

Overview

Introduction

SATA 7200 rpm drives are our standard high bandwidth hard drive storage options; most workstation models are also available with high performance 10K rpm rotation speeds. Storage capabilities range up to a massive 2.0 TB.

The 7200 rpm HDDs (Hard Disk Drives) are all 3.5" drives. The 10K rpm drives are SFF (Small Form Factor, 2.5") drives (available bare and in 3.5" frames); the appropriate choice depends on drive bay availability in a chassis.

SMART technology

Self Monitoring Analysis and Reporting Technology (SMART) hard drive technology allows hard drives to monitor their own health and to raise flags if imminent failures are predicted. If the drive determines that a failure is imminent, the SMART hard drive technology enables intelligent manageability or management software to generate a fault alert. While the legacy versions of SMART hard drives do a good job monitoring the data on the hard drive media, the ever increasing emphasis on reliability and quality has prompted HP to implement SMART IV technology which constantly checks that the data flow from host interface to media and media to host interface is not compromised. This is accomplished by inserting a parity code into every 512 byte block in the data path of the hard drive's Cache RAM. This parity checking performed by HP's SMART IV technology hard drives, allows for more complete error detection coverage encompassing the entire data path between the host and the hard drive.

Smart IV is also known as IOEDC: I/O Error Detection Code.

Restrictions on Hazardous Substances (RoHS)

RoHS is a European Union directive that requires OEM manufacturers' compliance. The directive assures that hazardous substances are not contained within electronic equipment. Those substances include lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls and polybrominated diphenyl ethers. Hewlett-Packard is committed to adhering to this directive.

Native Command Queuing

NCQ, or Native Command Queuing, is a capability of modern SATA drives. NCQ is a SATA protocol extension that allows the hard drive to have several write or read commands outstanding at the same time. In contrast, normal non-queued operation requires each command to be completed before the next command is issued by the host system. Queuing allows the drive to complete the commands in the order that allows for best overall throughput. It also involves an advanced method of transferring data to or from the host, called First Party Direct Memory Access (FPDMA), that allows the hard drive and the host controller to manage the data transfers for multiple outstanding commands, without involving the host processor. NCQ can contribute to better performance but the results are dependent on many factors, including the access patterns of the various applications and operating system functions that are initiating drive accesses. It requires support from the host system BIOS, controller, and driver in order to be useful. However NCQ-capable drives are compatible with host systems that do not include the support; the NCQ and FPDMA features are simply not used on those systems.

Self Encrypting Drive (SED) support

The Trusted Computing feature set which has been developed by the Trusted Computing Group (TCG) is supported. Specifically, the Opal Security Subsystem class (SSC) is supported. This feature allows the HDD to do the following:

- Deploy Storage Device and Take Ownership: the HDD is integrated into its target system and ownership transferred by setting or changing the Storage Device's owner credential.
- Activate or Enroll Storage Device: LBA ranges are configured and data encryption and access control credentials (re)generated and/or set on the Storage Device. Access control is configured for LBA range unlocking.
- Lock and Unlock Storage Device: unlocking of one or more LBA ranges by the host and locking of those ranges under host control via either an explicit lock or implicit lock triggered by a reset event. MBR shadowing provides a mechanism to boot into a secure pre-boot authentication environment to handle device unlocking.
- Repurpose and End-of-Life: erasure of data within one or more LBA ranges and reset of locking credential(s) for Storage Device repurposing or decommissioning.

GB = 1 billion bytes. Actual available capacity is less.

Today, the HP Z210 CMT and SFF platforms fully support the HP 320GB SATA 7.2K SED SFF HDD. Additional platforms will support this technology in the coming months.



Overview

Performance

SATA Hard Drives use the SATA II interface running at up to 3 Gb/s or the next generation SATA III interface running at up to 6Gb/s. Actual sustained transfer rates are lower due to command protocol and SATA bus management overhead.

