Overview

HPE Solid State Disk Drives (SSD, AICs, M.2s and M.2 EKits)

HPE Solid State Drives (SSDs), Add-In-Cards, M.2s and M.2 Enablement Kits (EKits) are based upon industry leading NAND Flash technology, which delivers exceptional performance and endurance to support a growing broad spectrum of demanding applications with varying workload performance requirements.

These storage devices offer better I/O latency & more power efficient solutions when compared with traditional rotating (HDD) media, while also fitting seamlessly into existing HPE server & storage infrastructures, and are available in a number of form factors including: Small Form Factor (SFF), Large Form Factor (LFF), M.2, and PCIe/NVME Add-In-Cards (AIC).

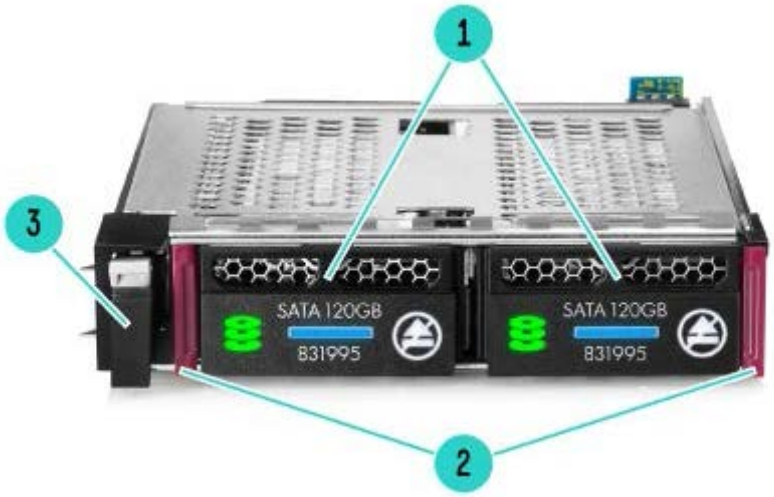
Overview

HPE M.2 Enablement Kits

M.2 Enablement Kit with Small Form Factor Flash Adapter with Dual uFF SSDs

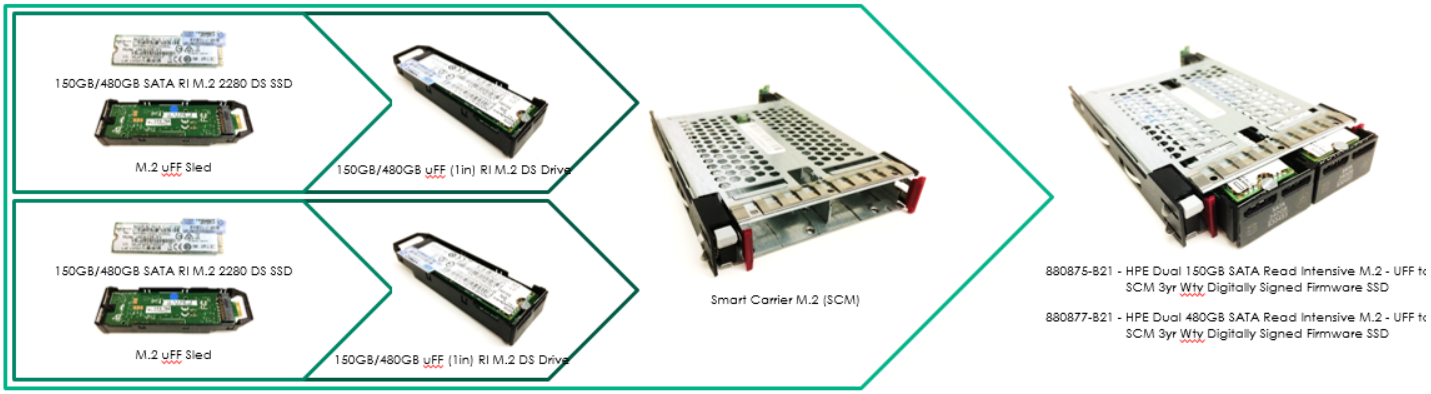
The HPE M.2 Enablement Kit is a Small Form Factor (SFF) Flash Adapter that packages two 6G SATA M.2 Micro Form Factor (uFF) Sleds in a Dual Domain SFF Smart Drive bay which enables customers to install twice as many drives in an HPE server module when compared to standard SFF Smart Drive bays.

The HPE M.2 Enablement Kit with Small Form Factor Flash Adapter with Dual uFF SSDs increases flexibility, availability and serviceability for storage resources inside the server. The M.2 Enablement Kit with Small Form Factor Flash Adapter with Dual uFF SSDs option increases the composability of the server by enabling configurations that support a broader range of applications and workloads by providing up to 2 drives (2 x HPE SFF Dual uFF SSD options) within 1 drive bay, for example for higher drive performance, or when an on-line spare drive is needed. When higher application availability is required, customers can separate RAID1 mirror boot drives from the application. DATA availability is increased by being able to configure a RAID5 set, which also means more usable capacity



Item Description

1) uFF SATA Drive Modules (hot pluggable)
2) uFF Drive Ejection Latches
3) Adapter Ejection Release Latch



Overview

What's New?

New Solid State Drives & Drive Kit(s):

New Option KIT SKUs

- 875579-B21 HPE 480GB NVMe x4 RI M.2 22110 DS SSD
- 875581-B21 HPE 960GB NVMe x4 RI M.2 22110 DS SSD
- 875583-B21 HPE 400GB NVMe x4 MU M.2 22110 DS SSD
- 875585-B21 HPE 800GB NVMe x4 MU M.2 22110 DS SSD
- 877831-B21 HPE 4TB PCIe x4 RI HH DS Card
- 877988-B21 HPE 4TB NVMe x4 RI SFF SCN DS SSD

HPE Recommended Options

HPE recommended options have best performance, value and availability.

Recommended
Offering the best combination of performance, value and availability, Recommended Options have been selected by HPE experts to provide the right technology for a range of workloads and market segments. Fully integrated into the ProLiant management and security experience, Recommended Options provide the best fit with timely availability.

Extended
Extended Options provide an extended catalog of products tailored for customers in specific markets or with specific workloads, requiring the utmost in performance or value. Fully integrated into the ProLiant management and security experience, Extended Options represent great value and performance but typically have a longer lead-time.

HPE Recommended Options – **View the list for your region**

Firmware Updates:

- HPE Digitally Signed Firmware – Prevents unauthorized access to your data by providing the security and assurance that drive firmware comes from a trusted source and protects against malicious attacks

- For advanced data protection and encryption, customers should consider HPE Smart Array Controllers with HPE Smart Array Secure SR Encryption. It is a controller-based data encryption solution for HPE servers that protects data-at-rest on all SAS and SATA drives connected directly to the controller. This solution meets stringent compliance regulations such as HIPAA, FIPS, and Sarbanes-Oxley.

HPE Selector Tool Enhancements:

HPE Solid-State Drive Selector Tool – a web-based tool that dramatically reduces the time and complexity of selecting the right SSD for your demanding workloads. **http://ssd.hpe.com/**

