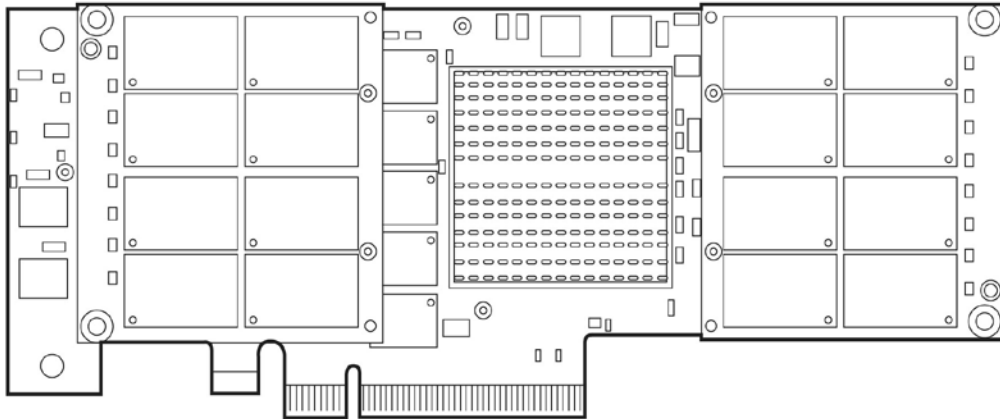


Overview

HPE PCIe Workload Accelerators for ProLiant Servers

Could your data center benefit from PCIe workload acceleration based on NAND Flash solid-state storage technology? HPE PCIe Workload Accelerators for ProLiant ML/DL/SL Servers are PCIe card-based direct-attach solutions offering amazing performance with low latency and enterprise reliability.



PCIe Workload Accelerators HH/HL

What's New

- HPE 6.4TB, 3.2TB, 1.6TB, 1.3TB Read Intensive-2 PCIe Workload Accelerators.

Models

HPE PCIe Workload Read Intensive (RI) PCIe Workload Accelerators

Accelerator Options HPE 6.4TB Read Intensive-2 FH/HL PCIe Workload Accelerator	831739-B21
HP 6.4TB FH/HL Value Endurance (VE) PCIe Workload Accelerator	763840-B21
HPE 3.2TB Read Intensive-2 HH/HL PCIe Workload Accelerator	831737-B21
HP 3.2TB HH/HL Value Endurance (VE) PCIe Workload Accelerator	763838-B21
HPE 1.6TB Read Intensive-2 HH/HL PCIe Workload Accelerator	831735-B21
HP 1.6TB HH/HL Value Endurance (VE) PCIe Workload Accelerator	763836-B21
HP 1.6TB Read Intensive Mezzanine PCIe Workload Accelerator for BladeSystem c-Class	794605-B21
HP 1.3TB HH/HL Value Endurance (VE) PCIe Workload Accelerator	763834-B21
HPE 1.3TB Read Intensive-2 HH/HL PCIe Workload Accelerator	831733-B21
HP 1.2TB Read Intensive Mezzanine PCIe Workload Accelerator for BladeSystem c-Class	794603-B21

Mixed Use (MU) PCIe Workload Accelerators

HP 5.2TB FH/HL Light Endurance (LE) PCIe Workload Accelerator	775672-B21
HP 2.6TB HH/HL Light Endurance (LE) PCIe Workload Accelerator	775670-B21
HP 2.0TB NVMe Mixed Use HH/HL PCIe Workload Accelerator	803204-B21
HP 1.6TB NVMe Mixed Use HH/HL PCIe Workload Accelerator	803202-B21
HP 1.4TB HH/HL Mainstream Endurance (ME) PCIe Workload Accelerator	729307-B21

Overview

HP 1.3TB HH/HL Light Endurance (LE) PCIe Workload Accelerator	775668-B21
HP 1.0TB HH/HL Light Endurance (LE) PCIe Workload Accelerator	775666-B21
HP 800GB NVMe Mixed Use HH/HL PCIe Workload Accelerator	803200-B21
HP 700GB HH/HL Mainstream Endurance (ME) PCIe Workload Accelerator	729305-B21
Write Intensive (WI) PCIe Workload Accelerators	
HP 1.6TB NVMe Write Intensive HH/HL PCIe Workload Accelerator	803197-B21
HP 800GB NVMe Write Intensive HH/HL PCIe Workload Accelerator	803195-B21
HP 700GB HH/HL High Endurance (HE) PCIe Workload Accelerator	708090-B21
HP 350GB HH/HL High Endurance (HE) PCIe Workload Accelerator	708088-B21

