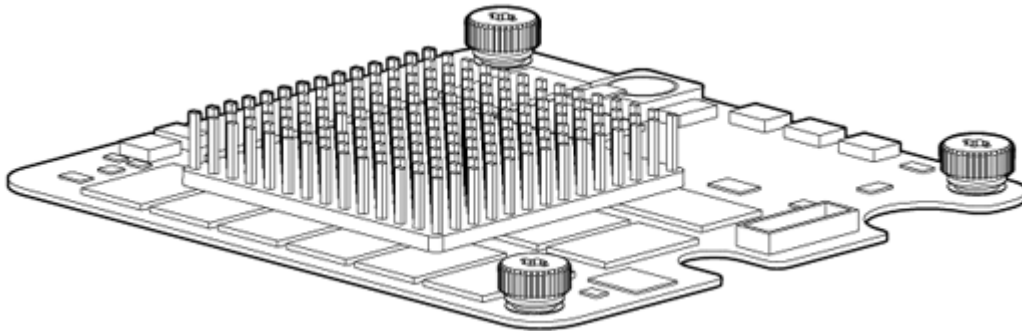


Overview

HP is introducing the IO Accelerator as part of a comprehensive solid state storage portfolio. This storage device is targeted for markets & applications requiring high transaction rates and real-time data access that will benefit from application performance enhancement. The HP IO Accelerator brings high random I/O performance and low latency access to storage, with the reliability of solid state technology and its low power and cooling requirements. This product, based on NAND Single Level Cell and Multi Level Cell flash technology (depending on capacity) is available in a mezzanine card form factor for HP BladeSystem c-Class.



What's New

Solid State Storage Technology can provide customer benefits in several different areas and with different architecture implementations. It offers high performance and reliability with no moving parts, low power and cooling requirements and improved environmental tolerance. Solid state storage technology has only recently become a popular topic in the market despite the fact that it has been used in some enterprise applications for a number of years, especially where the workloads benefit significantly from very low latency access, and application benefits exceed the costs associated with the solution.

Solid state storage technology benefits are best realized with latency-sensitive environments for both read- and write- intensive workloads. In addition, significant operational cost savings can be seen by the customer when this technology is applied to the right applications.

Some use cases are:

- Databases that historically were run in memory or across many disk spindles for performance reasons
- Seismic data processing
- Business Intelligence and Data mining
- Real-time financial data processing and verification
- Content caching for near-static data for file/web servers
- 3D animation/rendering
- CAD/CAM
- Virtual Desktop Infrastructure solution
- Hypervisor running a large number of virtual machines

Solid state technology can be implemented in various ways within a server. The two most common implementations are as an SSD (in a SATA or SAS form factor) or as an I/O card attached to the PCI Express bus.

As an I/O card, the IO Accelerator is not a typical SSD; rather it is attached directly to the server's PCI Express fabric to offer extremely low latency and high bandwidth. The card is also designed to offer high IOPs (I/O Operations Per Second) and nearly symmetric read/write performance. The IO Accelerator uses a dedicated PCI Express x4 link with nearly 800MB/s of usable bandwidth. Each mezzanine slot in the c-Class BladeSystem offers at least that amount of bandwidth, so by combining cards, you can easily scale the storage to match your application's bandwidth needs.

Overview

The HP IO Accelerator's driver and firmware provide a block-storage interface to the operating system that can easily be used in the place of legacy disk storage. The storage can be used as a raw disk device, or it can be partitioned and formatted with standard file systems. You can also combine multiple cards using OS RAID (up to 3 with a full-height c-Class blade server) for increased reliability, capacity or performance in a single blade server.

A unique feature of the IO Accelerator is the ability for the customer to format it with a lower-than-stated capacity in order to achieve even greater sustained write performance. For instance, an 80GB drive could be formatted as a 40GB drive using the low-level fio-format tool. This will give improved write performance for some applications. Each customer's results may vary.

The HP IO Accelerator mezzanine card differs from other c-Class mezzanine cards in that it does not connect to any c-Class Interconnect Module. This allows the use of the IO Accelerator in any open mezzanine slot in a c-Class chassis regardless of what types of Interconnect Modules might be installed.

Models

HP StorageWorks 80GB IO Accelerator for BladeSystem c-Class	AJ876A
HP StorageWorks 160GB IO Accelerator for BladeSystem c-Class	AJ877A
HP StorageWorks 320GB IO Accelerator for BladeSystem c-Class	AJ878A

Standard Features

NOTE: For a brief, printer friendly data sheet that describes this product and informs you of the essential capabilities and specifications, please visit: www.hp.com

What is an IO Accelerator? The IO Accelerator is an advanced storage device that uses solid state storage technology directly on the PCI bus, assuring high read and write data rates and accelerated application performance. The associated application performance improvements will have a positive impact on business results and the ability to make decisions quickly, resulting in significant cost and time savings.

Single Level Cell and Multilevel Cell NAND technology uses flash memory cells to store data. Single level Cell (SLC) stores one bit per cell, while Multi-level Cell (MLC) uses two bits per cell. While MLC can store more data within each device, it has lower endurance characteristics than SLC.

IO and Read/Write Performance HP StorageWorks IO Accelerator offers superior IO performance (up to 100,000 IOPs), and high read (up to 700MB/s) and write (up to 600 MB/s) performance with SLC models.

Latency HP StorageWorks IO Accelerator offers very low latency access to data (as low as 50 microseconds to read a 4K block), in other words a virtually zero seek time compared to rotating magnetic media.

