive. <i>See also</i> bit density .
buffer	A temporary data storage area to allow for a different rates of data transfer and/or processing between sender and receiver. For example, a printer buffer accepts data from a computer and holds it until ready to print.
buffer bandwidth	The speed of transferring data to or from the buffer.
build-to-order	The assembly of a computer system in response to a customer order, rather than for inventory or mass shipment. A system used by Dell and Gateway, now being emulated to some degree by other PC manufacturers such as IBM, HP, and Compaq.

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burst mode transfer rate

The transfer rate into the buffer RAM of the hard drive. This rate does not factor in delays due to latencies or host delays. *See also* [transfer rate](#).

bus

The path that carries data between a computer (microprocessor) and peripheral devices. A Serial ATA (SATA) interface cable and a SCSI cable are both examples of a bus.

byte

A sequence of eight binary digits or bits regarded as a unit or binary word. The storage capacity of a hard drive is commonly measured in megabytes, which is the total number of storable bits divided by eight million.

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C

cache	High-speed RAM used as a buffer between the CPU and a hard drive. The cache retains recently accessed information to speed up subsequent accesses to the same data. When data is read from or written to the disk, a copy is saved in the cache, along with the associated disk address. The cache monitors the addresses of subsequent read operations to see if the required data is already in the cache. If it is, the drive returns the data immediately. If it is not in the cache, then it is fetched from the disk and saved in the cache.
cache buffer	See cache .
capacity	Also known as storage capacity. The amount of information, measured in bytes, that can be stored on a hard drive. WD defines a megabyte (MB) as 1,000,000 bytes and a gigabyte (GB) as 1,000,000,000 bytes. Some operating systems use the binary numbering system which results in a lower reported capacity.
CCC	Customer configuration code. A firmware revision tracking code that defines a major product change. This number increments as form, fit, or function changes are implemented. The CCC code guarantees that the correct revision of drive product is provided to the customer.
channel	A connection or socket on the motherboard or controller card. A motherboard may have one or two channels (primary and secondary). If your motherboard has only one channel, you may need to add a controller card to create a secondary channel.
channel assembly	The final assembly of a system by a distributor or reseller, from kits provided by a manufacturer and components shipped directly to the assembler by subsystem makers.
CHS addressing	Cylinder, head, sector addressing. A method of referencing drive sectors as a collection of unique cylinder, head, and sector addresses. Each block on a drive has a unique CHS address.
CIFS	Common Internet File System.
clamshell	A hinged, bifolded encasement. Packaging in which product is sold.
clean room	An environmentally-controlled, dust-free assembly or repair facility in which hard drives are assembled or opened for internal servicing.
cluster	An allocation unit. At least one cluster is allocated to each file, regardless of the file's size, that is stored in the DOS environment. The cluster size increases with the partition size determined during formatting. With a 1024 MB partition, the cluster size is 32 KB. Each file stored consumes 32 KB of storage space, no matter how small the file. To avoid wasting space on small files, create multiple, smaller partitions.
CMOS setup	A program supplied in most systems that allows you to configure internal and external devices.
cold swap	Act of swapping out a hard drive with the system powered off.

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- command aging** A SCSI feature that prevents the command reordering algorithm from keeping I/O processes waiting in the command queue for extended periods of time.
- command queuing** A technology designed to increase performance of SATA hard drives by allowing disk firmware to optimize the order in which read and write commands are executed. This may result in increased performance for workloads where multiple simultaneous read/write requests are outstanding, a situation that typically occurs in server-type applications. Normal desktop applications benefit less from command queuing and, in some cases, performance may be reduced due to added overhead.
- command reordering** A feature that allows the drive to reorder I/O processes in the command queue, which results in minimal seek time and rotational latency, and increased throughput.
- controller** *See also* [disk controller](#) and [interface controller](#).
- controller card** An adapter with the control electronics for one or more hard drives. Usually installed in a bus slot in the computer.
- correctable error** An error that the drive can correct by using error detection and correction schemes.
- CPU** Central processing unit. The CPU is the “brains” of the computer; the place where most calculations take place. In terms of computing power, the CPU is the most important element of a computer system.
- CRC** Cyclic redundancy check. A value stored or transmitted with data to detect corruption. By calculating a CRC and comparing it to the original data sent, a receiver can detect some types of transmission errors.
- CSEL** An alternative to Master/Slave designation in a dual-drive configuration. Master/Slave designation is based on the position of drives relative to the cable. Special cabling from a system manufacturer is required to ground the CSEL signal selectively on one IDE cable connector. For example, when one drive is connected to the grounded CSEL conductor, it configures itself as Master; the second drive connected to the other connector, on which CSEL is not grounded, becomes the Slave. CSEL eliminates the need for unique jumper configurations between Master and Slave drives.
- cylinder** The cylindrical surface formed by identical track numbers on vertically stacked disks.