Standard Features

Compatibility **NOTE:** Please see the **PCIe Workload Accelerator Datasheet** for compatibility and OS support

What is a PCIe Workload Accelerator? The HPE PCIe Workload Accelerators are PCIe card-based, advanced storage devices that use 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 accelerate IO-bound workloads like databases, virtualization and data analytics, 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 HPE PCIe Workload Accelerators offer superior IO and high throughput.

Latency HPE PCIe Workload Accelerators offer very low latency access to data with virtually zero seek time compared to rotating magnetic media.

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 100GB of storage:

Average Block Size (bytes)	System RAM usage (Megabytes) per 100GB of storage for Driver version 2.x and 3.x
8,192	280MB
4,096 (most common)	530MB
2,048	1030MB
1,024	2,000MB
512	3,970MB

Manageability Command Line (CLI) tools for both Linux and Windows to configure, monitor, and upgrade firmware. RealSSD Manager GUI for Windows and Linux.

PCI IDs Vendor & Device IDs 1344:5150, 1344:5160, 8086:0953
Subsystem Vendor & Device IDs 1590:D082, 1590:D083, 1590:0097, 1590:D098, 1590:00BB, 1590:00BC, 1590:00BD, 1590:00BE, 1590:00BF

Upgradeability The controller for the HPE PCIe Workload Accelerators can be upgraded in the future with new firmware. Online firmware update tools are available for all supported operating systems.

Wear-leveling NAND Flash devices use semiconductor technology that has a finite amount of data that can be written to the device, defined as the Maximum Usage Limit. Projected lifetime of the NAND storage due to wear-out varies with type of NAND and amount of writes to the device.

Maximum usage **HPE Read Intensive (RI) Mezzanine PCIe Workload Accelerators**

HPE 1.2TB RI Mezzanine PCIe Wrkld Accelerator	HPE 1.6TB RI Mezzanine PCIe Wrkld Accelerator
1.2 TB	1.6 TB
0.6 Drive Writes/Day	0.6 Drive Writes/Day
1.3 PB written	1.8 PB written

HPE NVMe Mixed Use (MU) PCIe Workload Accelerators

Standard Features

HPE 800GB NVMe MU PCIe Wrkld Accelerator	HPE 1.6TB NVMe MU PCIe Wrkld Accelerator
800 GB	1.6 TB
3 Drive Writes/Day	3 Drive Writes/Day
4.8 PB written	8.8 PB written

HPE 2.0TB NVMe MU PCIe Wrkld Accelerator
2.0 TB
3 Drive Writes/Day
11.0 PB written

HPE NVMe Write Intensive (WI) PCIe Workload Accelerators

HPE 800GB NVMe WI PCIe Wrkld Accelerator	HPE 1.6TB NVMe WI PCIe Wrkld Accelerator
800 GB	1.6 TB
10 Drive Writes/Day	10 Drive Writes/Day
14.6 PB written	29.2 PB written

HPE Read Intensive (RI) PCIe Workload Accelerators

HPE 1.3TB RI-2 HH PCIe Accelerator	HPE 1.6TB RI-2 HH PCIe Accelerator
1.3 TB	1.6 TB
0.6 Drive Writes/Day	0.6 Drive Writes/Day
1.3 PB written	1.8 PB written

HPE 1.3TB VE PCIe Wrkld Accelerator	HPE 1.6TB VE PCIe Wrkld Accelerator
1.3 TB	1.6 TB
0.5 Drive Writes/Day	0.5 Drive Writes/Day
1.1 PB written	1.6 PB written

HPE 3.2TB RI-2 HH PCIe Accelerator	HPE 6.4TB RI-2 FH PCIe Accelerator
3.2 TB	6.4 TB
0.6 Drive Writes/Day	0.6 Drive Writes/Day
3.6 PB written	7.3 PB written

HPE 3.2TB VE PCIe Wrkld Accelerator	HPE 6.4TB VE PCIe Wrkld Accelerator
3.2 TB	6.4 TB
0.5 Drive Writes/Day	0.5 Drive Writes/Day
3.1 PB written	6.3 PB written