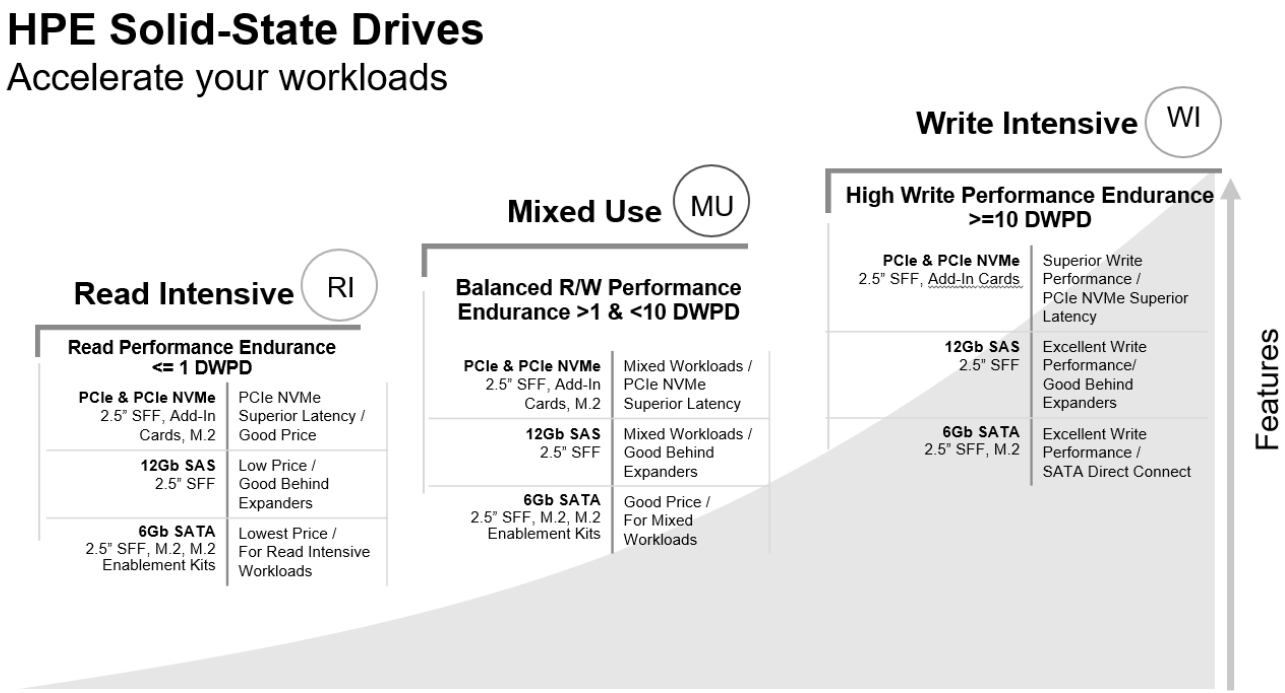
Overview

HPE SSD, AIC, M.2 and M.2 EKits Portfolio Overview

Figure 1 – SSD Dashboard

As noted in Figure 1 -SSD Dashboard below, HPE SSDs, AICs, M.2s and M.2 EKits are categorized by both interface and workloads.

There are three workload types - Read Intensive (RI), Mixed-Use (MU), and Write Intensive (WI); examples for each these workloads are provided in Figure 2 – SSD 3x3 Selection Grid.



NOTE:

**DWPD (Drive Writes Per Day): Full drive writes per day 5 years. Based on 100% Random Writes (4KiB)

**HPE Enterprise SSDs deliver: Full data path detection power loss protection and Smart SSD Wear Gauge support.

Figure 2 – SSD 3x3 Selection Grid

Figure 2 – SSD 3x3 Selection Grid shows the workloads (RI, MU, WI) horizontally. The drive interface type are shown vertically (PCIe/NVMe, 12Gb SAS etc.) An example of using the grid is depicted by the thick black border which shows a MU workload and SATA interface. This examples produces a SATA MU SSD solution.

Overview

HPE SSD, AIC, M.2 and M.2 EKits Portfolio Overview
Read Intensive (RI) Mixed-Use (MU) Write Intensive (WI) Driven Workloads: Driven Workloads: Driven Workloads
Figure 2 – SSD 3x3 Selection Grid

Mixed-Use (MU)

- Balances resources for both business intelligence and business transaction processing.

Read Intensive

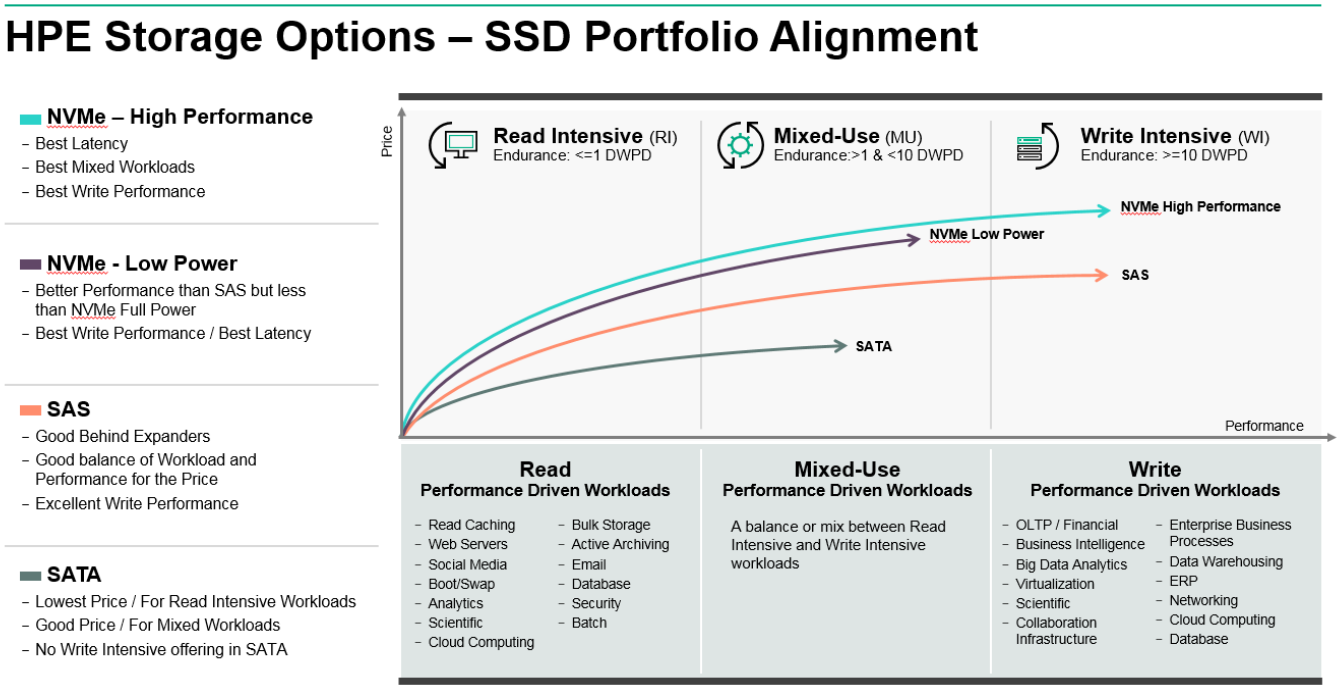
- Read Caching
- Web Servers
- Social Media
- Boot/Swap
- Analytics
- Cloud Computing
- Bulk Storage
- Active Archiving

Write Intensive

- OLTP/Financial
- Business Intelligence
- Big Data Analytics
- Virtualization
- Scientific
- Collaboration Infrastructure
- Enterprise Business

	Read Intensive (RI)	Mixed Use (MU)	Write Intensive (WI)
	Read Performance	**Balanced R/W Performance**	**Write Performance**
Drive Interface Type	**Endurance: <=1 DWPD**	**Endurance: >1 & <10 DWPD**	**Endurance: >=10 DWPD**
PCIe/NVMe 2.5" SFF, Add-in & Mezz Cards	Best Latency / Good Price	Best Latency	Best Write Performance & Latency
12Gb SAS 2.5" SFF	Low Price / Good Behind Expanders	Good Behind Expanders	Good Behind Expanders
6Gb SATA 2.5" SFF, M.2, & Enablement Kits	Lowest Price	Good Price	SATA Direct Connect

Figure 3 – SSD Portfolio Alignment



Using the above figures along with our **HPE SSD Selector Tool** you can quickly determine what SSD/AIC solution might best meet your needs. You can also compare specific capacity, performance attributes, and server compatibility.