Models

600GB SATA 10K rpm SFF in 3.5" Frame HDD	XP309AA
600GB SATA 10K rpm SFF HDD	XQ245AA
300GB SATA 10K rpm SFF in 3.5" Frame HDD	FM802AA
300GB SATA 10K rpm SFF HDD	FX619AA
160GB SATA 10K rpm SFF in 3.5" Frame HDD	EW222AA
160GB SATA 10K rpm SFF HDD	FX618AA
2.0TB SATA 7200 rpm 3Gb/s 3.5" HDD	WE464AA
1.5TB SATA 7200 rpm 3Gb/s 3.5" HDD	VH997AA
1TB SATA 7200 rpm 3.0Gb/s 3.5" HDD	GE262AA
500GB SATA 7200 rpm 3Gb/s 3.5" HDD	PV943A
320GB SATA 7200 rpm 3Gb/s 3.5" HDD	FH963AA
250GB SATA 7200 rpm 3Gb/s 3.5" HDD	PY278AA
160GB SATA 7200 rpm 3Gb/s 3.5" HDD	PV944A
3.0TB SATA 7200 rpm 6Gb/s 3.5" HDD	QF298AA
1TB SATA 7200 rpm 6Gb/s 3.5" HDD	LQ037AA
500GB SATA 7200 rpm 6Gb/s 3.5" HDD	LQ036AA
250GB SATA 7200 rpm 6Gb/s 3.5" HDD	LQ034AA
2.0TB SATA 7200 rpm 6Gb/s 3.5" HDD	QB576AA
HP 320GB SATA 7.2K SED SFF HDD	(not available as AMO today)

Compatibility

Most SATA Hard Drives are compatible with all of the current HP Z-series Workstations (check the individual workstation QuickSpecs for current hard drive compatibility information).

The 3.0TB SATA HDD is only compatible for use today with the Z800 and must be attached to the LSI9260 SAS Controller Card. The 3.0TB capacity will not be realized if the drive is attached to the onboard SATA controller for Z400, Z600, and Z800.

When ordering drives as After Market Options for use in an optical bay, order an appropriate bracket as follows:

- HP Z-series Workstations
 - 3.5" drive bracket for HP Z400, Z600 and Z800, HP Optical Bay HDD Mounting Bracket-BLK-for WKS, HP Part Number NQ099AA
 - 2.5" (SFF) bracket for Z600 and Z800, HP 2.5in HDD 2:1 Optical Bay Bracket, HP Part Number FX615AA
- HP xw4600 or xw6600 Workstation: 3.5" drive bracket, HP Optical Bay HDD Mounting Bracket, HP Part Number DY659AA.

Not all hard drive models are available in all regions.

Overview

Service and Support

Your Option Limited Warranty is a one (1) year (HP Option Limited Warranty Period) parts replacement warranty on any HP-branded or Compaq-branded options (HP Options). If your HP Option is installed in an HP Hardware Product, HP may provide warranty service either for the HP Option Limited Warranty Period or the remaining Limited Warranty Period of the HP Hardware Product in which the HP Option is being installed, whichever period is the longer but not to exceed three (3) years from the date you purchased the HP Option.

Technical Specifications

Hard Drives	600GB SATA 10K rpm SFF in 3.5" Frame HDD	Capacity	600GB	
		Height	1 in; 2.54 cm	
		Width	Media Diameter	2.5 in; 6.36 cm
			Physical Size	4 in; 10.17 cm
		Interface	Serial ATA (3.0Gb/s)	
		Synchronous Transfer Rate (Maximum)	Up to 300MB/s	
		Buffer	32MB	
		Cache	Segmentable	
		Seek Time (typical reads, includes controller overhead, including settling)	Single Track	0.4 ms (max)
			Average	3.6 ms
			Full-Stroke	9.0 ms
		Rotational Speed	10,000 rpm	
		Logical Blocks	1,172,123,568	
		Operating Temperature	41° to 131° F (5° to 55° C)	
			600GB SATA 10K rpm SFF HDD	Capacity
Height	0.6 in; 1.53 cm			
Width	Media Diameter			2.5 in; 6.36 cm
	Physical Size			2.75 in; 6.99 cm
Interface	Serial ATA (3.0Gb/s)			
Synchronous Transfer Rate (Maximum)	Up to 300MB/s			
Buffer	32MB			
Cache	Segmentable			
Seek Time (typical reads, includes controller overhead, including settling)	Single Track			0.4 ms (max)
	Average			3.6 ms
	Full-Stroke			9.0 ms
Rotational Speed	10,000 rpm			
Logical Blocks	1,172,123,568			
Operating Temperature	41° to 131° F (5° to 55° C)			
	300GB SATA 10K rpm SFF in 3.5" Frame HDD			Capacity
		Height	1 in; 2.54 cm	
		Width	Media Diameter	2.5 in; 6.36 cm
			Physical Size	4 in; 10.17 cm
		Interface	Serial ATA (3.0 Gb/s), Native Command Queuing enabled	
		Synchronous Transfer Rate (Maximum)	Up to 300 MB/s	
		Cache	16 MB	
		Seek Time (typical reads, includes controller overhead, including settling)	Single Track	0.7 ms (maximum)
			Average	4.4 ms
			Full-Stroke	9.5 ms
		Rotational Speed	10,000 rpm	