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D

Data Lifeguard Tools™	A set of software utilities that work in conjunction with embedded Data Lifeguard features to make hard drive installation, drive management diagnostics, and repair simple and worry-free.
Data Lifeguard™	A WD-exclusive data reliability feature that automatically detects, isolates, and repairs problem areas on a hard drive and prevents data loss.
database	A collection of data stored on a computer system medium, such as a hard drive, CD-ROM, etc., that can be used for more than one purpose.
data synchronizer	An electronic circuit that uses a clock signal to synchronize data.
data transfer rate	The rate that digital data transfers from one point to another, expressed in bits per second or bytes per second. Data transfer rate to disk (internal disk transfer rate) is expressed in megabits per second (Mb/s). Data transfer rate from buffer to host (transfer of buffered data) is expressed in megabytes per second (MB/s).
dedicated landing zone	The designated radial zone of the disk, usually at the inner portion of the disk, where the heads are stored to avoid contact with the data cylinders when power to the drive is off.
defect-free	A term used to describe a recording surface that has no detectable defects.
defect management	A general method of eliminating data errors on a recording surface by mapping out known media defects. Defective areas are rendered inaccessible, so that subsequent operations write data only to non-defective locations.
desktop	A personal computer sized to fit on or under a desktop. WD internal hard drives are designed to fit into a desktop PC.
DHCP	Dynamic host configuration protocol. A protocol for assigning IP addresses to devices on a network. With dynamic addressing, a device can have a different IP address each time it connects to the network. In some systems, the device's IP address even changes while it is still connected. DHCP also supports a mix of static and dynamic IP addresses.
differential SCSI	An electrical signal configuration that uses pairs of lines for data transfer, primarily in applications requiring cable lengths up to 82 feet (25 meters).
disk	A rigid platter, usually constructed of aluminum or Mylar®, with a magnetic surface that allows the recording of data.
disk controller	A chip or circuit that controls the transfer of data between the hard drive and buffer. <i>See also</i> disk drive controller and interface controller .

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disk drive controller	Hard drive controller electronics, which include the disk controller and interface controller. <i>See also</i> disk controller and interface controller .
disk transfer rate	Speed at which data is transferred to/from disk (platter); a function of the recording frequency. Typical units are bits per second (b/s), or bytes per second (B/s). A hard drive disk transfer rate increases from the inner diameter to the outer diameter of the disk.
distribution channel	Electronics distributors and retail chains that deliver electronic goods to end users through value-added resellers and retail stores.
DLNA	Digital Living Network Alliance. The group of consumer electronics, computing industry, and mobile device companies that sets standards for product compatibility, thus enabling users to share content in their home.
DMA	Digital Media Adapter. A device that gives home entertainment devices the ability to transfer media such as music, photos, and videos to and from other devices over the network.
DMA	Direct memory access. A process for transferring data directly to and from main memory, without passing through the CPU. DMA improves speed and efficiency by allowing the system to continue CPU processing even while it is transferring data to/from the hard drive.
DNS	Domain Name Service. A system that allows a network name server to translate text host names into numeric IP addresses used to uniquely identify any device connected to the Internet.
DOS	Disk Operating System. A 16-bit operating system developed by Microsoft that was formerly the standard operating system for IBM-compatible PCs. DOS does not support multiple users or multitasking.
DPP	Data Path Protection. A feature that prevents possible electronic failures by preventing corruption of data on the hard drive.
DSA	Dual Stage Actuator. DSA is an improvement to the overall capability of the Servo system. It provides a mechanical benefit to improve the response time (higher bandwidth capability) of moving and maintaining the head position over the media.
dual interface	An external storage device with two interfaces available for connection to the computer.
dual-option backup	The ability to back up a drive either manually (on demand) or automatically.
DuraStep Ramp™	WD technology that locks the heads of a data disk to provide additional shock protection.
duty cycle	The time a component, device, or system is actually operating as compared to the time it is powered on; can be expressed as a ratio or percentage.
DVR	Digital video recorder.

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E

EasyLink™	A WD utility that allows users to locate and set up a drive as a local drive from any computer quickly and easily.
ECC	Error correction code. A mathematical algorithm that detects and corrects data errors.
ECC on the fly	A hardware correction technique that corrects errors in the read buffer prior to host transfer without any performance penalties. These error corrections are invisible to the host system because they do not require assistance from drive firmware.
EIDE	Enhanced Integrated Drive Electronics. <i>See</i> PATA .
EESA	Enterprise extensions S.M.A.R.T. accessed. An expanded command set that provides SCSI-like control for server environments, optimizing operation and performance when drives are used in vibration-prone multidrive systems such as rack-mounted servers.
embedded servo control	A design that generates accurate feedback to the head position servo system without requiring a full data surface, because servo control data is stored on every surface (unlike dedicated servo control).
encoding	Process of modifying data patterns prior to writing them on the disk surface.
enterprise	Series of computers employed largely in high-volume and multi-user environments such as servers or networking applications; may include single-user workstations required in demanding design, engineering, and audio/video applications.
error log	A record that contains error information.
error rate	The number of errors of a given type that occur when reading a specified number of bits.
ESD	Electrostatic Discharge. Rapid discharge of static electricity that can damage integrated circuits in computers and communications equipment. ESD prevention is aided by such items as ESD wrist straps and ESD hard drive bags.
Ethernet	A standard method of connecting computers to a Local Area Network (LAN) using coaxial cable, twisted pair, and fiber optic wiring standards.
extended partition	A partition on a disk where non-system files (other than DOS or operating system files) can be stored. Multiple partitions can be created on a hard disk: one primary partition and one or more extended partition(s). Operating system files must reside on the primary partition; logical drives can be created on an extended partition.