Standard Features

What is a SSD?	An enduring data storage device utilizing NAND (negative-AND) semiconductor technology to store and access data which is volatile without the aid of an auxiliary power source.
SSD Quality	Today's businesses are seeing larger, more complex applications, coupled with an increasing amount of mission-critical and transaction processing data demand. In this environment, storage has become a critical component, significantly defining requirements for both systems reliability and performance. This is why HPE drives undergo a rigorous qualification process to ensure functionality and eliminate firmware and OS incompatibilities.
Integration	Many issues customers have with third party drives are "simple" integration issues. When buying from another supplier, there is no guarantee that a drive has been correctly set for proper operation with ProLiant servers and storage systems. These incompatibilities can create problems in configuration, can rob your system of performance, or at their worst, can cause you to lose data. HPE drives are specifically designed and tested for flawless operation in your HPE equipment. The integration of solid state drives in HPE systems means that associated components are right for your ProLiant server.
Support Matrix	Please see the following URL for the latest list of supported servers and enclosures: **https://www.hpe.com/us/en/servers.html**
Product Category	HPE Enterprise SSDs are available in three categories based on workload level: Read Intensive (RI), Mixed Use (MU), and Write Intensive (WI). These categories indicate the number of drive writes per day (DWPD1) that you can expect from the drive. (DWPD is the maximum number of 4K host writes to the entire drive capacity of the SSD per day over a five-year period).
Maximum Usage Limitations	NAND Flash devices use semiconductor technology that has a finite number of data that can be written to the device, defined as the Maximum Usage Limit, commonly called “Write Endurance”. Write Endurance - is measured while running 100% random 4KiB writes across the entire SSD. Drive Writes Per Day (DWPD) - Workload environment is based on 100% random 4KiB writes for five (5) years, which is the maximum amount of data that can be written to the device before reaching the device's write endurance limit. HPE Solid State Drives (SSDs) are equipped with tools that can report the amount of lifetime remaining. Introducing HPE SMARTSSD Wear Gauge™. To take advantage of SMARTSSD Wear Gauge™, Smart Array Firmware version 5.0 or greater is required and HPE Array Configuration Utility (ACU) or HPE Diagnostic Utility (ADU) must be running. **NOTE:** HPE SMARTSSD Wear Gauge™ is not supported on NVMe drives. Simple Network Management Protocol (SNMP) Storage Agents for both Microsoft® Windows® and Linux provide status and condition updates through traps, OS event logs and the HPE System Management Homepage: **https://www.hpe.com/us/en/product-catalog/detail/pip.hp-system-management-homepage-software.344313.html** The HPE SMARTSSD Wear Gauge™ requires a Smart Array or Smart HBA controller listed below. **Standard Features** • HPE Smart Array PX1X Controller Series or newer • HPE Smart HBA PX4X Controller Series • HPE Dynamic Smart Array BX2Xi Controller Series or newer • HPE Dynamic Smart Array B320i Controller **NOTE:** HPE Direct Connect to the HPE Smart Array B110i SATA RAID Controller is not currently supported by the above noted tool.

Standard Features

Data Retention	Data Retention is the period of time for retaining the data in the NAND once the maximum rated endurance level has occurred. These SSD's are rated for 3 months if no power is applied once the SSD has reached maximum rated write endurance.
Warranty	SSD & AIC Standard 3/0/0 warranty; Customer Self Repair (CSR) subject to maximum usage limitations. Maximum usage limit: This is the maximum amount of data that can be written to the drive. Drives that have reached this limit will not be eligible for warranty coverage. **NOTE:** In cases where an M.2 SSD is used in conjunction with a Server Cartridge the Warranty includes 3-Year Parts, 3-Year Labor, 3-Year (3/3/3) Onsite support for that option only.

Service and Support

Service and Support	**HPE Technology Services for Industry Standard Servers** 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. **NOTE:** HPE Solid State Drives are supported as a part of the HPE Server Infrastructure. No separate Support Services are needed to be purchased.
Connect your devices to HPE	Unlock all of the benefits of your technology investment by connecting your products to Hewlett Packard Enterprise. Achieve up to 77%1 reduction in down time, near 100%2 diagnostic accuracy and a single consolidated view of your environment. By connecting, you will receive 24x7monitoring, pre-failure alerts, automatic call logging, and automatic parts dispatch. HPE Proactive Care Service and HPE Datacenter Care Service customers will also benefit from proactive activities to help prevent issues and increase optimization. All of these benefits are already available to you with your server storage and networking products, securely connected to HPE support. 1. IDC Whitepaper 2. HPE CSC Reports 2014-2015
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 **HPE Support Center** HPE 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 Services or HPE contractual support agreement. **NOTE:** HPE Support Center Mobile App above 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.

Service and Support

Warranty / Service Coverage

For ProLiant servers and storage systems, the service on the main product covers HPE-branded hardware options not designated by Hewlett Packard Enterprise as requiring separate coverage, that are qualified for the server, purchased at the same time or afterward and internal to the enclosure. These items will be covered at the same service level and for the same coverage period as the server unless the maximum supported lifetime and/or the maximum usage limitation has been reached.

The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by Hewlett Packard Enterprise due to malfunction. It does not apply Disk or SSD/Flash Drives that have not failed. SSD/Flash Drives that are specified by Hewlett Packard Enterprise as consumable parts and/or that have reached maximum supported lifetime and/or the maximum usage limits as set forth in the manufacturer's operating manual, the product QuickSpecs, or the technical data sheet are not eligible for the defective media retention service feature option.

Subject to: Maximum supported lifetime: This is a period in years set to equal the warranty for the specific drive. After this period no further service coverage will be available for the drive. Maximum usage limit: This is the maximum amount of data that can be written to the drive. Drives that have reached this limit will not be eligible for services coverage.

Additional Notes Regarding Usage and Wear:

- DWPD (Drive-Writes-Per Day) ->Full drive writes per day for 5 years. Based on 100% Random Writes (KiB).
- HPE Enterprise SSDs deliver: Full data path error detection, surprise power loss protection and Smart SSD Wear Gauge support.

For more information

To learn more on services for HPE ESSN Options, please contact your Hewlett Packard Enterprise sales representative or Hewlett Packard Enterprise Authorized Channel Partner. Or visit:
https://www.hpe.com/us/en/product-catalog/servers/proliant-servers.html or
https://www.hpe.com/us/en/integrated-systems/bladesystem.html

SSD Selection

To streamline the configuration process for HPE ProLiant Gen9 servers and to provide the best product availability, HPE recommends SSDs from the list located here: **http://www.hpe.com/products/recommend**

Best product availability is limited to US, Canada, and Latin America at this time.

To further assist with configuration, HPE also offers an SSD Selector Tool located here: **http://ssd.hpe.com**

Supporting Helpful Links

http://www.hpe.com/info/rackandpower
http://www.hpe.com/info/poweradvisor
http://www.hpe.com/info/infrastructurearchitect
https://www.hpe.com/us/en/storage/entry-level.html

Also:
Take control of your data - A guide to understanding storage technologies.
http://www.hpe.com/h20195/V2/getpdf.aspx/4AA4-7667ENW.pdf?ver=1.0

Technical Specifications

SATA Interface– Recommended (Capacity, Workload, Carrier…)

NOTE:

The Server Gen Supported (Select Platforms) are Gen9 & 10

The Digitally Signed Firmware (DS) is set to "Yes"

HPE Option KIT SKU	Short Description	Capacity	Workload Type	Form Factor	Plug Type	Carrier Type	Flash Type
875483-B21	HPE 240GB SATA MU SFF SC DS SSD	240	MU	SFF	Hot Plug	SC	TLC
875470-B21	HPE 480GB SATA MU SFF SC DS SSD	480	MU	SFF	Hot Plug	SC	TLC
875474-B21	HPE 960GB SATA MU SFF SC DS SSD	960	MU	SFF	Hot Plug	SC	TLC
875478-B21	HPE 1.92TB SATA MU SFF SC DS SSD	1920	MU	SFF	Hot Plug	SC	TLC
880295-B21	HPE 240GB SATA MU SFF SC DS SSD	240	MU	SFF	Hot Plug	SC	MLC
877776-B21	HPE 480GB SATA MU SFF SC DS SSD	480	MU	SFF	Hot Plug	SC	MLC
877782-B21	HPE 960GB SATA MU SFF SC DS SSD	960	MU	SFF	Hot Plug	SC	MLC
877788-B21	HPE 1.92TB SATA MU SFF SC DS SSD	1920	MU	SFF	Hot Plug	SC	MLC
877784-B21	HPE 960GB SATA MU LFF SCC DS SSD	960	MU	LFF	Hot Plug	SCC	MLC
875480-B21	HPE 1.92TB SATA MU LFF SCC DS SSD	1920	MU	LFF	Hot Plug	SCC	TLC
877790-B21	HPE 1.92TB SATA MU LFF SCC DS SSD	1920	MU	LFF	Hot Plug	SCC	MLC
875488-B21	HPE 240GB SATA MU M.2 2280 DS SSD	240	MU	M.2	N/A	N/A	TLC
868814-B21	HPE 240GB SATA RI SFF SC DS SSD	240	RI	SFF	Hot Plug	SC	MLC
868818-B21	HPE 480GB SATA RI SFF SC DS SSD	480	RI	SFF	Hot Plug	SC	MLC
868822-B21	HPE 960GB SATA RI SFF SC DS SSD	960	RI	SFF	Hot Plug	SC	MLC
868826-B21	HPE 1.92TB SATA RI SFF SC DS SSD	1920	RI	SFF	Hot Plug	SC	MLC
868830-B21	HPE 3.84TB SATA RI SFF SC DS SSD	3840	RI	SFF	Hot Plug	SC	MLC
875503-B21	HPE 240GB SATA RI SFF SC DS SSD	240	RI	SFF	Hot Plug	SC	TLC
875509-B21	HPE 480GB SATA RI SFF SC DS SSD	480	RI	SFF	Hot Plug	SC	TLC
875511-B21	HPE 960GB SATA RI SFF SC DS SSD	960	RI	SFF	Hot Plug	SC	TLC
875513-B21	HPE 1.92TB SATA RI SFF SC DS SSD	1920	RI	SFF	Hot Plug	SC	TLC