Technical Specifications

300GB SATA 10K rpm SFF HDD	Logical Blocks		586,072,368
	Operating Temperature		41° to 131° F (5° to 55° C)
	Capacity	300,069,052,416 bytes	
	Height	0.6 in; 1.53 cm	
	Width	Media Diameter	2.5 in; 6.36 cm
		Physical Size	2.75 in; 6.99 cm
	Interface	Serial ATA (3.0 Gb/s), Native Command Queuing enabled	
	Synchronous Transfer Rate (Maximum)	Up to 300 MB/s	
	Cache	16 MB	
	Seek Time (typical reads, includes controller overhead, including settling)	Single Track	0.7 ms (maximum)
		Average	4.4 ms
		Full-Stroke	9.5 ms
	Rotational Speed	10,000 rpm	
	Logical Blocks	586,072,368	
	Operating Temperature		41° to 131° F (5° to 55° C)
160GB SATA 10K rpm SFF in 3.5" Frame HDD	Capacity	160,041,885,696 bytes	
	Height	1 in; 2.54 cm	
	Width	Media Diameter	2.5 in; 6.36 cm
		Physical Size	4 in; 10.17 cm
	Interface	Serial ATA (1.5 Gb/s), Native Command Queuing enabled	
	Synchronous Transfer Rate (Maximum)	Up to 300 MB/s	
	Buffer	16 MB	
	Seek Time (typical reads, includes controller overhead, including settling)	Single Track	0.7 ms (maximum)
		Average	4.4 ms
		Full-Stroke	9.5 ms
	Rotational Speed	10,000 rpm	
	Logical Blocks	312,581,808	
	Operating Temperature		41° to 131° F (5° to 55° C)
160GB SATA 10K rpm SFF HDD	Capacity	160,041,885,696 bytes	
	Height	0.6 in; 1.53 cm	
	Width	Media Diameter	2.5 in; 6.36 cm
		Physical Size	2.75 in; 6.99 cm
	Interface	Serial ATA (3.0 Gb/s), Native Command Queuing enabled	
	Synchronous Transfer Rate (Maximum)	Up to 300 MB/s	
	Cache	16 MB	
	Seek Time (typical reads, includes controller overhead, including settling)	Single Track	0.7 ms (maximum)
		Average	4.4 ms
		Full-Stroke	9.5 ms

Technical Specifications

2.0TB SATA 7200 rpm 3Gb/s 3.5" HDD	Rotational Speed	10,000 rpm	
	Logical Blocks	312,581,808	
	Operating Temperature	41° to 131° F (5° to 55° C)	
	Capacity	2.0TB	
	Height	1 in; 2.54 cm	
	Width	Media Diameter	3.5 in; 8.9 cm
		Physical Size	4.0 in; 10.17 cm
	Interface	Serial ATA (3.0 Gb/s), Native Command Queuing Enabled	
	Synchronous Transfer Rate (Maximum)	Up to 300MB/s	
	Buffer	64MB	
	Seek Time (typical reads, includes controller overhead, including settling)	Single Track	1.0 ms
		Average	10 ms
		Full-Stroke	Not Specified
	Rotational Speed	7,200 rpm	
1.5TB SATA 7200 rpm 3Gb/s 3.5" HDD	Logical Blocks	3,907,029,168	
	Operating Temperature	41° to 131° F (5° to 55° C)	
	Capacity	1.5TB	
	Height	1 in; 2.54 cm	
	Width	Media Diameter	3.5 in; 8.9 cm
		Physical Size	4.0 in; 10.17 cm
	Interface	Serial ATA (3.0 Gb/s), Native Command Queuing enabled	
	Synchronous Transfer Rate (Maximum)	Up to 300MB/s	
	Buffer	32MB	
	Seek Time (typical reads, includes controller overhead, including settling)	Single Track	2 ms
		Average	11 ms
		Full-Stroke	21 ms
	Rotational Speed	7,200 rpm	
	Logical Blocks	2,930,277,168	
	Operating Temperature	41° to 131° F (5° to 55° C)	
1TB SATA 7200 rpm 3.0Gb/s 3.5" HDD	Capacity	1,000,204,886,016 bytes	
	Height	1 in; 2.54 cm	
	Width	Media Diameter	3.5 in; 8.9 cm
		Physical Size	4 in; 10.17 cm
	Interface	Serial ATA (3.0 Gb/s), Native Command Queuing enabled	
	Synchronous Transfer Rate (Maximum)	Up to 300 MB/s	
	Buffer	32 MB	