HPE Mixed Use (MU) PCIe Workload Accelerators

HPE 700GB ME PCIe Workload Accelerator	HPE 1.0TB LE PCIe Wrkld Accelerator
700 GB	1.0 TB
3.9 Drive Writes/Day	3 Drive Writes/Day
5 PB written	5.5 PB written

HPE 1.3TB ME PCIe Wrkld Accelerator	HPE 1.4TB ME PCIe Workload Accelerator
1.3 TB	1.4TB
3 Drive Writes/Day	3.9 Drive Writes/Day
7 PB written	10 PB written

Standard Features

HPE 1.4TB ME PCIe Workload Accelerator
 1.4TB
 3.9 Drive Writes/Day
 10 PB written

HPE 2.6 TB ME PCIe Wrkld Accelerator
 2.6 TB
 3 Drive Writes/Day
 14 PB written

HPE 5.2 TB ME PCIe Wrkld Accelerator
 5.2 TB
 3 Drive Writes/Day
 28 PB written

HPE Write Intensive (WI) PCIe Workload Accelerators

HPE 350GB HE PCIe Workload Accelerator
 350 GB
 39 Drive Writes/Day
 25 PB written

HPE 700GB HE PCIe Workload Accelerator
 700 GB
 39 Drive Writes/Day
 50 PB written

NOTE: Subject to Maximum Usage Limit - This is the maximum amount of data that can be written to the device before write burn-out. Drive writes per day (DWPD) is the maximum number of 4K host writes to the entire drive capacity per day over a five year period.

Data Integrity

Using advanced ECC techniques, the HPE PCIe Workload Accelerators can correct up to 16 bits out of every 1024 bytes, with a design target of 1 sector in 10 to the 17th Power bits read probability of uncorrectable data.

Product Category

Workloads Requiring Best Latency and Write Performance Including: Database, Business Intelligence, OLTP, VDI, etc.	Workloads Requiring Best Latency and Read Performance Including: Web Scale, Cloud Environments, Database, OLTP, Web Servers, etc.	
HPE PCIe Workload Accelerators		
PCIe Add-In	PCIe Add-In	PCIe Add-In or Mezzanine
<ul style="list-style-type: none"> • Best Latency • High Write Performance • Endurance >=10 DWPD 	<ul style="list-style-type: none"> • Best Latency • Balanced R/W Performance • Endurance >1 and <10 DWPD 	<ul style="list-style-type: none"> • Best Latency • Focused on Read Performance • Endurance <=1 DWPD
Write Intensive	Mixed Use	Read Intensive

Configurations

Mixing of capacities is allowed, OS RAID

Warranty

3/0/0 warranty; Customer Self Repair (CSR) Subject to maximum usage limitations (Please see note under Additional Services Information).

Service and Support

Service and Support HPE Technology Services

HPE Technology Services delivers confidence, reduces risk and helps customers realize agility and stability powered by a rich portfolio of consulting and support services designed to add value to our core products and solutions Connect to Hewlett Packard Enterprise to help prevent problems and solve issues faster. Our support technology lets you to tap into the knowledge of millions of devices and thousands of experts to stay informed and in control, anywhere, any time.

Protect your business beyond warranty with HPE Support Services

HPE Support Services offer complete care and support expertise with committed response choices that are designed to meet your IT and business needs.

Recommended Service

Recommended HPE Support Services for optimal satisfaction with your HPE product Foundation Care 24x7, three-year Support Service

HPE Foundation Care 24x7 connects you to Hewlett Packard Enterprise 24 hours a day, seven days a week for assistance on resolving issues. Hardware onsite response within four hours if needed; collaborative software included in this Support service provides troubleshooting assistance on industry leading software running on your HPE server. Simplify your support experience and make Hewlett Packard Enterprise your first call for hardware or software questions.

<http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=4AA4-8876ENW&cc=us&lc=en>

Related Services

HPE Installation of ProLiant Add On Options Service

This easy-to-buy, easy-to-use HPE Support Services helps ensure that your new HPE hardware or software is installed smoothly, efficiently, and with minimal disruption of your IT and business operations.

HPE Support Center Personalized online support portal with access to information, tools and experts to support HPE business products. Submit support cases online, chat with Hewlett Packard Enterprise experts, access support resources or collaborate with peers. Learn more **<http://www.hp.com/go/hpsc>**

HPE's Support Center Mobile App allows you to resolve issues yourself or quickly connect to an agent for live support. Now, you can get access to personalized IT support anywhere, anytime.