Technical Specifications

877740-B21	HPE 240GB SATA RI SFF SC DS SSD	240	RI	SFF	Hot Plug	SC	MLC
877746-B21	HPE 480GB SATA RI SFF SC DS SSD	480	RI	SFF	Hot Plug	SC	MLC
877752-B21	HPE 960GB SATA RI SFF SC DS SSD	960	RI	SFF	Hot Plug	SC	MLC
877758-B21	HPE 1.92TB SATA RI SFF SC DS SSD	1920	RI	SFF	Hot Plug	SC	MLC
877764-B21	HPE 3.84TB SATA RI SFF SC DS SSD	3840	RI	SFF	Hot Plug	SC	MLC
877748-B21	HPE 480GB SATA RI LFF SCC DS SSD	480	RI	LFF	Hot Plug	SCC	MLC
875317-B21	HPE 150GB SATA RI M.2 2280 DS SSD	150	RI	M.2	N/A	N/A	MLC
875319-B21	HPE 480GB SATA RI M.2 2280 DS SSD	480	RI	M.2	N/A	N/A	MLC

Technical Specifications

SATA Interface – Recommended (Speeds & Feeds)

HPE Option KIT SKU	Lifetime Writes (TB)	Endurance DWPD	MAX Seq Reads Throughput (MiB/s)	MAX Seq Writes Throughput (MiB/s)	Random Read Average Latency uSec (4KiB,Q1)	Random Write Average Latency uSec (4KiB,Q1)	Random Read IOPS (4KiB, Q=16)	Random Write IOPS (4KiB, Q=16)	MAX Random Read IOPS (4KiB)	MAX Random Write IOPS (4KiB)
875483-B21	2,200	5.00	510	320	125	40	62,000	52,500	70,000 @Q32	52,500 @Q16
875470-B21	4,400	5.00	510	455	125	40	62,000	52,500	68,500 @Q32	52,500 @Q16
875474-B21	8,800	5.00	510	480	130	40	60,000	52,500	67,500 @Q32	52,500 @Q16
875478-B21	17,600	5.00	500	480	190	40	54,000	53,000	61,500 @Q32	53,000 @Q4
880295-B21	1,400	3.00	500	240	120	48	59,000	37,000	65,000 @Q32	37,000 @Q4
877776-B21	2,950	3.00	500	455	120	48	60,000	46,000	65,000 @Q32	47,500 @Q32
877782-B21	5,250	3.00	500	455	120	48	60,000	45,000	65,000 @Q32	47,500 @Q32
877788-B21	10,840	3.00	500	435	120	48	60,000	45,000	65,000 @Q32	47,500 @Q32
877784-B21	5,250	3.00	500	455	120	48	60,000	45,000	65,000 @Q32	47,500 @Q32
875480-B21	17,600	5.00	500	480	190	40	54,000	53,000	61,500 @Q32	53,000 @Q4
877790-B21	10,870	3.00	500	435	120	48	60,000	45,000	65,000 @Q32	47,500 @Q32
875488-B21	650	1.50	500	260	135	40	60,000	34,000	66,000 @Q32	34,000 @Q4
868814-B21	372	0.80	370	300	120	105	66,000	9,800	73,000 @Q32	9,800@ Q4
868818-B21	754	0.80	530	490	120	58	66,000	17,000	75,500 @Q32	17,000 @Q1
868822-B21	1,489	0.80	530	490	120	41	64,000	24,500	75,500 @Q32	24,500 @Q4
868826-B21	2,979	0.80	530	490	120	38	61,500	26,000	73,500 @Q32	26,000 @Q1
868830-B21	6,512	0.80	530	490	120	36	63,500	27,500	75,500 @Q32	27,500 @Q1
875503-B21	650	1.50	505	260	125	40	62,500	33,000	69,500 @Q32	33,000 @Q4
875509-B21	450	0.50	505	380	125	40	61,000	34,000	67,000 @Q32	34,000 @Q4
875511-B21	900	0.50	505	475	125	40	61,000	31,000	67,000 @Q32	31,000 @Q4
875513-B21	3,200	0.90	505	475	130	40	59,000	27,000	67,000 @Q32	27,000 @Q4

Technical Specifications

877740-B21	620	1.40	500	185	120	60	56,000	17,000	64,000 @Q32	17,000 @Q1
877746-B21	900	1.00	500	330	120	60	60,000	20,000	64,000 @Q32	20,000 @Q4
877752-B21	1,860	1.00	500	465	120	60	60,000	30,000	64,000 @Q32	30,000 @Q16
877758-B21	3,270	1.00	500	445	120	60	57,000	31,000	64,000 @Q32	31,000 @Q16
877764-B21	7,640	1.00	500	445	120	60	59,000	30,000	63,000 @Q32	30,000 @Q16
877748-B21	900	1.00	500	330	120	60	60,000	20,000	64,000 @Q32	20,000 @Q4
875317-B21	80	0.30	190	175	150	175	41,000	6,000	44,500 @Q32	6,000@ Q4
875319-B21	256	0.30	365	275	170	100	49,000	11,900	50,000 @Q32	11,900 @Q4

NOTE: Reference column VI-1 when comparing RI SSDs, & column VI-2 for comparing MU & WI SSDs.

Technical Specifications

SATA Interface – Recommended (Power & Height)

HPE Option KIT SKU	Short Description	Power Idle Time	Power Random Read	Power Random Write	Power Sequential Read	Power Sequential Write	Power Random R/W	z-Height
875483-B21	HPE 240GB SATA MU SFF SC DS SSD	1.07	3.00	3.00	3.21	3.90	2.95	7mm
875470-B21	HPE 480GB SATA MU SFF SC DS SSD	3.22	3.43	7.85	5.70	7.71	5.88	7mm
875474-B21	HPE 960GB SATA MU SFF SC DS SSD	3.22	5.31	11.56	5.22	11.04	6.53	7mm
875478-B21	HPE 1.92TB SATA MU SFF SC DS SSD	3.22	3.63	12.07	4.52	12.07	6.52	7mm
880295-B21	HPE 240GB SATA MU SFF SC DS SSD	1.25	2.45	3.40	2.37	3.40	2.91	7mm
877776-B21	HPE 480GB SATA MU SFF SC DS SSD	1.25	2.42	4.25	2.19	4.44	3.06	7mm
877782-B21	HPE 960GB SATA MU SFF SC DS SSD	1.31	2.64	4.90	2.28	4.74	3.41	7mm
877788-B21	HPE 1.92TB SATA MU SFF SC DS SSD	1.31	2.87	5.48	2.35	4.86	3.74	7mm
877784-B21	HPE 960GB SATA MU LFF SCC DS SSD	1.32	2.64	4.90	2.28	4.74	3.42	7mm
875480-B21	HPE 1.92TB SATA MU LFF SCC DS SSD	1.07	3.51	3.51	4.52	6.12	3.40	7mm
877790-B21	HPE 1.92TB SATA MU LFF SCC DS SSD	1.32	2.87	5.48	2.35	4.86	3.74	7mm
875488-B21	HPE 240GB SATA MU M.2 2280 DS SSD	1.07	3.00	3.00	3.21	3.90	2.95	2280 M.2
868814-B21	HPE 240GB SATA RI SFF SC DS SSD	1.24	2.34	2.34	2.68	2.71	2.34	7mm
868818-B21	HPE 480GB SATA RI SFF SC DS SSD	1.26	2.79	2.79	2.70	3.52	2.79	7mm
868822-B21	HPE 960GB SATA RI SFF SC DS SSD	1.28	2.80	2.80	2.82	3.64	2.80	7mm
868826-B21	HPE 1.92TB SATA RI SFF SC DS SSD	1.29	2.87	2.87	3.10	3.98	2.87	7mm
868830-B21	HPE 3.84TB SATA RI SFF SC DS SSD	1.41	3.05	3.05	3.29	4.24	3.05	7mm
875503-B21	HPE 240GB SATA RI SFF SC DS SSD	1.07	3.00	3.00	3.21	3.90	2.95	7mm
875509-B21	HPE 480GB SATA RI SFF SC DS SSD	1.07	3.17	3.17	3.82	5.62	3.10	7mm
875511-B21	HPE 960GB SATA RI SFF SC DS SSD	1.07	3.17	3.17	3.82	5.62	3.10	7mm
875513-B21	HPE 1.92TB SATA RI SFF SC DS SSD	1.07	3.51	3.51	4.52	6.12	3.40	7mm