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F

FAT	File allocation table. A data table stored at the beginning of each partition on a disk and used by the operating system to determine which sectors are allocated to each file and in which sequence.
FAT32	A file allocation table system with a maximum file transfer of 4 GB and a maximum partition size of 32 GB.
FC	Fibre channel. The general name given to an integrated set of standards being developed by an ANSI-approved X3 group. This set of standards defines new protocols for flexible information transfer. Fibre channel supports three topologies: point-to-point, arbitrated loop, and fabric.
FC-AL	Fibre channel-arbitrated loop. A serial storage interface designed for high-end applications. A subset of FC network systems interconnection.
FDB	Fluid dynamic bearings. A design that incorporates a layer of lubricant instead of ball bearings in a hard drive spindle motor, thus providing increased storage capacity, non-operational shock resistance, speed control, robust shipping and handling, and improved acoustics.
FDISK	A software utility that partitions a hard drive.
Femto slider	Form factor in which the read/write head is mounted on the small, lightweight femto slider which allows the head to move more quickly from track to track on the disk.
fetch	The process of retrieving data.
FFS	Free-fall sensor. As an added layer of protection, if the drive (or the system it's in) is dropped while in use, WD's free-fall sensor detects that the drive is falling and, in less than 200 milliseconds, parks the head off the disks to help prevent damage and data loss.
FireWire® 400	FireWire400 supports data transfer rates up to 400 Mb/s.
FireWire 800	FireWire 800 has a maximum data transfer rate of 800Mb/s. It is backward-compatible with FireWire 400 using an optional adapter.
FireWire	This high-speed serial bus, also known as IEEE 1394, provides a non-proprietary, high-performance method of interconnecting digital devices.
firmware	Permanent instructions and data programmed directly into the circuitry of read-only memory for controlling computer operations.
FIT	Functional integrity testing. A suite of tests WD performs on all its drive products to ensure compatibility with different hosts, operating systems, adapters, application programs, and peripherals. This testing is performed before a product is released to manufacturing.

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flash drive	Compact, portable device that works in a similar way to a hard drive.
flash memory	A special type of portable electronic storage device used for easy and fast information storage in such devices as external hard drives and digital cameras. Examples of flash memory include PCMCIA cards and memory cards for video game consoles.
FlexPower™	Connector technology that accepts power from both industry-standard and new SATA power supplies.
flow control	The process of managing the rate of data transmission between two nodes to prevent a fast sender from outrunning a slow receiver.
form factor	An industry standard term for the physical and external dimensions of a device.
format	A process that prepares a hard drive to store data.
formatted capacity	The actual capacity available to store data in a mass storage device. The formatted capacity is the gross capacity minus the capacity used by overhead (formatting).
FTP	File Transfer Protocol. A network protocol used to transfer data from one computer to another through a network. FTP is a popular choice for exchanging files independent of the operating systems involved.
full-duplex	A communication protocol that permits simultaneous transmission in both directions.

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G

GB	Gigabyte. WD defines a gigabyte as 1,000,000,000 (one billion) bytes or 1000 (one thousand) MBs.
GMR	Giant magnetoresistive. An advanced form of head technology.
GPL	General Public License. Free software license which grants recipients rights to modify and redistribute the software which would otherwise be prohibited by copyright law.
GPS	Global positioning system. Provides specially coded satellite signals which can be processed in a GPS receiver to compute position, speed, and time.

H

half-duplex	A communications protocol that permits transmission in both directions but in only one direction at a time.
hard drive	An electromechanical device for information storage and retrieval, incorporating one or more rotating disks on which data is magnetically recorded, stored, and read. The principal products of WD.
hard error	An error that is repeated every time the same area on a disk is accessed.
hard sectored	A technique that uses a digital signal to indicate the beginning of a sector on a track.
HDA	Head disk assembly. The mechanical components of a hard drive, including disks, heads, spindle motor, and actuator.
head	Also known as a read/write head. An electromagnetic coil and metal pole that read/write magnetic patterns on a disk. A drive with several disk surfaces or platters has a separate head for each data surface. <i>See also</i> MR head .
head actuator	A motor that moves the head stack assembly in a hard drive to align read/write heads with magnetic tracks on the disks.
head crash	The damage incurred to a read/write head when the head comes into contact with a disk surface. A head crash may be caused by severe shock, dust, fingerprints, or smoke, and may damage the disk surface and/or head.
head loading zone	The area on a disk reserved for heads to take off or land when power to the drive is turned on or off. No data is stored in the head loading zone.
head stack assembly	An electromechanical component containing read/write heads and their supporting devices.

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headerless format	The lack of headers or ID fields (track format). This format enables greater efficiency and increased user capacity.
HFS	Hierarchical File System. File system developed by Apple Computer for use on computers running Mac OS.
high-level formatting	Formatting that erases all information on a hard drive and sets up the system for storing and retrieving files.
host	The computer to which other computers and peripherals connect. See also initiator.
host adapter	A plug-in board that acts as an interface between a computer system bus and a hard drive.
host interface	The point at which a host and a drive are connected to each other.
host transfer rate	The speed at which a host computer can transfer data across an interface.
hot plug	Act of swapping out a hard drive without having to power down the system or reboot. Hot plugging capability promotes system design flexibility, data availability, and serviceability.
hot swap	See hot plug .
HTTP	Hypertext Transfer Protocol. Protocol used by the World Wide Web to transfer information between servers and browsers.
HTTPS	HTTP over SSL. The use of Secure Socket Layer (SSL) or Transport Layer Security (TLS) as a sub-layer under regular HTTP application layering. HTTPS encrypts and decrypts user page requests as well as the pages that are returned by the Web server.
hub	A multiple port connection point for network devices, often used to connect segments of a LAN.