HPE Insight Remote Support and HPE Support Center are available at no additional cost with a Hewlett Packard Enterprise warranty, HPE Support Service or Hewlett Packard Enterprise contractual support agreement.

NOTE: HPE Support Center Mobile App is subject to local availability

Parts and materials Hewlett Packard Enterprise will provide HPE-supported replacement parts and materials necessary to maintain the covered hardware product in operating condition, including parts and materials for available and recommended engineering improvements.

Parts and components that have reached their maximum supported lifetime and/or the maximum usage limitations as set forth in the manufacturer's operating manual, product quick-specs, or the technical product data sheet will not be provided, repaired, or replaced as part of these services.

The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by Hewlett Packard Enterprise due to malfunction.

For more information

The PCIe Workload Accelerators require the purchase of support services separate from the server's in order to receive support services beyond warranty. For a list of PCIe Workload Accelerator support service packs, please visit **hp.com/go/cpc**

Technical Specifications

HPE Mezzanine PCIe Workload Accelerators

NOTE: Mezz form factor for compatibility only to ProLiant Blades. Random Performance is based on a 4KiB transfer size at a queue of 16 and max performance is shown at various queue depths.

Read Intensive (RI) PCIe Workload Accelerators

HPE 1.6TB Read Intensive Mezzanine PCIe Workload Accelerator for BladeSystem c-Class 794605-B21	Usable Capacity	1.6 TB
	Technology	NAND Flash
	Max Sequential Throughput	Reads 2,400 MiB/s, Writes 1,500 MiB/s
	Access Latency (4KiB,Q1)	Reads 117 microseconds Writes 27 microseconds
	IOPS (4KiB,Q16)	Read 83,000 IOPS Write 83,000 IOPS
	Max Random IOPS (4KiB)	Read 190,000 IOPS @ Q64 Write 83,000 IOPS @ Q16
	Form factor	Mezz
	Bus Interface	-
	Power (Nominal)	25W

HPE 1.2TB Read Intensive Mezzanine PCIe Workload Accelerator for BladeSystem c-Class 794603-B21	Usable Capacity	1.2 TB
	Technology	NAND Flash
	Max Sequential Throughput	Reads 2,200 MiB/s Writes 1,300 MiB/s
	Access Latency (4KiB,Q1)	Reads 115 microseconds, Writes 28 microseconds
	IOPS (4KiB,Q16)	Read 81,000 IOPS 83,000 Write IOPS
	Max Random IOPS (4KiB)	Read 165,000 IOPS @ Q64 Write 83,000 IOPS @ Q16
	Form factor	Mezz
	Bus Interface	-
	Power (Nominal)	25W

HPE NVMe PCIe Workload Accelerators

NOTE: Random Performance is based on a 4KiB transfer size at a queue of 16 and max performance is shown at various queue depths. Please note that the NVMe accelerators ship with both full height and half height brackets included in the box.

Mixed Use (MU) PCIe Workload Accelerators

HPE 2.0TB NVMe Mixed Use HH/HL PCIe Workload Accelerator	Usable Capacity	2.0 TB
	Technology	NAND Flash
	Max Sequential Throughput	Reads 2,575 MiB/s Writes 1,625 MiB/s

Technical Specifications

803204-B21	Access Latency (4KiB,Q1)	Reads 95 microseconds Writes 21 microseconds
	IOPS (4KiB,Q16)	Read 150,000 IOPS, Write 64,000 IOPS
	Max Random IOPS (4KiB)	Read 465,000 IOPS @ Q128 Write 64,000 IOPS @ Q4
	Form factor	Half Height/Half length
	Bus Interface	PCIe Gen3 x4
	Power (Nominal)	25W

HPE 1.6TB NVMe Mixed Use HH/HL PCIe Workload Accelerator 803202-B21	Usable Capacity	1.6 TB
	Technology	NAND Flash
	Max Sequential Throughput	Reads 2,500 MiB/s Writes 1,400 MiB/s
	Access Latency (4KiB,Q1)	Reads 95 microseconds Writes 21 microseconds
	IOPS (4KiB,Q16)	Read 135,000 IOPS Write 66,000 IOPS
	Max Random IOPS (4KiB)	Read 465,000 IOPS @ Q128 Write 66,000 IOPS @ Q4
	Form factor	Half Height/Half length
	Bus Interface	PCIe Gen3 x4
Power (Nominal)	25W	