Technical Specifications

877740-B21	HPE 240GB SATA RI SFF SC DS SSD	1.24	2.64	2.84	2.20	2.83	2.64	7mm
877746-B21	HPE 480GB SATA RI SFF SC DS SSD	1.25	2.40	3.60	2.17	3.52	3.08	7mm
877752-B21	HPE 960GB SATA RI SFF SC DS SSD	1.31	2.69	4.60	2.31	4.70	3.76	7mm
877758-B21	HPE 1.92TB SATA RI SFF SC DS SSD	1.29	2.77	5.23	2.35	4.89	4.10	7mm
877764-B21	HPE 3.84TB SATA RI SFF SC DS SSD	1.35	3.00	5.44	2.50	5.28	4.28	7mm
877748-B21	HPE 480GB SATA RI LFF SCC DS SSD	1.20	2.40	3.60	2.17	3.52	3.08	7mm
875317-B21	HPE 150GB SATA RI M.2 2280 DS SSD	0.72	2.06	2.06	2.24	2.55	2.06	2280 M.2
875319-B21	HPE 480GB SATA RI M.2 2280 DS SSD	0.67	2.44	2.44	2.91	3.33	2.44	2280 M.2

NOTE: Please use HPE Selector Tool **http://ssd.hpe.com/** to determine server compatibility.

Technical Specifications

SAS Interface – Recommended (Capacity, Workload, Carrier…)

NOTE: The Server Gen Supported (Select Platforms) are Gen9 & 10
The Digitally Signed Firmware (DS) is set to "Yes"

HPE Option KIT SKU	Short Description	Capacity	Workload Type	Interface Type	Form Factor	Plug Type	Carrier Type	Flash Type
873351-B21	HPE 400GB SAS 12G WI SFF SC DS SSD	400	WI	SAS	SFF	Hot Plug	SC	MLC
873355-B21	HPE 800GB SAS 12G WI SFF SC DS SSD	800	WI	SAS	SFF	Hot Plug	SC	MLC
873357-B21	HPE 1.6TB SAS 12G WI SFF SC DS SSD	1600	WI	SAS	SFF	Hot Plug	SC	MLC
872374-B21	HPE 400GB SAS 12G MU SFF SC DS SSD	400	MU	SAS	SFF	Hot Plug	SC	MLC
872376-B21	HPE 800GB SAS 12G MU SFF SC DS SSD	800	MU	SAS	SFF	Hot Plug	SC	MLC
872382-B21	HPE 1.6TB SAS 12G MU SFF SC DS SSD	1600	MU	SAS	SFF	Hot Plug	SC	MLC
872386-B21	HPE 3.2TB SAS 12G MU SFF SC DS SSD	3200	MU	SAS	SFF	Hot Plug	SC	MLC
873359-B21	HPE 400GB SAS 12G MU SFF SC DS SSD	400	MU	SAS	SFF	Hot Plug	SC	MLC
873363-B21	HPE 800GB SAS 12G MU SFF SC DS SSD	800	MU	SAS	SFF	Hot Plug	SC	MLC
873365-B21	HPE 1.6TB SAS 12G MU SFF SC DS SSD	1600	MU	SAS	SFF	Hot Plug	SC	MLC
873367-B21	HPE 3.2TB SAS 12G MU SFF SC DS SSD	3200	MU	SAS	SFF	Hot Plug	SC	MLC
872380-B21	HPE 800GB SAS 12G MU LFF LPC DS SSD	800	MU	SAS	LFF	Hot Plug	LPC	MLC
872384-B21	HPE 1.6TB SAS 12G MU LFF LPC DS SSD	1600	MU	SAS	LFF	Hot Plug	LPC	MLC
872390-B21	HPE 960GB SAS 12G RI SFF SC DS SSD	960	RI	SAS	SFF	Hot Plug	SC	MLC
872392-B21	HPE 1.92TB SAS 12G RI SFF SC DS SSD	1920	RI	SAS	SFF	Hot Plug	SC	MLC
872394-B21	HPE 3.84TB SAS 12G RI SFF SC DS SSD	3840	RI	SAS	SFF	Hot Plug	SC	MLC
875311-B21	HPE 480GB SAS RI SFF SC DS SSD	480	RI	SAS	SFF	Hot Plug	SC	MLC
875313-B21	HPE 960GB SAS RI SFF SC DS SSD	960	RI	SAS	SFF	Hot Plug	SC	MLC
875326-B21	HPE 1.92TB SAS RI SFF SC DS SSD	1920	RI	SAS	SFF	Hot Plug	SC	TLC
875330-B21	HPE 3.84TB SAS RI SFF SC DS SSD	3840	RI	SAS	SFF	Hot Plug	SC	TLC

Technical Specifications

SAS Interface - Recommended (Speeds & Feeds)

HPE Option KIT SKU	Lifetime Writes (TB)	Endurance DWPD	MAX Seq Reads Through-put (MiB/s)	MAX Seq Writes Through-put (MiB/s)	Random Read Average Latency uSec (4KiB,Q1)	Random Write Average Latency uSec (4KiB,Q1)	Random Read IOPS (4KiB, Q=16)	Random Write IOPS (4KiB, Q=16)	MAX Random Read IOPS (4KiB)	MAX Random Write IOPS (4KiB)
873351-B21	7	10.00	1,050	1,005	110	45	100,000	100,000	170,000 @Q64	100,000 @Q16
873355-B21	15	10.00	1,050	1,005	105	35	120,000	100,000	170,000 @Q64	100,000 @Q16
873357-B21	29	10.00	1,050	1,005	105	35	125,000	100,000	170,000 @Q64	100,000 @Q16
872374-B21	2,190	3.00	1,075	1,025	120	48	120,000	80,000	185,000 @Q32	80,000@ Q16
872376-B21	4,380	3.00	1,075	1,025	126	57	120,000	90,000	185,000 @Q32	90,000@ Q16
872382-B21	8,760	3.00	1,075	1,025	120	48	125,000	93,000	185,000 @Q32	93,000@ Q16
872386-B21	17,520	3.00	1,075	1,025	120	50	125,000	93,000	185,000 @Q32	93,000@ Q16
873359-B21	2	3.00	1,050	820	105	35	115,000	100,000	170,000 @Q64	100,000 @Q16
873363-B21	5	3.00	1,050	1,010	105	35	120,000	100,000	170,000 @Q64	100,000 @Q16
873365-B21	9	3.00	1,050	1,010	105	35	125,000	100,000	170,000 @Q64	100,000 @Q16
873367-B21	18	3.00	1,050	1,010	105	35	130,000	100,000	170,000 @Q64	100,000 @Q16
872380-B21	4,380	3.00	1,075	1,025	126	57	120,000	90,000	185,000 @Q32	90,000@ Q16
872384-B21	8,760	3.00	1,075	1,025	120	48	125,000	93,000	185,000 @Q32	93,000@ Q16
872390-B21	1,752	1.00	1,070	1,025	120	50	120,000	29,000	185,000 @Q32	29,000@ Q4
872392-B21	3,504	1.00	1,070	1,025	120	50	125,000	34,000	185,000 @Q32	34,000@ Q4
872394-B21	7,008	1.00	1,070	1,025	120	50	125,000	34,000	185,000 @Q32	34,000@ Q4
875311-B21	876	1.00	940	615	115	47	110,000	21,000	170,000 @Q128	21,000@ Q1
875313-B21	1,752	1.00	940	1,015	115	42	110,000	32,000	170,000 @Q128	32,000@ Q4
875326-B21	3,504	1.00	940	1,020	115	42	110,000	37,000	170,000 @Q128	37,000@ Q4

Technical Specifications

875330-B21	7,008	1.00	940	1,020	115	40	110,000	26,000	170,000 @Q128	26,000@ Q4

NOTE: Reference column VI-1 when comparing RI SSDs, & column VI-2 for comparing MU & WI SSDs.