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I

I/O	Input/Output. An operation, program, or device that that transfers data to or from a computer or other device.
IcePack™	3.5-inch mounting frame with a built-in heat sink that keeps the 2.5-inch WD VelociRaptor extra cool when installed in a 3.5-inch drive bay.
IDE	Integrated drive electronics. A technology in which interface controller electronics are incorporated into the design of the hard drive rather than into a separate controller. <i>See also</i> PATA .
index pulse signal	A digital pulse signal indicating the beginning of a disk revolution. An embedded servo pattern or other prerecorded information is present on the disk following index.
initialization	<i>See</i> low-level formatting .
initiator	A device in control of the SCSI bus that sends commands to a target. Most SCSI devices have a fixed role as an initiator or a target; however, some devices can assume both roles.
input	Incoming data that a computer processes, such as user-issued commands.
IntelliPark™	Delivers lower power consumption by automatically unloading the heads during idle to reduce aerodynamic drag.
IntelliPower™	A fine-tuned balance of spin speed, transfer rate, and caching algorithms designed to deliver both significant power savings and solid performance.
IntelliSeek™	WD AV feature that optimizes seek speeds to lower power consumption, noise, and vibration.
interface	A hardware or software protocol to manage the exchange of data between a device and a computer; the most common ones are PATA (also known as EIDE), SATA, and SCSI.
interface controller	A chip or circuit that translates computer data and commands into a form usable by a hard drive and that controls data transfers between buffer and host. <i>See also</i> disk controller and disk drive controller .
interleave	The arrangement of sectors on a track.
interrupt	A signal sent by a subsystem to the CPU when a process either was completed or could not be completed.
IP	Internet Protocol. A system that controls how data messages are separated into packets, routed from the sender, and reassembled at the destination.
IP address	A 32-bit, binary number that uniquely identifies a computer connected to the Internet.

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ISA Industry Standard Architecture. The standard 16-bit AT bus for the PC/AT system. ISA was the only industry standard bus for PCs until the release of Peripheral Component Interconnect (PCI).

J

jumper An electrically-conductive component placed over pairs of pins extending from the circuit board on the hard drive jumper block to connect them electronically. Jumper placement is one method of designating a hard drive as Master or Slave.

K

KB Kilobyte. Usually, this is a unit of 1000 bytes. In computer memory, which is partitioned into sizes that are a power of 2, a kilobyte is equal to 2^{10} or 1024 bytes.

knowledge base A searchable database containing information and answers on technology-related topics and questions. WD's expert knowledge base answers questions relating to WD products.

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L

LAN	Local Area Network. A system in which computer users in the same company or organization are linked to each other and often to centrally-stored collections of data in LAN servers.
landing zone	A location on the inner part of a disk to which heads move when commanded or when powered off. User data is not stored in the landing zone.
laser textured media	A treatment that minimizes friction and wear on a hard drive. The precision and consistency of this process contributes to the robustness of WD drives.
latency	The period of time that read/write heads wait for a disk to rotate to the correct position for accessing requested data. For a disk rotating at 5200 RPM, average latency is 5.8 milliseconds (one-half the revolution period).
LBA	Logical block addressing. A method of addressing sectors on a drive as a single group of logical block numbers rather than cylinder, head, and sector addressing (CHS). LBA allows accessing larger drives than is normally possible with CHS addressing.
LED	Light Emitting Diode. A device that lights up when power is passed through it.
logical address	A storage address, which may not describe the physical location, for requesting data retrieval. A controller converts a request from a logical to a physical address and is able to retrieve data.
logical drive	A section of a hard disk that appears to be a separate drive in a directory structure. Up to 23 logical drives can be created on an extended partition of a hard disk, using letters A-Z with three reserved: A and B for diskette drives, and C for the first primary DOS partition. Logical drives are commonly used for group directories and files.
low-level formatting	A process, also called initialization, that prepares a hard drive to store data. Low-level formatting sets up the locations of sectors so that user data can be stored in them. Low-level formatting is performed at the WD factory; users need not perform low-level formatting on a WD drive.
LUL	See Ramp Load/Unload (LUL)

M

magnetic flux	A pattern of magnetic pole directions of bits written on the disk.
Master	The primary drive in a dual-drive configuration. A Master drive by itself (with no Slave) is called a single drive.
MB	Megabyte. WD defines a megabyte as 1,000,000 (one million) bytes.

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mechanical latency	A time period, including both seek time and rotational latency. Mechanical latencies are the main hindrance to higher performance in hard drives and are one hundred times greater than electronic (non-mechanical) latencies associated with data transfers. See also rotational latency and seek time.
media	In hard drives, the disks and their magnetic coatings. Sometimes refers only to the coating material.
memory	A device or system capable of storing and retrieving data.
MFM	Multiple frequency modulation. A method of encoding analog signals into magnetic pulses or bits.
MioNet®	WD's remote computer access service. Adding MioNet to your home or work computer provides secure and instant access from any PC in the world back to your computer. You can use your applications and access and share files on your computer or storage device from anywhere.
mirroring	The process of generating an exact copy of saved data from one drive to another drive within a RAID 1 system. Each drive can be accessed and read separately. A mirrored drive can be removed from a system while the other drive(s) are still active. <i>See also</i> RAID 1 .
MP3	MPEG-audio layer 3. A digital audio coding scheme for distributing music over the Internet.
MR head	Magnetoresistive head. MR heads were developed to increase areal density and improve drive performance. These heads use an inductive element for writing data and a separate magnetoresistive element for reading data, rather than traditional inductive thin-film, read/write heads. The read element has a magnetically sensitive material that detects data recorded on the magnetic disk surface. MR head construction results in a stronger signal than that produced by inductive thin-film, read/write heads, which allows reading higher areal density data.
MTBF	Mean time between failures. The average time (expressed in hours) that a component works without failure. This time is calculated by dividing the total number of operating hours observed by the total number of failures. Also, the length of time a user may reasonably expect a device or system to work before an incapacitating fault occurs.
MTTR	Mean time to repair. The average time it takes to repair a drive in the field. Only major subassemblies (the PCB, sealed housing, etc.) are changed in the field; component level repairs are not performed in the field.
multimedia	A simultaneous presentation of data in more than one form, such as by means of both video and audio.
multi-user	A system in information technology that enables more than one user to access data at the same time.