HPE 800GB NVMe Mixed Use HH/HL PCIe Workload Accelerator 803200-B21	Usable Capacity	800 GB
	Technology	NAND Flash
	Max Sequential Throughput	Reads 2,450 MiB/s Writes 880 MiB/s
	Access Latency (4KiB,Q1)	Reads 100 microseconds Writes 22 microseconds
	IOPS (4KiB,Q16)	Read 140,000 IOPS Write 54,000 IOPS
	Max Random IOPS (4KiB)	Read 450,000 IOPS @ Q128 Write 54,000 IOPS @ Q4
	Form factor	Half Height/Half length
	Bus Interface	PCIe Gen3 x4
Power (Nominal)	25W	

Write Intensive (WI) PCIe Workload Accelerators

NOTE: Random Performance is based on a 4KiB transfer size at a queue of 16 and max performance is shown at various queue depths.

HPE 1.6TB NVMe	Usable Capacity	1.6 TB
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Technical Specifications

Write Intensive HH/HL I1 PCIe Workload Accelerator 803197-B21	Technology	NAND Flash
	Max Sequential Throughput	Reads 2,600 MiB/s Writes 1,700 MiB/s
	Access Latency (4KiB,Q1)	Reads 95 microseconds Writes 17 microseconds
	IOPS (4KiB,Q16)	Read 150,000 IOPS Write 152,000 IOPS
	Max Random IOPS (4KiB)	Read 474,000 IOPS @ Q128 Write 152,000 IOPS @ Q16
	Form factor	Half Height/Half length
	Bus Interface	PCIe Gen3 x4
	Power (Nominal)	25W

HPE 800GB NVMe Write Intensive HH/HL I1 PCIe Workload Accelerator 803195-B21	Usable Capacity	800 GB
	Technology	NAND Flash
	Max Sequential Throughput	Reads 2,600 MiB/s Writes 1,700 MiB/s
	Access Latency (4KiB,Q1)	Reads 92 microseconds Writes 22 microseconds
	IOPS (4KiB,Q16)	Read 160,000 IOPS Write 99,000 IOPS
	Max Random IOPS (4KiB)	Read 474,000 IOPS @ Q128 Write 99,000 IOPS @ Q4
	Form factor	Half Height/Half length
	Bus Interface	PCIe Gen3 x4
Power (Nominal)	25W	

HPE PCIe Workload Accelerators

NOTE: Random Performance is based on a 4KiB transfer size at a queue of 16. Max performance is shown below at various queue depths.

Read Intensive (RI) PCIe Workload Accelerators

HPE 6.4TB Read Intensive-2 FH/HL PCIe Workload Accelerator 831739-B21	Usable Capacity	6.4 TB
	Technology	NAND Flash
	Max Sequential Throughput	Reads 2.1 GiB/s, Writes 1.6 GiB/s
	Access Latency (4KiB,Q1)	Reads 95 microseconds, Writes 21 microseconds
	IOPS (4KiB,Q16)	Read 71,500 IOPS, Write 78,500 IOPS
	Max Random IOPS (4KiB)	Read 245,000 IOPS @ Q256 Write 78,500 IOPS @ Q16
Form factor	Full Height/Half length	

Technical Specifications

	Bus Interface	PCIe 2.0 X 8
	Power (Nominal)	21W
HPE 6.4TB FH/HL Value Endurance (VE) PCIe Workload Accelerator 763840-B21	Usable Capacity	6.4 TB
	Technology	NAND Flash
	Max Sequential Throughput	Reads 1.7 GiB/s, Writes .965 GiB/s
	Access Latency (4KiB,Q1)	Reads 400 microseconds, Writes 45 microseconds
	IOPS (4KiB,Q16)	Read 44,000 IOPS Write 53,000 IOPS
	Max Random IOPS (4KiB)	Read 200,000 IOPS @ Q128 Write 86,000 IOPS @ Q16
	Form factor	Full Height/Half length
	Bus Interface	PCIe 2.0 X 8
	Power (Nominal)	21W