Technical Specifications

SAS Interface - Recommended (Power & Height)

HPE Option KIT SKU	Short Description	Power Idle Time	Power Random Read	Power Random Write	Power Sequential Read	Power Sequential Write	Power Random R/W	z-Height
873351-B21	HPE 400GB SAS 12G WI SFF SC DS SSD	3.46	5.86	5.86	5.65	8.08	5.86	15mm
873355-B21	HPE 800GB SAS 12G WI SFF SC DS SSD	3.61	6.19	6.19	6.63	10.65	6.19	15mm
873357-B21	HPE 1.6TB SAS 12G WI SFF SC DS SSD	3.22	6.66	6.66	6.07	9.89	6.66	15mm
872374-B21	HPE 400GB SAS 12G MU SFF SC DS SSD	3.82	4.33	4.33	6.41	8.42	4.33	15mm
872376-B21	HPE 800GB SAS 12G MU SFF SC DS SSD	3.06	4.07	4.07	6.28	8.22	4.07	15mm
872382-B21	HPE 1.6TB SAS 12G MU SFF SC DS SSD	3.64	4.16	4.16	6.95	8.67	4.16	15mm
872386-B21	HPE 3.2TB SAS 12G MU SFF SC DS SSD	4.22	4.74	4.74	7.75	9.50	4.74	15mm
873359-B21	HPE 400GB SAS 12G MU SFF SC DS SSD	3.64	5.39	5.39	5.60	7.29	5.39	15mm
873363-B21	HPE 800GB SAS 12G MU SFF SC DS SSD	3.58	5.99	5.99	6.47	9.84	5.99	15mm
873365-B21	HPE 1.6TB SAS 12G MU SFF SC DS SSD	3.56	6.45	6.45	6.39	10.18	6.45	15mm
873367-B21	HPE 3.2TB SAS 12G MU SFF SC DS SSD	4.24	8.74	8.74	6.51	9.93	8.74	15mm
872380-B21	HPE 800GB SAS 12G MU LFF LPC DS SSD	3.06	4.07	4.07	6.28	8.22	4.07	15mm
872384-B21	HPE 1.6TB SAS 12G MU LFF LPC DS SSD	3.64	4.16	4.16	6.95	8.67	4.16	15mm
872390-B21	HPE 960GB SAS 12G RI SFF SC DS SSD	3.06	4.07	4.07	6.28	8.22	4.07	15mm
872392-B21	HPE 1.92TB SAS 12G RI SFF SC DS SSD	3.64	4.16	4.16	6.95	8.67	4.16	15mm
872394-B21	HPE 3.84TB SAS 12G RI SFF SC DS SSD	4.22	4.74	4.74	7.75	9.50	4.74	15mm
875311-B21	HPE 480GB SAS RI SFF SC DS SSD	4.33	4.67	4.67	4.89	6.76	4.67	15mm
875313-B21	HPE 960GB SAS RI SFF SC DS SSD	4.37	4.73	4.73	4.97	6.79	4.73	15mm
875326-B21	HPE 1.92TB SAS RI SFF SC DS SSD	4.45	4.83	4.83	4.97	6.83	4.83	15mm
875330-B21	HPE 3.84TB SAS RI SFF SC DS SSD	4.38	4.69	4.69	4.96	6.60	4.69	15mm

NOTE: Please use HPE Selector Tool **http://ssd.hpe.com/** to determine server compatibility.

Technical Specifications

PCIe/NVMe Interface – Recommended SKUs (Capacity, Workload, Carrier…)

NOTE:
The Server Gen Supported (Select Platforms) are Gen9 & 10
The Digitally Signed Firmware (DS) is set to "Yes"

HPE Option KIT SKU	Short Description	Capacity	Workload Type	Interface Type	Form Factor	Plug Type	Carrier Type	Flash Type
875593-B21	HPE 400GB NVMe x4 MU SFF SCN DS SSD	400	MU	PCIe / PCIe NVMe	SFF	Hot Plug	SCN	MLC
875595-B21	HPE 800GB NVMe x4 MU SFF SCN DS SSD	800	MU	PCIe / PCIe NVMe	SFF	Hot Plug	SCN	MLC
877994-B21	HPE 1.6TB NVMe x4 MU SFF SCN DS SSD	1600	MU	PCIe / PCIe NVMe	SFF	Hot Plug	SCN	MLC
875587-B21	HPE 480GB NVMe x4 RI SFF SCN DS SSD	480	RI	PCIe / PCIe NVMe	SFF	Hot Plug	SCN	MLC
875589-B21	HPE 960GB NVMe x4 RI SFF SCN DS SSD	960	RI	PCIe / PCIe NVMe	SFF	Hot Plug	SCN	MLC
877986-B21	HPE 2TB NVMe x4 RI SFF SCN DS SSD	2000	RI	PCIe / PCIe NVMe	SFF	Hot Plug	SCN	MLC

PCIe/NVMe Interface – Recommended SKUs (Speeds and Feeds)

HPE Option KIT SKU	Lifetime Writes (TB)	Endurance DWPD	MAX Seq Reads Throughput (MiB/s)	MAX Seq Writes Throughput (MiB/s)	Random Read Average Latency uSec (4KiB,Q1)	Random Write Average Latency uSec (4KiB,Q1)	Random Read IOPS (4KiB, Q=16)	Random Write IOPS (4KiB, Q=16)	MAX Random Read IOPS (4KiB)	MAX Random Write IOPS (4KiB)
875593-B21	2,475	3.00	2,040	490	100	40	125,000	24,500	220,000 @Q64	24,500 @Q16
875595-B21	4,950	3.00	2,400	840	100	32	135,000	32,000	245,000 @Q64	32,000 @Q16
877994-B21	8,520	2.92	3,200	2,000	86	17	165,000	240,000	675,000 @Q256	240,000 @Q16
875587-B21	775	0.30	2,400	485	100	105	125,000	9,500	220,000 @Q64	9,500@ Q1
875589-B21	1,550	0.30	2,400	835	100	75	135,000	13,500	240,000 @Q64	13,500 @Q1
877986-B21	1,790	0.49	3,200	1,100	87	25	150,000	41,000	510,000 @Q256	41,000 @Q4

NOTE: Reference column VI-1 when comparing RI SSDs, & column VI-2 for comparing MU & WI SSDs.

Technical Specifications

PCIe/NVMe Interface – Recommended SKUs (Power & Height)

HPE Option KIT SKU	Short Description	Power Idle Time	Power Random Read	Power Random Write	Power Sequential Read	Power Sequential Write	Power Random R/W	z-Height
875593-B21	HPE 400GB NVMe x4 MU SFF SCN DS SSD	3.22	3.46	7.68	6.40	7.51	5.51	7mm
875595-B21	HPE 800GB NVMe x4 MU SFF SCN DS SSD	3.22	6.40	10.70	6.72	6.85	6.89	7mm
877994-B21	HPE 1.6TB NVMe x4 MU SFF SCN DS SSD	<5.00	10.60	13.10	8.70	13.40	11.70	15mm
875587-B21	HPE 480GB NVMe x4 RI SFF SCN DS SSD	3.22	3.43	7.85	5.70	7.71	5.88	7mm
875589-B21	HPE 960GB NVMe x4 RI SFF SCN DS SSD	3.22	5.31	11.56	5.22	11.04	6.53	7mm
877986-B21	HPE 2TB NVMe x4 RI SFF SCN DS SSD	<5.00	11.35	12.90	9.62	13.45	12.00	15mm

NOTE: Please use HPE Selector Tool **http://ssd.hpe.com/** to determine server compatibility.

Inbox NVMe Drivers

Inbox NVMe drivers for the operating systems listed below have been tested on HPE NVMe SSDs and Add-in Cards. Check the specifications for the HPE server of interest to determine if it supports one of these Operating Systems.