Technical Specifications

500GB SATA 7200 rpm 3Gb/s 3.5" HDD	Seek Time (typical reads, includes controller overhead, including settling)	Single Track	2 ms
		Average	11 ms
		Full-Stroke	21 ms
	Rotational Speed	7,200 rpm	
	Logical Blocks	1,953,525,168	
	Operating Temperature	41° to 131° F (5° to 55° C)	
500GB SATA 7200 rpm 3Gb/s 3.5" HDD	Capacity	500,107,862,016 bytes	
	Height	1 in; 2.54 cm	
	Width	Media Diameter	3.5 in; 8.9 cm
		Physical Size	4 in; 10.17 cm
	Interface	Serial ATA (3.0 Gb/s), Native Command Queuing enabled	
	Synchronous Transfer Rate (Maximum)	300 MB/s	
	Buffer	16 MB	
	Seek Time (typical reads, includes controller overhead, including settling)	Single Track	2 ms
		Average	11 ms
		Full-Stroke	21 ms
	Rotational Speed	7,200 rpm	
	Logical Blocks	976,773,168	
Operating Temperature	41° to 131° F (5° to 55° C)		
320GB SATA 7200 rpm 3Gb/s 3.5" HDD	Capacity	320,072,933,376 bytes	
	Height	1 in; 2.54 cm	
	Width	Media Diameter	3.5 in; 8.9 cm
		Physical Size	4.0 in; 10.17 cm
	Interface	Serial ATA (3.0 Gb/s), Native Command Queuing enabled	
	Synchronous Transfer Rate (Maximum)	300 MB/s	
	Buffer	8 MB	
	Seek Time (typical reads, includes controller overhead, including settling)	Single Track	2 ms
		Average	12 ms
		Full-Stroke	21 ms
	Rotational Speed	7,200 rpm	
	Logical Blocks	625,142,448	
Operating Temperature	41° to 131° F (5° to 55° C)		
250GB SATA 7200 rpm 3Gb/s 3.5" HDD	Capacity	250,059,350,016 bytes	
	Height	1 in; 2.54 cm	
	Width	Media Diameter	3.5 in; 8.9 cm
		Physical Size	4.0 in; 10.17 cm
	Interface	Serial ATA (3.0 Gb/s), Native Command Queuing enabled	
	Synchronous Transfer Rate (Maximum)	300 MB/s	

Technical Specifications

	Buffer	8 MB	
	Seek Time (typical reads, includes controller overhead, including settling)	Single Track	2 ms
		Average	11 ms
		Full-Stroke	21 ms
	Rotational Speed	7,200 rpm	
	Logical Blocks	488,397,168	
	Operating Temperature	41° to 131° F (5° to 55° C)	
160GB SATA 7200 rpm 3Gb/s 3.5" HDD	Capacity	160,041,885,696 bytes	
	Height	1 in; 2.54 cm	
	Width	Media Diameter	3.5 in; 8.9 cm
		Physical Size	4 in; 10.2 cm
	Interface	Serial ATA (3.0 Gb/s), Native Command Queuing enabled	
	Synchronous Transfer Rate (Maximum)	300 MB/s	
	Buffer	8 MB	
	Seek Time (typical reads, includes controller overhead, including settling)	Single Track	2 ms
		Average	11 ms
		Full-Stroke	21 ms
	Rotational Speed	7,200 rpm	
	Logical Blocks	312,581,808	
	Operating Temperature	41° to 131° F (5° to 55° C)	
3.0TB SATA 7200 rpm 6Gb/s 3.5" HDD	Capacity	3.0TB	
	Height	1 in; 2.54 cm	
	Width	Media Diameter	3.5 in; 8.9 cm
		Physical Size	4.0 in; 10.17 cm
	Interface	Serial ATA (6.0Gb/s), NCQ enabled	
	Synchronous Transfer Rate (Maximum)	Up to 6.0 Gb/s	
	Buffer	64MB	
	Seek Time (typical reads, includes controller overhead, including settling)	Single Track	0.6 ms
		Average	11 ms
		Full-Stroke	Not specified
	Rotational Speed	7200 rpm	
	Operating Temperature	41° to 140° F (5° to 60° C)	
1TB SATA 7200 rpm 6Gb/s 3.5" HDD	Capacity	1 Terabyte (1000 GB)	
	Height	1 in; 2.54 cm	
	Width	Media Diameter	3.5 in; 8.9 cm
		Physical Size	4 in; 10.17 cm
	Interface	Serial ATA (6.0Gb/s), NCQ enabled	
	Synchronous Transfer Rate (Maximum)	Up to 600 MB/s	
	Buffer	32MB	