HPE 3.2TB Read Intensive-2 HH/HL PCIe Workload Accelerator 831737-B21	Usable Capacity	3.2TB
	Technology	NAND Flash
	Max Sequential Throughput	Reads 2.5 GiB/s, Writes 1.75 GiB/s
	Access Latency (4KiB,Q1)	Reads 100 microseconds Writes 22 microseconds
	IOPS (4KiB,Q16)	Read 86,000 IOPS Write 115,000 IOPS
	Max Random IOPS (4KiB)	Read 245,000 IOPS @ Q256 Write 125,000 IOPS @ Q64
	Form factor	Half Height/Half length
	Bus Interface	PCIe 2.0 X 8
	Power (Nominal)	21W

HPE 3.2TB HH/HL Value Endurance (VE) PCIe Workload Accelerator 763838-B21	Usable Capacity	3.2 TB
	Technology	NAND Flash
	Max Sequential Throughput	Reads 2 GiB/s Writes .980 GiB/s
	Access Latency (4KiB,Q1)	Reads 400 microseconds Writes 35 microseconds
	IOPS (4KiB,Q16)	Read 46,000 IOPS 59,000 Write IOPS
	Max Random IOPS (4KiB)	Read 200,000 IOPS @ Q128 Write 86,000 IOPS @ Q16
	Form factor	Half Height/Half length

Technical Specifications

	Bus Interface	PCIe 2.0 X 8
	Power (Nominal)	21W
HPE 1.6TB Read Intensive-2 HH/HL PCIe Workload Accelerator 831735-B21	Usable Capacity	1.6TB
	Technology	NAND Flash
	Max Sequential Throughput	Reads 2.55 GiB/s Writes 1.4 GiB/s
	Access Latency (4KiB,Q1)	Reads 95 microseconds Writes 23 microseconds
	IOPS (4KiB,Q16)	Read 98,000 IOPS Write 112,000 IOPS
	Max Random IOPS (4KiB)	Read 205,000 IOPS @ Q256 Write 115,000 IOPS @ Q32
	Form factor	Half Height/Half length
	Bus Interface	PCIe 2.0 X 8
	Power (Nominal)	21W

HPE 1.6TB HH/HL Value Endurance (VE) PCIe Workload Accelerator 763836-B21	Usable Capacity	1.6 TB
	Technology	NAND Flash
	Max Sequential Throughput	Reads 2.6 GiB/s Writes 1GiB/s
	Access Latency (4KiB,Q1)	Reads 110 microseconds Writes 30 microseconds
	IOPS (4KiB,Q16)	Read 68,000 IOPS Write 62,000 IOPS
	Max Random IOPS (4KiB)	Read 190,000 IOPS @ Q64 Write 84,000 IOPS @ Q16
	Form factor	Half Height/Half length
	Bus Interface	PCIe 2.0 X 8
	Power (Nominal)	21W

HPE 1.3TB Read Intensive-2 HH/HL PCIe Workload Accelerator 831733-B21	Usable Capacity	1.3TB
	Technology	NAND Flash
	Max Sequential Throughput	Reads 2.15 GiB/s Writes 1.3 GiB/s
	Access Latency (4KiB,Q1)	Reads 95 microseconds Writes 23 microseconds
	IOPS (4KiB,Q16)	Read 95,000 IOPS Write 105,000 IOPS
	Max Random IOPS (4KiB)	Read 175,000 IOPS @ Q256 Write 105,000 IOPS @ Q16

Technical Specifications

Form factor	Half Height/Half length
Bus Interface	PCIe 2.0 X 8
Power (Nominal)	21W

HPE 1.3TB HH/HL Value Endurance (VE) PCIe Workload Accelerator 763834-B21	Usable Capacity	1.3 TB
	Technology	NAND Flash
	Max Sequential Throughput	Reads 2.2 GiB/s Writes 1.18 GiB/s
	Access Latency (4KiB,Q1)	Reads 115 microseconds Writes 30 microseconds
	IOPS (4KiB,Q16)	Read 66,000 IOPS Write 69,000 IOPS
	Max Random IOPS (4KiB)	Read 165,000 IOPS @ Q64 Write 84,000 IOPS @ Q16
	Form factor	Half Height/Half length
	Bus Interface	PCIe 2.0 X 8
	Power (Nominal)	21W

Mixed Use (MU) PCIe Workload Accelerators

NOTE: Random Performance is based on a 4KiB transfer size at a queue of 16 and max performance is shown at various queue depths.