- Windows Server 2016
- Windows Server 2012R2
- Red Hat Enterprise Linux Server 6.5
- Red Hat Enterprise Linux Server 7.0
- SUSE Linux Enterprise Server 12
- Ubuntu 14.04

VMWare vSphere 6.1

M.2 Enablement Kits – Recommended (Capacity, Workload, Carrier…)

NOTE: The Server Gen Supported (Select Platforms) are Gen9 & 10
The Digitally Signed Firmware (DS) is set to "Yes"

HPE Option KIT SKU	Short Description	Capacity	Workload Type	Interface Type	Form Factor	Plug Type	Carrier Type	Flash Type
880875-B21	HPE 2x150GB SATA M.2 - SFF SCM DS SSD	300	RI	SATA	M.2	Hot Plug	SCM	MLC
880877-B21	HPE 2x480GB SATA M.2 - SFF SCM DS SSD	960	RI	SATA	M.2	Hot Plug	SCM	MLC
878783-B21*	HPE Universal SATA HH M.2 Kit[1]	N/A	N/A	SATA	M.2e	Non-Hot Plug	AIC	N/A

NOTE : *878783-B21 enablement Kit is an Add-In-Card, for installation inside of the server, that can be configured to be either Single or Dual with choice of any SATA 2280 M.2 in the HPE M.2 portfolio. See SATA M.2s in Recommended and Extended Tables above.

Technical Specifications

M.2 Enablement Kits – Recommended (Speeds & Feeds)

Speeds and Feeds information should be taken from the M.2 drives used within the enablement kits. See SATA M.2s in tables above

M.2 Enablement Kits – Recommended (Power & Height)

HPE Option KIT SKU	Short Description	Power Idle Time	Power Random Read	Power Random Write	Power Sequential Read	Power Sequential Write	Power Random R/W	z-Height
880875-B21	HPE 2x150GB SATA M.2 - SFF SCM DS SSD	1.44	4.12	4.12	4.48	5.10	4.12	15 mm
880877-B21	HPE 2x480GB SATA M.2 - SFF SCM DS SSD	1.34	4.88	4.88	5.82	6.66	4.88	15 mm
878783-B21*	HPE Universal SATA HH M.2 Kit[1]	N/A	N/A	N/A	N/A	N/A	N/A	Half Height/ Half Length

NOTE: *878783-B21 enablement Kit is an Add-In-Card, for installation inside of the server, that can be configured to be either Single or Dual with choice of any SATA 2280 M.2 in the HPE M.2 portfolio. See SATA M.2s in Recommended and Extended Tables above.

NOTE: Please use HPE Selector Tool **http://ssd.hpe.com/** to determine server compatibility

Technical Specifications

SATA – Extended (Capacity, Workload, Carrier…)

NOTE: The Server Gen Supported (Select Platforms) are Gen9 & 10

The Digitally Signed Firmware (DS) is set to "Yes

HPE Option KIT SKU	Short Description	Capacity	Workload Type	Interface Type	Form Factor	Plug Type	Carrier Type	Flash Type
872344-B21	HPE 480GB SATA MU SFF SC DS SSD	480	MU	SATA	SFF	Hot Plug	SC	MLC
872348-B21	HPE 960GB SATA MU SFF SC DS SSD	960	MU	SATA	SFF	Hot Plug	SC	MLC
872352-B21	HPE 1.92TB SATA MU SFF SC DS SSD	1920	MU	SATA	SFF	Hot Plug	SC	MLC
872346-B21	HPE 480GB SATA MU LFF SCC DS SSD	480	MU	SATA	LFF	Hot Plug	SCC	MLC
872350-B21	HPE 960GB SATA MU LFF SCC DS SSD	960	MU	SATA	LFF	Hot Plug	SCC	MLC
875490-B21	HPE 480GB SATA MU M.2 2280 DS SSD	480	MU	SATA	M.2	N/A	N/A	TLC
875492-B21	HPE 960GB SATA MU M.2 2280 DS SSD	960	MU	SATA	M.2	N/A	N/A	TLC
875507-B21	HPE 240GB SATA RI SFF RW DS SSD	240	RI	SATA	SFF	Hot Plug	RW	TLC
869056-B21	HPE 480GB SATA RI LFF LPC DS SSD	480	RI	SATA	LFF	Hot Plug	LPC	MLC
869058-B21	HPE 1.92TB SATA RI LFF LPC DS SSD	1920	RI	SATA	LFF	Hot Plug	LPC	MLC
877756-B21	HPE 960GB SATA RI LFF LPC DS SSD	960	RI	SATA	LFF	Hot Plug	LPC	MLC
877762-B21	HPE 1.92TB SATA RI LFF LPC DS SSD	1920	RI	SATA	LFF	Hot Plug	LPC	MLC
877754-B21	HPE 960GB SATA RI LFF SCC DS SSD	960	RI	SATA	LFF	Hot Plug	SCC	MLC
877760-B21	HPE 1.92TB SATA RI LFF SCC DS SSD	1920	RI	SATA	LFF	Hot Plug	SCC	MLC
875498-B21	HPE 480GB SATA RI M.2 2280 DS SSD	480	RI	SATA	M.2	N/A	N/A	TLC
875500-B21	HPE 960GB SATA RI M.2 2280 DS SSD	960	RI	SATA	M.2	N/A	N/A	TLC

Technical Specifications

SATA Interface – Extended (Speeds & Feeds)

HPE Option KIT SKU	Lifetime Writes (TB)	Endurance DWPD	MAX Seq Reads Throughput (MiB/s)	MAX Seq Writes Throughput (MiB/s)	Random Read Average Latency uSec (4KiB,Q1)	Random Write Average Latency uSec (4KiB,Q1)	Random Read IOPS (4KiB, Q=16)	Random Write IOPS (4KiB, Q=16)	MAX Random Read IOPS (4KiB)	MAX Random Write IOPS (4KiB)
872344-B21	3,364	3.50	510	475	110	50	63,000	20,000	69,000 @Q32	20,000 @Q4
872348-B21	6,727	3.50	510	475	110	40	62,000	26,500	69,000 @Q32	26,500 @Q4
872352-B21	13,400	3.50	500	475	110	38	61,500	28,500	69,000 @Q32	28,500 @Q4
872346-B21	3,364	3.50	510	475	110	50	63,000	20,000	69,000 @Q32	20,000 @Q4
872350-B21	6,727	3.50	510	475	110	40	62,000	26,500	69,000 @Q32	26,500 @Q4
875490-B21	1,300	1.50	500	400	130	40	60,000	34,000	68,000 @Q32	34,000 @Q4
875492-B21	4,400	2.60	500	465	130	40	60,000	30,000	68,000 @Q32	30,000 @Q4
875507-B21	650	1.50	505	260	125	40	62,500	33,000	69,500 @Q32	33,000 @Q4
869056-B21	754	0.80	530	490	120	58	66,000	17,000	75,500 @Q32	17,000 @Q1
869058-B21	2,979	0.80	530	490	120	38	61,500	26,000	73,500 @Q32	26,000 @Q1
877756-B21	1,860	1.00	500	465	120	60	60,000	30,000	64,000 @Q32	30,000 @Q16
877762-B21	3,270	1.00	500	445	120	60	57,000	31,000	64,000 @Q32	31,000 @Q16
877754-B21	1,860	1.00	500	465	120	60	60,000	30,000	64,000 @Q32	30,000 @Q16
877760-B21	3,270	1.00	500	445	120	60	57,000	31,000	64,000 @Q32	31,000 @Q16
875498-B21	450	0.50	500	425	130	40	61,000	46,000	67,000 @Q32	46,000 @Q64
875500-B21	900	0.50	500	465	130	40	61,000	41,000	67,000 @Q32	41,000 @Q4

NOTE: Reference column VI-1 when comparing RI SSDs, & column VI-2 for comparing MU & WI SSDs.