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My Book®

Trade name for WD external hard drives with a book-shaped enclosure.

**My DVR
Expander™
eSATA Edition™**

WD external device that adds additional storage capacity to a DVR with an enabled eSATA port.

**My DVR
Expander™
USB Edition™**

WD external device that adds additional storage capacity to a DVR with an enabled USB port.

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N

NAS	Network attached storage. Hard drive storage set up with its own network address rather than being attached to the computer that is serving network workstation users.
NAT	Network Address Translation. Used in gateway devices that form the boundary between the public Internet and the private LAN. As IP packets from the private LAN traverse the gateway, NAT translates a private IP address and port number to a public IP address and port number, tracking those translations to keep individual sessions intact.
NCQ	Native command queuing. A command protocol implemented only on native SATA hard drives. It allows multiple commands to be outstanding within a drive at the same time. Drives that support NCQ have an internal queue where outstanding commands can be rescheduled and re-ordered dynamically, along with necessary tracking mechanisms for outstanding and completed parts of the workload. NCQ also has a mechanism that allows the host to issue additional commands to the drive while the drive is seeking data for another command.
NetCenter™	Trade name for WD's first generation external network hard drive.
network computer	A computer with limited data storage capacity that communicates with a central data storage facility such as a server or RAID system.
NFS	Network File System. A network file system protocol that allows a user on a client computer to access files over a network as easily as if the network devices were attached to its local disks. Normally associated with UNIX systems.
NoTouch™	WD ramp load technology that prevents the recording head from touching the disk media, which ensures significantly less wear to the recording head and media as well as better drive protection in transit.
NTFS	NT file system. A file system, designed for Windows® NT, that supports long filenames, security access control, recovery, and other features.

O

OEM	In the case of WD, OEM customers are companies such as Dell and HP.
operating system	Software that allows users and programs installed on your system to communicate with computer hardware such as a hard drive.

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P

Partition	A logical division on a hard drive that the operating system treats as a separate hard drive. Each partition is assigned a unique drive letter.
passive termination	A termination architecture that matches impedance at the end of the SCSI bus by using a voltage divider network of passive resistors.
PATA	Parallel Advanced Technology Attachment. A technology in which interface controller electronics are incorporated into the design of the hard drive rather than into a separate controller. Also known as IDE.
PC	Personal computer.
PIO	Programmed I/O. In a hard drive with an AT interface, data transfers between a drive and a host using programmed I/O (PIO). A host uses PIO to write to command block registers (CBRs) when transmitting control information, such as the location of a read command.
platform	A basic design from which a series of products is engineered and produced.
platter	A metal (or other rigid material) disk mounted inside a fixed-disk drive. Many drives consist of multiple platters mounted on the spindle to provide more data storage surfaces. A platter may use one or both surfaces to store data.
PMR	Perpendicular Magnetic Recording. Hard drive recording method in which the magnetization of each data bit is aligned vertically to the spinning disk. PMR provides the ability to store more data on a given disk than the longitudinal recording method, enabling the manufacture of hard drives with higher capacities.
port	A specialized outlet on a device for connecting to other devices using a cable or a plug. Ethernet ports, power ports, and USB ports are examples. Also a connection or socket on the motherboard or controller card. A motherboard may have one or two ports (primary and secondary).
pre-fetch	Instructions loaded into a queue when the processor's external bus is otherwise idle.
primary partition	The partition where operating system files are stored. To start your operating system from a hard drive, it must have a primary partition and the primary partition must be active.
PRML	Partial response maximum likelihood. A read channel that uses sampled data, active equalization, and Viterbi detection to retrieve user data accurately from disk.
protocol	A convention of data transmission that defines timing, control format, and data representation.
proximity recording	A technology that increases recording density by allowing a read/write head to come into close proximity to a disk surface.

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PUIS	Power-up in Standby. Feature set that allows devices to be powered-up into the Standby power management state to minimize inrush current at power-up and to allow the host to sequence the spin-up of devices.
PVR	Personal video recorder.
PWL	Preemptive wear leveling. Mechanical feature in which the drive arm frequently sweeps across the disk to reduce uneven wear on the drive surface common to audio video streaming applications.

Q

queue	A first-in-first-out (FIFO) data structure to sequence multiple demands for a resource such as a printer, processor, or communication channel. A host appends objects to the end of a queue and removes them from the front.
quota	Maximum storage capacity assigned by the administrator to each user on a computer network.