HPE 5.2TB FH/HL Light Endurance (LE) PCIe Workload Accelerator 775672-B21	Usable Capacity	5.2 TB
	Technology	NAND Flash
	Max Sequential Throughput	Reads 2 GiB/s, Writes 1.2 GiB/s
	Access Latency (4KiB,Q1)	Reads 110 microseconds Writes 25 microseconds
	IOPS (4KiB,Q16)	Read 56,000 IOPS Write 138,000 IOPS
	Max Random IOPS (4KiB)	Read 184,000 IOPS @ Q128 Write 133,000 IOPS @ Q16
	Form factor	Full Height/Half length
	Bus Interface	PCIe 2.0 X 8
	Power (Nominal)	25W, enhanced performance at 35W

HPE 2.6TB HH/HL Light Endurance (LE) PCIe Workload Accelerator 775670-B21	Usable Capacity	2.6 TB
	Technology	NAND Flash
	Max Sequential Throughput	Reads 2.4 GiB/s, Writes 1.5 GiB/s
	Access Latency (4KiB,Q1)	Reads 110 microseconds, Writes 25 microseconds

Technical Specifications

IOPS (4KiB,Q16)	Read 69,000 IOPS, Write 150,000 IOPS
Max Random IOPS (4KiB)	Read 235,000 IOPS @ Q128 Write 168,000 IOPS @ Q16
Form factor	Half Height/Half length
Bus Interface	PCIe 2.0 X 8
Power (Nominal)	25W, enhanced performance at 35W

HPE 1.3TB HH/HL Light Endurance (LE) PCIe Workload Accelerator 775668-B21	Usable Capacity	1.3 TB
	Technology	NAND Flash
	Max Sequential Throughput	Reads 2.4 GiB/s Writes 1.4 GiB/s
	Access Latency (4KiB,Q1)	Reads 110 microseconds Writes 25 microseconds
	IOPS (4KiB,Q16)	Read 69,000 IOPS Write 135,000 IOPS
	Max Random IOPS (4KiB)	Read 150,000 IOPS @ Q128 Write 143,000 IOPS @ Q16
	Form factor	Half Height/Half length
Bus Interface	PCIe 2.0 X 8	
Power (Nominal)	25W	

HPE 1.0TB HH/HL Light Endurance (LE) PCIe Workload Accelerator 775666-B21	Usable Capacity	1.0 TB
	Technology	NAND Flash
	Max Sequential Throughput	Reads 2.2 GiB/s Writes 1.3 GiB/s
	Access Latency (4KiB,Q1)	Reads 110 microseconds Writes 25 microseconds
	IOPS (4KiB,Q16)	Read 67,000 IOPS Write 130,000 IOPS
	Max Random IOPS (4KiB)	Read 135,000 IOPS @ Q128 Write 155,000 IOPS @ Q16
	Form factor	Half Height/Half length
Bus Interface	PCIe 2.0 X 8	
Power (Nominal)	25W	

HPE 1.4TB Mainstream Endurance (ME) PCIe Workload Accelerator 729307-B21	Usable Capacity	1.4 TB
	Technology	NAND Flash
	Max Sequential Throughput	Reads 3.3 GiB/s Writes 615 MiB/s
	Access Latency (4KiB,Q1)	Reads 130 microseconds Writes 15 microseconds

Technical Specifications

IOPS (4KiB,Q16)	Read 120,000 IOPS Write 99,000 IOPS
Max Random IOPS (4KiB)	Read 760,000 IOPS @ Q256 Write 105,000 IOPS @ Q4
Form factor	Half Height/Half length Low profile PCI Express X8 slot (spec 2.0)
Bus Interface	PCI Express 2.0 x 8
Power (Nominal)	PCI Express x 8 (power spec 2.0)
Operating Temperature	0-50°C (Operational)/-40-55°C (non-operational)/at max TBW -40C-+40C (non-operational)
Supported Driver Version	SP138

NOTE: The HPE 1.4TB Mainstream Endurance PCIe Workload Accelerator can draw up to 30W power under peak workloads if power limiting is off. If power limiting is enabled on the 1.4TB drive, the maximum power consumed will be less than 25W.