Supported ProLiant server blades BL460c G1 , BL480c G1
G5 Servers: All G5 Servers: [or list them: BL260c G5, BL2x220c G5, BL460c G5, BL465c G5, BL680c G5, BL685c G5, BL495c G5]
G6 Servers: All G6 Servers [or list them BL280c G6, BL460c G6, BL465c G6, BL685c G6, BL490c G6, BL495c G6]

RAM Requirements The amount of free RAM required by the driver depends on the size of the blocks used when writing to the drive. The smaller the blocks, the more RAM required. Here are the guidelines for each 80GB of storage:

Average Block Size(bytes)	RAM usage (Megabytes)
8,192	400
4,096	800
2,048	1,500
1,024	2,900
512	5,600

Manageability Command Line (CLI) tools for both Linux and Windows to configure, monitor, and upgrade firmware
SNMP Agent and System Management Homepage provided for Linux and Windows
ioManager GUI for Windows and Linux

Standard Features

PCI IDs	Vendor & Device ID 1AED:1003; Subsystem Vendor & Device ID 103C:324D
Upgradability	The IO Accelerator's controller can be upgraded in the future with new firmware. Online firmware update tools are available for all supported operating systems.
Wear-leveling	Projected lifetime of the NAND storage due to wear-out exceeds 15 years for all devices, based on a 5TB write & erase per day usage model.
Data Integrity	Using advanced ECC techniques, the IO Accelerator can correct up to 11 bits out of every 240 bytes, with a design target of a 1 in 10 to the 20 th Power probability of uncorrectable data and a 1 in 10 to the 30 th Power probability of undetected bad data.
OS Support	RHEL 4,5 (64-bit support only); SLES 10, 11* (64-bit support only) Windows Server x86-64 2003, 2008 (64-bit support only) The IO Accelerator is currently not supported as a boot device. * SLES 11 is available Q4 2009
Configurations	Mixing of capacities is allowed, OS RAID Up to 2 cards in Half-Height blades, 3 in Full-Height blades
Support	3/0/0 warranty; Customer Self Repair (CSR)

Service and Support, HP Care Pack, and Warranty Information

Support Services

Care Pack services provide a range of life cycle support options that let you choose the service levels that meet your business requirements, from basic to mission-critical.

A full range of HP Care Pack hardware and software services are available including:

- Installation and start up
- Educational courses
- Extended onsite hardware coverage hours from same business day 13 hours x 5 days or 24 hours x 7 days call window with options including 4-hour response or 6-hour Call-To-Repair.
- Comprehensive range of software technical support to deliver high level of application availability. Response times ranging from 30 minutes for critical problems to 2 hours.
- System Management, Performance Services and Mission Critical Support Solution

NOTE: For more information on HP Care Pack services, contact any of our worldwide sales offices or resellers or visit our worldwide Web site on the internet at: <http://www.hp.com/hps/carepack>

NOTE: For more complete information on HP Services offerings, customers and resellers, please visit us at: <http://www.hp.com/hps>

NOTE: Additional information regarding worldwide limited warranty and technical support is available at: <http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html>

Technical Specifications

HP StorageWorks 80 GB IO Accelerator for BladeSystem c-Class AJ876A	Usable Capacity	80 GB		
	Technology	NAND Flash, SLC		
	Length x Width x Height	Imperial:	Width	4.460"
			Length	3.970"
			Height	0.543"
	Metric:	Width	11.33 cm	
		Length	10.08 cm	
		Height	1.38 cm	
	Form factor	Type 1 c-Class Mezzanine		
	Bus Interface	PCI Express Gen-1 x4		
Power (Nominal)	7.5 watts (70% read / 30% write ratio)			
Operating Temperature	0° to 60° C			

HP StorageWorks 160 GB IO Accelerator for BladeSystem c-Class AJ877A	Usable Capacity	160 GB		
	Technology	NAND Flash, SLC		
	Length x Width x Height	Imperial:	Width	4.460"
			Length	3.970"
			Height	0.543"
	Metric:	Width	11.33 cm	
		Length	10.08 cm	
		Height	1.38 cm	
	Form factor	Type 1 c-Class Mezzanine		
	Bus Interface	PCI Express Gen-1 x4		
Power (Nominal)	7.5 watts (70% read / 30% write ratio)			
Operating Temperature	0° to 60° C			

HP StorageWorks 320 GB IO Accelerator for BladeSystem c-Class AJ878A	Usable Capacity	320 GB		
	Technology	NAND Flash, MLC		
	Length x Width x Height	Imperial:	Width	4.460"
			Length	3.970"
			Height	0.543"
	Metric:	Width	11.33 cm	
		Length	10.08 cm	
		Height	1.38 cm	
	Form factor	Type 1 c-Class Mezzanine		
	Bus Interface	PCI Express Gen-1 x4		
Power (Nominal)	7.5 watts (70% read / 30% write ratio)			
Operating Temperature	0° to 60° C			

Technical Specifications

Environment-friendly Products and Approach

End-of-life Management and Recycling

Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: <http://www.hp.com/go/green>. To recycle your product, please go to: <http://www.hp.com/go/green> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner. The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: <http://www.hp.com/go/green>. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

© Copyright 2009 Hewlett-Packard Development Company, L.P.

The information contained herein is subject to change without notice.

Microsoft and Windows NT are US registered trademarks of Microsoft Corporation.

The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

For hard drives, 1GB = 1 billion bytes. Actual formatted capacity is less.