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R

radial path	The straight-line path from the center of the disk to the outer edge.
RAFF™	Rotary Acceleration Feed Forward. WD technology that maintains the highest possible data transfer performance in the high rotational vibration environments commonly found in servers and storage arrays.
RAID	Redundant array of independent disks. A grouping of hard drives in a single system to provide greater performance and data integrity.
RAID 0	RAID protocol in which data is striped across multiple hard drives, enabling the accelerated reading and recording of data by combining the work of two or more drives to increase performance. <i>See also</i> striping .
RAID 1	RAID protocol in which two copies of the data are instantaneously recorded - each on separate hard drives. RAID 1 ensures the protection of users' data because in the event that one of the hard drives fails, the other hard drive(s) will continue to read and write data until the faulty hard drive is replaced and rebuilt to once again safely mirror the data. <i>See also</i> mirroring .
RAID 5	For systems with three or more drives, RAID 5 offers fast performance by striping data across all drives; data protection by dedicating a quarter of each drive to fault tolerance leaving three quarters of the system capacity available for data storage.
RAM	Random access memory. Memory that allows any storage location to be accessed randomly.
Ramp Load/Unload (LUL)	Ramp load parks the recording head off the media when the drive is idle and on spin up, maximizing available disk space and minimizing power usage, which results in lower heat and long-term drive reliability.
RE	RAID edition. A WD drive engineered to thrive in a high-intensity RAID system while still offering traditional desktop value.
read channel	The channel that performs data encoding and conversion that a drive requires to write computer generated information onto a magnetic medium and read back that information with a high degree of accuracy.
read verify	A data accuracy check performed by having a disk read data from a controller, which in turn checks for errors but does not pass data to the system.
read/write head	<i>See</i> head .
recoverable error	A read error that can be corrected by ECC or by re-reading data.
RLL	Run length limited. An encoding scheme used during write operations to facilitate reading that data.

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RoHS	Restriction of Hazardous Substances. This compliance Directive 2002/95/EC of the European Parliament, which is effective in the EU beginning July 1, 2006, aims to protect human health and the environment by restricting the use of certain hazardous substances such as lead, mercury, hexavalent chromium, cadmium, polybrominated biphenyl flame retardants, and polybrominated diphenyl ether flame retardants in new equipment.
ROM	Read-only memory. An integrated circuit memory chip containing programs and data that the computer or host can read but cannot modify. A computer can read instructions from ROM but cannot store data in ROM.
rotational latency	The amount of delay in obtaining information from a disk due to disk rotation. For a disk rotating at 5400 RPM, the average rotational latency is 5.5 milliseconds. <i>See also</i> mechanical latency .
RPM	Rotations per minute. Also known as spindle speed. Rotational speed of a medium (disk). Hard drives typically spin at a constant speed. The lower the RPM, the higher the mechanical latency. Disk RPM is a critical component of drive performance, as it directly affects rotational latency.
RPS™	Reduced power spinup. The WD-optimized spinup feature specifically designed for the external hard drive and consumer electronics markets.

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S

Safe Shutdown™	A WD-exclusive feature that ensures all data is transferred before shutting down the drive.
SATA	Serial advanced technology attachment. A standard for connecting hard drives to computer systems, based on serial signaling technology. Its practical advantages over PATA (also known as EIDE) are longer and thinner cables for more efficient airflow within a form factor, fewer pin conductors for reduced electromagnetic interference, and lower signal voltage to minimize noise margin.
SAS	Serial Attached SCSI. A point-to-point serial interface that links controllers directly to hard drives. Unlike traditional parallel SCSI, SAS allows up to 128 devices of different sizes and types to be connected simultaneously with longer, thinner cables. SAS drives can also be hot-plugged.
SCA-2	SCA-2 (Single Connector Attach) interface incorporates a grounding contact, blindmate connector, direct plug misalignment tolerance, The number of errors of a given type that occur when reading a specified number of bits. protection, hot swap capability, and backplane connector options for SCSI devices. SCA-2 is commonly called the 80-pin SCSI connector.
SCAM	SCSI configure automatically. Allows users to attach SCSI devices without worrying about configuration options.
SCSI	Small computer system interface. An interface between a computer and peripheral controllers, commonly used in enterprise computing and Macintosh systems. Pronounced scuzzy.
SCSI device	A host computer adapter, peripheral controller, or intelligent peripheral that can be attached to a SCSI bus.
sector	A 512-byte packet of data. This is the smallest amount of data that can be read from or written to a hard drive from a host interface.
sector slipping	A technique used to push-down defective sector sites during a format or reassignment operation to maintain sequential order of the data. Spares are located throughout the disk for this purpose.
SecureConnect™	WD's SATA cable connection system designed to provide a stable, secure attachment between a hard drive and a cable.
SecurePark™	Parks the recording heads off the disk surface during spin up, spin down and when the drive is off. This ensures the recording head never touches the disk surface resulting in improved long term reliability due to less head wear and improved shock tolerance.
seek	The movement of read/write heads to a specified location. The actuator moves heads to the cylinder containing the track and sector of stored data.
seek time	A measure (in milliseconds) of how fast a hard drive can move its read/write heads to a specific location.