Technical Specifications

	Seek Time (typical reads, includes controller overhead, including settling)	Single Track	2 ms
		Average	11 ms
		Full-Stroke	21 ms
	Rotational Speed	7,200 rpm	
	Logical Blocks	1,953,525,168	
	Operating Temperature	41° to 131° F (5° to 55° C)	
500GB SATA 7200 rpm 6Gb/s 3.5" HDD	Capacity	500GB	
	Height	1 in; 2.54 cm	
	Width	Media Diameter	3.5 in; 8.9 cm
		Physical Size	4 in; 10.17 cm
	Interface	Serial ATA (6.0Gb/s), NCQ enabled	
	Synchronous Transfer Rate (Maximum)	Up to 600MB/s	
	Buffer	16MB	
	Seek Time (typical reads, includes controller overhead, including settling)	Single Track	2 ms
		Average	11 ms
		Full-Stroke	21 ms
	Rotational Speed	7,200 rpm	
	Logical Blocks	976,773,168	
	Operating Temperature	41° to 131° F (5° to 55° C)	
250GB SATA 7200 rpm 6Gb/s 3.5" HDD	Capacity	250 GB	
	Height	1 in; 2.54 cm	
	Width	Media Diameter	3.5 in; 8.9 cm
		Physical Size	4 in; 10.17 cm
	Interface	Serial ATA (6.0Gb/s), NCQ enabled	
	Synchronous Transfer Rate (Maximum)	Up to 600MB/s	
	Buffer	8 MB	
	Seek Time (typical reads, includes controller overhead, including settling)	Single Track	2 ms
		Average	11 ms
		Full-Stroke	21 ms
	Rotational Speed	7,200 rpm	
	Logical Blocks	488,397,168	
	Operating Temperature	41° to 131° F (5° to 55° C)	
2.0TB SATA 7200 rpm 6Gb/s 3.5" HDD	Capacity	2TB	
	Height	1 in; 2.54 cm	
	Width	Media Diameter	3.5 in; 8.9 cm
		Physical Size	4 in; 10.17 cm
	Interface	Serial ATA (6.0 Gb/s), NCQ Enabled	
	Synchronous Transfer Rate (Maximum)	Up to 600MB/s	
	Buffer	64MB	

Technical Specifications

HP 320GB SATA 7.2K SED SFF HDD	Seek Time (typical reads, includes controller overhead, including settling)	Single Track	1.0 ms
		Average	11 ms
		Full-Stroke	18 ms
	Rotational Speed	7,200 rpm	
	Logical Blocks	3,907,029,168	
	Operating Temperature	41° to 131° F (5° to 55° C)	
	Capacity	320GB	
	Height	0.275 in; 0.7 cm	
	Width	Media Diameter	2.5 in; 6.36 cm
		Physical Size	2.75 in; 7 cm
	Interface	Serial ATA (3.0Gb/s), NCQ enabled	
	Synchronous Transfer Rate (Maximum)	Up to 166MB/s	
	Buffer	16MB	
	Cache	16MB	
	Seek Time (typical reads, includes controller overhead, including settling)	Single Track	2.0ms (read) 2.2ms (write)
		Average	13ms
		Full-Stroke	30ms
	Rotational Speed	7,200 rpm	
	Logical Blocks	625,142,448	
	Operating Temperature	32° to 140° F (0° to 60° C)	

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