HPE 700GB Mainstream Endurance (ME) PCIe Workload Accelerator 729305-B21	Usable Capacity	700 GB
	Technology	NAND Flash
	Max Sequential Throughput	Reads 3.3 GiB/s Writes 570 MiB/s
	Access Latency (4KiB,Q1)	Reads 110 microseconds Writes 15 microseconds
	IOPS (4KiB,Q16)	Read 120,000 IOPS Write 53,000 IOPS
	Max Random IOPS (4KiB)	Read 735,000 IOPS @ Q256 Write 55,000 IOPS @ Q1
	Form factor	Half Height/Half length Low profile PCI Express X8 slot (spec 2.0)
	Bus Interface	PCI Express 2.0 x 8
	Power (Nominal)	PCI Express x 8 (power spec 2.0)
	Operating Temperature	0-50°C (Operational)/-40-55°C (non-operational)/at max TBW -40C-+40C (non-operational)
Supported Driver Version	SP138	

Write Intensive (WI) PCIe Workload Accelerators

NOTE: Random Performance is based on a 4KiB transfer size at a queue of 16 and max performance is shown at various queue depths.

HPE 700GB High Endurance (HE) PCIe Workload Accelerator 708090-B21	Usable Capacity	700 GB
	Technology	NAND Flash
	Max Sequential Throughput	Reads 3.2 GiB/s Writes 1.8 GiB/s
	Access Latency (4KiB,Q1)	Reads 100 microseconds Writes 285 microseconds

Technical Specifications

IOPS (4KiB,Q16)	Read 160,000 IOPS Write 49,000 IOPS
Max Random IOPS (4KiB)	Read 775,000 IOPS @ Q256 Write 200,000 IOPS @ Q256
Form factor	Half Height/Half-length Low profile PCI Express X8 slot (spec 2.0)
Bus Interface	PCI Express 2.0 x 8
Power (Nominal)	PCI Express x 8 (power spec 2.0)
Operating Temperature	0-50°C (Operational)/-40-55°C (non-operational)/at max TBW -40C-+40C (non-operational)
Supported Driver Version	SP134 or later

HPE 350GB High Endurance (HE) PCIe Workload Accelerator 708088-B21	Usable Capacity	350 GB
	Technology	NAND Flash
	Max Sequential Throughput	Reads 3.2 GiB/s Writes 1.8 GiB/s
	Access Latency (4KiB,Q1)	Reads 100 microseconds Writes 285 microseconds
	IOPS (4KiB,Q16)	Read 160,000 IOPS Write 45,000 IOPS
	Max Random IOPS (4KiB)	Read 775,000 IOPS @ Q256 Write 90,000 IOPS @ Q128
	Form factor	Half Height/Half length Low profile PCI Express X8 slot (spec 2.0)
	Bus Interface	PCI Express 2.0 x 8
	Power (Nominal)	PCI Express 2.0 x 8
	Operating Temperature	0-50°C (Operational)/-40-55°C (non-operational)/at max TBW -40C - +40C (non-operational)
Supported Driver Version	SP134 or later	

Environment-friendly Products and Approach	End-of-life Management and Recycling	Hewlett Packard Enterprise offers end-of-life HPE 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 Hewlett Packard Enterprise sales office. Products returned to Hewlett Packard Enterprise 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 Enterprise web site at: http://www.hp.com/go/green . These instructions may be used by recyclers and other WEEE treatment facilities as well as Hewlett Packard Enterprise OEM customers who integrate and re-sell HPE equipment.
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Summary of Changes

Date	Version History	Action	Description of Change
01-Dec-2015	From Version 7 to 8	Changed	Overview, standard features, Service and Support, and Technical Specifications sections were updated.
		Added	SKUs added in Overview section: 831739-B21, 831737-B21, 831735-B21, 831733-B21.
12-Jun-2015	From Version 6 to 7	Changed	Information in Technical Specifications updated.
30-Mar-2015	From Version 5 to 6	Changed	Changes made throughout the QuickSpecs
6-Feb-2015	From Version 4 to 5	Changed	Standard Features section was updated.
10-Jun-2014	From Version 3 to 4	Changed	Changes made throughout the QuickSpecs.
30-Sep-2013	From Version 2 to 3	Added	Mainstream Endurance (ME) PCIe Workload Accelerators were added
15-May-2013	From Version 1 to 2	Changed	Made a Note change in the OS Support section.



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

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