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sequential access	The reading or writing of data in a sequential order as opposed to random access. Magnetic tape drives store data in sequential blocks.
server	A computer used primarily to store data, providing access to shared resources. Usually contains a network operating system.
servo burst	Provides positioning information to the actuator arm, found at equal intervals on each disk surface (embedded servo) or on an entire surface (dedicated servo).
share	A folder that can be used to organize and store files on a network storage system. Shares can be shared with everyone (public) or with selected users on your network (private).
Shock Guard™	WD technology to protect the drive mechanics and delicate platter surface from shocks, both when it's in use and when it's not.
ShockShield™	WD packaging that provides double protection from rough handling and static damage. A protective wrapping that consists of a static protection envelope securely packed inside a plastic case.
SilkStream™	WD AV feature that provides for smooth, continuous digital video playback of multiple simultaneous hard drive streams.
single-ended SCSI	The standard electrical interface for SCSI. Single-ended means an interface with one signal and one corresponding ground line for each SCSI signal. Used primarily in applications requiring cable lengths under 19 feet (6 meters).
Slave	The secondary drive in a dual-drive configuration.
S.M.A.R.T.	Self-monitoring, analysis, and reporting technology. A technology to assist users in preventing system down time due to hard drive failure; it attempts to predict hard drive failure before it occurs.
SmartPower™	Intelligent drive management system that automatically powers a device on and off with the computer.
SMB	Server Message Block. File-sharing protocol for Windows platform that allows users to access shares through My Network Places. Mac OS X or later also supports the SMB protocol.
SMTP	Simple Mail Transfer Protocol. Standard for transferring e-mail across the Internet.
spanned	Combination of drives in a linear fashion to create one large logical volume. A spanned drive is like a single, bigger drive, in that files written to the volume earlier go at the "beginning" of the volume, on the first physical drive. If one of the drives fails, all data is lost.
SPC	SCSI Primary Commands.
soft error	An error that does not repeat when the same location is re-read.
soft reset	ATA reset type in which the drive resets the interface circuitry according to the Set Features command requirement.
soft sectored	A technique that allows a controller to determine the beginning of a sector by reading format information from a disk.

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SoftSeek™	A WD algorithm used with WhisperDrive™ technology to deliver the quietest 2.5-inch hard drive on the market.
sound pressure	A value representing the sound level emitted by a hard drive from a single point. Only one microphone is used to measure sound pressure.
sound power	A value measured using 8-12 microphones which represents the sound level emitted from the entire hemispherical area surrounding the drive. Because sound power more closely corresponds to the sound level detected by the human ear, it is used as the industry standard for measuring hard drive acoustics.
spindle	The center, rod-like axle on which the disks are mounted.
spindle motor	The motor that rotates the spindle and ultimately the disks.
spindle speed	See RPM .
spindle synchronization	In multiple-drive systems, a feature that causes SCSI hard drives to rotate to the same address location at the same time.
SSA	Serial Storage Architecture. The general name given to a set of standards being developed by an ANSI-approved X3 group. This set of standards defines a new serial interface with a flexible addressing scheme.
SSC	Spread Spectrum Clocking. Feature that controls electromagnetic interference output in hard drives.
SSH	Secure Shell. A network protocol that uses encryption and authentication keys to enable two devices on the network to exchange data securely.
SSL	Secure Socket Layer. A protocol that provides authentication and encryption services between a web server and a web browser.
StableTrac™	The motor shaft of the hard drive is secured at both ends to reduce system-induced vibration and stabilize platters for accurate tracking during read and write operations.
storage capacity	The amount of data that can be stored on a hard drive.
striping	The spread of data over multiple hard drives to improve performance. See also RAID 0 .
streaming media	Media such as audio, video, and photos that are constantly received while being delivered by a streaming provider.
structure-borne acoustics	When mounted in a digital device, the hard drive generates additional noise as a result of vibration. This type of noise, caused by the hard drive's proximity to other system components, is referred to as structure-borne acoustics.
subsystem	A secondary or component part of a system, as a hard drive is a subsystem of a personal computer.

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surface	The top or the bottom side of a platter coated with a magnetic material required to record data. A platter may use one or both surfaces to store data.
synchronous transmission	Transmission in which the sending and receiving devices operate continuously at the same frequency and are held in a desired phase relationship by a correction device.
system files	The files required to run an operating system.
system integrator	An independent professional who specifies and provides the necessary combinations of hardware and software in response to end user needs.

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T

TB	Terabyte. One trillion bytes (1000 GB) of data.
TCP/IP	Transmission Control Protocol/Internet Protocol. A set of protocols for communication over interconnected networks. The standard for data transmission over networks.
TCQ	Tagged Command Queuing. Type of command queuing in which random reads and writes are intelligently ordered to read/write to/from the nearest disk sectors. Intelligently ordered (queued) commands avoid additional revolutions of the hard drive and greatly improve performance.
TFI	Thin-film inductive. A head technology using a thin-film inductive element to read and write data bits on the magnetic surface of a disk.
thin client architecture	A computer system in which data is stored centrally, with only limited storage capacity at its various points of use.
thin film	A coating deposited on a flat surface through a photolithographic process. Thin film is used on disk platters and read/write heads, as well as on the write elements of MR heads.
TLER	Time-limited error recovery. Technology that improves error handling coordination with RAID adapters and prevents drive fallout caused by lengthy error-recovery processes.
TLS	Transport Layer Security. Successor to SSL. <i>See also</i> SSL .
TPI	Tracks per inch. Also known as track density. The number of tracks written within each inch of a disk surface, used to measure how closely tracks are packed on a disk surface.
track	A concentric magnetic circle pattern on a disk surface used for storing and reading data.
track-to-track seek time	The time for a read/write head to move from one track to an adjacent track.
transfer rate	The rate at which a hard drive sends and receives data from a controller. Processing, head switches, and seeks must all be included in the transfer rate to accurately portray drive performance. The burst mode transfer rate is different from the transfer rate, as it refers only to the transfer of data into RAM.
triple interface	An external storage device with three interfaces available for connection to the computer.
TuMR	Tunneling magneto resistive (TuMR) heads. Next-generation head design that provides greater signal output which translates into greater signal to noise ratio, enabling higher storage densities.
two mirror mode	Mode available when four drives are installed in a device. In this mode, two independent RAID 1 volumes are created.

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U

Ultra ATA	A high-speed host data transfer feature that transfers data at up to 133 MB per second. <i>See also</i> Ultra DMA .
Ultra DMA	A protocol for transferring data between a hard drive through the bus to the computer's RAM. Also known as Ultra ATA, Ultra ATA/66, Ultra ATA/100, and Ultra ATA/133.
Ultra/150 CQ	A technology that optimizes the sequence of data transfers from the host to the hard drive, providing increased data transfer efficiency and resulting in higher performance for enterprise applications.
uncorrectable error	An error that cannot be overcome using error detection and correction.
unformatted capacity	The total number of usable bytes on a disk, including the space that is required to record location, boundary definitions, and servo data. <i>See also</i> formatted capacity .
unrecoverable error	A read error that cannot be overcome by an ECC scheme or by rereading the data when host retries are enabled.
untagged queuing	The ability of a drive to receive a maximum of one input/output (I/O) process from each initiator.
upgrade	In hard drives, the replacement of a hard drive with one offering greater capacity or performance or both.
UPnP	Universal Plug n Play. A set of computer network protocols that simplify the implementation of networks in the home by allowing devices to connect seamlessly. <i>See also</i> protocol .
UPnP NAT traversal	Combines UPnP and NAT features.
UPS	Uninterruptible Power Supply. A standalone device that provides secondary power to connected equipment in the event of a power failure.
USB	Universal serial bus. A serial bus for connecting peripherals to a microcomputer. It connects external drives, printers, modems, mice, keyboards, etc., through a single, general-purpose port. It can automatically add and configure new devices without having to shut down and restart the system.
USB 2.0	Hi-Speed USB (USB 2.0) supports data transfer rates up to 480Mb/s. USB 2.0 is backward-compatible with USB 1.1. If you connect to a USB 1.1 device, data is transferred at USB 1.1 speed (up to 1.1 Mb/s).

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V

Viterbi Detection An algorithm used in read channel technology that detects an entire sequence of data bits at once and determines the most likely sequence of data bits by comparing an actual sequence of data bit samples with possible sequences of data bit samples to accurately detect data written to disk.

Voice Coil An actuator motor. The force of a magnetic rotary voice coil produces a movement of the head that is proportionate to the force exerted by the coil.

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W

WAN	Wide Area Network. A computer network that crosses metropolitan, regional, or national boundaries.
WD AV	The trade name for WD's line of hard drives for audio/video applications.
WD AV-GP	Trade name for WD's line of eco-friendly audio/video hard drives that deliver power savings as the primary attribute.
WD Backup™	Easy-to-use software for immediate and scheduled data backups and restoring of files.
WD Caviar®	The trade name for WD's line of hard drives for desktop personal computers.
WD Caviar® Black™	Trade name for WD's line of high performance desktop drives.
WD Caviar® Blue™	Trade name for WD's line of desktop drives designed for everyday computing.
WD Caviar® Green™	Trade name for WD's line of eco-friendly desktop hard drives that deliver power savings as the primary attribute.
WD Discovery™	WD software application that allows the host computer to find one or more WD network storage systems in the same network segment.
WD GreenPower Technology™	WD technology that yields lower operating temperatures for increased reliability and low acoustics for ultra-quiet PCs and external drives.
WD Passport®	The trade name for WD's line of portable external hard drives.
WD Raptor®	The trade name for WD's line of Enterprise hard drives.
WD Raptor® X	The trade name for WD's line of Gamer hard drives.
WD RE	The trade name for WD's line of RAID Edition desktop hard drives.
WD RE4	The trade name for WD's latest generation of RAID Edition "designed for Enterprise" desktop hard drives.
WD RE4-GP	Trade name for WD's latest generation of eco-friendly enterprise hard drives that deliver power savings as the primary attribute.
WD Scorpio®	The trade name for WD's line of 2.5-inch internal hard drives.
WD Scorpio® Black™	Trade name for WD's line of high performance notebook drives.
WD Scorpio® Blue™	Trade name for WD's line of notebook drives designed for everyday computing.
WD ShareSpace™	Trade name for WD's 4-bay network storage system.

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WD SmartWare™	WD's easy-to-use backup and encryption software that visually presents data in a control center, providing peace of mind that precious photos, videos and files are securely protected.
WD Sync™	WD synchronization and encryption software.
WD VelociRaptor™	The trade name for WD's line of 10,000 RPM, 2.5-inch enterprise hard drives.
WhisperDrive™	A WD acoustic technology that significantly reduces hard drive noise levels.
Winchester Disk	The former code name for an early IBM hard disk model, sometimes still used to refer to the technology and design of most traditional hard drives.
Windows®	An operating system for desktop computers.
word	Two bytes that are processed together in a single operation.
workstation	A personal computer with exceptional capacity and performance capabilities for use mainly in engineering, design, and audiovisual applications, which demand immediate access to data and the ability to manipulate it in technically sophisticated ways.
write	The recording of flux reversals onto the magnetic surface of a disk.
write cache	High speed RAM used to buffer data transfers from a host to a hard drive.
write verify	A feature which verifies that data written to a disk is readable. Immediately after writing data to a disk, a drive with this feature verifies that it can read the data just written. If the drive is unable to read the data, it writes the data to another area of the disk and attempts to write verify again.

Z

Zoned Recording	Increases the number of sectors on the outer tracks of a drive, since the circumference of outside tracks is greater. This type of recording affords more disk capacity, because there can be more sectors on larger outer tracks than would be possible if the number of sectors per track were constant for the whole drive.
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