Technical Specifications

SATA Interface – Extended (Power & Height)

HPE Option KIT SKU	Short Description	Power Idle Time	Power Random Read	Power Random Write	Power Sequential Read	Power Sequential Write	Power Random R/W	z-Height
872344-B21	HPE 480GB SATA MU SFF SC DS SSD	1.23	2.51	2.51	2.59	2.83	2.51	7mm
872348-B21	HPE 960GB SATA MU SFF SC DS SSD	1.23	2.66	2.66	2.69	2.84	2.66	7mm
872352-B21	HPE 1.92TB SATA MU SFF SC DS SSD	1.23	2.59	2.59	2.71	2.84	2.59	7mm
872346-B21	HPE 480GB SATA MU LFF SCC DS SSD	1.23	2.51	2.51	2.59	2.83	2.51	7mm
872350-B21	HPE 960GB SATA MU LFF SCC DS SSD	1.23	2.66	2.66	2.69	2.84	2.66	7mm
875490-B21	HPE 480GB SATA MU M.2 2280 DS SSD	1.07	3.02	3.02	3.42	4.03	3.00	2280 M.2
875492-B21	HPE 960GB SATA MU M.2 2280 DS SSD	1.07	3.17	3.17	3.82	5.62	3.10	2280 M.2
875507-B21	HPE 240GB SATA RI SFF RW DS SSD	1.07	3.00	3.00	3.21	3.90	2.95	7mm
869056-B21	HPE 480GB SATA RI LFF LPC DS SSD	1.26	2.79	2.79	2.70	3.52	2.79	7mm
869058-B21	HPE 1.92TB SATA RI LFF LPC DS SSD	1.29	2.87	2.87	3.10	3.98	2.87	7mm
877756-B21	HPE 960GB SATA RI LFF LPC DS SSD	1.29	2.69	4.60	2.31	4.70	3.76	7mm
877762-B21	HPE 1.92TB SATA RI LFF LPC DS SSD	1.29	2.77	5.23	2.35	4.86	4.10	7mm
877754-B21	HPE 960GB SATA RI LFF SCC DS SSD	1.31	2.69	4.60	2.31	4.70	3.76	7mm
877760-B21	HPE 1.92TB SATA RI LFF SCC DS SSD	1.29	2.77	5.23	2.35	4.86	4.10	7mm
875498-B21	HPE 480GB SATA RI M.2 2280 DS SSD	1.07	3.02	3.02	3.42	4.03	3.00	2280 M.2
875500-B21	HPE 960GB SATA RI M.2 2280 DS SSD	1.07	3.17	3.17	3.82	5.62	3.10	2280 M.2

NOTE: Please use HPE Selector Tool **http://ssd.hpe.com/** to determine server compatibility.

Technical Specifications

SAS Interface – Extended (Capacity, Workload, Carrier…)

NOTE:
The Server Gen Supported (Select Platforms) are Gen9 & 10
The Digitally Signed Firmware (DS) is set to "Yes"

HPE Option KIT SKU	Short Description	Capacity	Workload Type	Interface Type	Form Factor	Plug Type	Carrier Type	Flash Type
870144-B21	HPE 7.68TB SAS RI SFF SC DS SSD	7680	RI	SAS	SFF	Hot Plug	SC	TLC
870148-B21	HPE 15.3TB SAS 12G RI SFF SC DS SSD	15300	RI	SAS	SFF	Hot Plug	SC	MLC
872378-B21	HPE 800GB SAS 12G MU LFF SCC DS SSD	800	MU	SAS	LFF	Hot Plug	SCC	MLC
873349-B21	HPE 400GB SAS 12G WI SFF STD DS SSD	400	WI	SAS	SFF	Hot Plug	STD	MLC
873460-B21	HPE 800GB SAS 12G WI SFF STD DS SSD	800	WI	SAS	SFF	Hot Plug	STD	MLC

SAS Interface - Extended (Speeds & Feeds)

HPE Option KIT SKU	Lifetime Writes (TB)	Endurance DWPD	MAX Seq Reads Throughput (MiB/s)	MAX Seq Writes Throughput (MiB/s)	Random Read Average Latency uSec (4KiB,Q1)	Random Write Average Latency uSec (4KiB,Q1)	Random Read IOPS (4KiB, Q=16)	Random Write IOPS (4KiB, Q=16)	MAX Random Read IOPS (4KiB)	MAX Random Write IOPS (4KiB)
870144-B21	14,016	1.00	940	1,000	150	40	93,000	34,000	148,000 @Q64	34,000 @Q4
870148-B21	28,032	1.00	940	1,000	150	41	93,000	37,000	165,000 @Q128	37,000 @Q4
872378-B21	4,380	3.00	1,075	1,025	126	57	120,000	90,000	185,000 @Q32	90,000 @Q16
873349-B21	7	10.00	1,050	1,005	110	45	100,000	100,000	170,000 @Q64	100,000 @Q16
873460-B21	15	10.00	1,050	1,005	105	35	120,000	100,000	170,000 @Q64	100,000 @Q16

NOTE: Reference column VI-1 when comparing RI SSDs, & column VI-2 for comparing MU & WI SSDs.

Technical Specifications

SAS Interface - Extended (Power & Height)

HPE Option KIT SKU	Short Description	Power Idle Time	Power Random Read	Power Random Write	Power Sequential Read	Power Sequential Write	Power Random R/W	z-Height
870144-B21	HPE 7.68TB SAS RI SFF SC DS SSD	6.13	6.91	6.91	8.44	8.73	6.91	15mm
870148-B21	HPE 15.3TB SAS 12G RI SFF SC DS SSD	0.00	0.00	0.00	0.00	0.00	0.00	15mm
872378-B21	HPE 800GB SAS 12G MU LFF SCC DS SSD	3.06	4.07	4.07	6.28	8.22	4.07	15mm
873349-B21	HPE 400GB SAS 12G WI SFF STD DS SSD	3.46	5.86	5.86	5.65	8.08	5.86	15mm
873460-B21	HPE 800GB SAS 12G WI SFF STD DS SSD	3.61	6.19	6.19	6.63	10.65	6.19	15mm

NOTE: Please use HPE Selector Tool **http://ssd.hpe.com/** to determine server compatibility

Technical Specifications

PCIe/NVMe Interface – Extended SKUs (Capacity, Workload, Carrier…)

NOTE:
The Server Gen Supported (Select Platforms) are Gen9 & 10
The Digitally Signed Firmware (DS) is set to "Yes"

PE Option KIT SKU	Short Description	Capacity	Workload Type	Interface Type	Form Factor	Plug Type	Carrier Type	Flash Type
875597-B21	HPE 1.6TB NVMe x4 MU SFF SCN DS SSD	1600	MU	PCIe / PCIe NVMe	SFF	Hot Plug	SCN	MLC
877998-B21	HPE 3.2TB NVMe x4 MU SFF SCN DS SSD	3200	MU	PCIe / PCIe NVMe	SFF	Hot Plug	SCN	MLC
877984-B21	HPE 1TB NVMe x4 RI SFF SCN DS SSD	1000	RI	PCIe / PCIe NVMe	SFF	Hot Plug	SCN	MLC
877988-B21	HPE 4TB NVMe x4 RI SFF SCN DS SSD	4000	RI	PCIe / PCIe NVMe	SFF	Hot Plug	SCN	MLC
875591-B21	HPE 1.92TB NVMe x4 RI SFF SCN DS SSD	1920	RI	PCIe / PCIe NVMe	SFF	Hot Plug	SCN	MLC
877825-B21	HPE 1.6TB PCIe x4 MU HH DS Card	1600	MU	PCIe / PCIe NVMe	AIC	Non-Hot Plug	AIC	MLC
877827-B21	HPE 3.2TB PCIe x4 MU HH DS Card	3200	MU	PCIe / PCIe NVMe	AIC	Non-Hot Plug	AIC	MLC
877829-B21	HPE 6.4TB PCIe x4 MU HH DS Card	6400	MU	PCIe / PCIe NVMe	AIC	Non-Hot Plug	AIC	MLC
877831-B21	HPE 4TB PCIe x4 RI HH DS Card	4000	RI	PCIe / PCIe NVMe	AIC	Non-Hot Plug	AIC	MLC
875583-B21	HPE 400GB NVMe x4 MU M.2 22110 DS SSD	400	MU	PCIe / PCIe NVMe	M.2	N/A	N/A	MLC
875585-B21	HPE 800GB NVMe x4 MU M.2 22110 DS SSD	800	MU	PCIe / PCIe NVMe	M.2	N/A	N/A	MLC
875579-B21	HPE 480GB NVMe x4 RI M.2 22110 DS SSD	480	RI	PCIe / PCIe NVMe	M.2	N/A	N/A	MLC
875581-B21	HPE 960GB NVMe x4 RI M.2 22110 DS SSD	960	RI	PCIe / PCIe NVMe	M.2	N/A	N/A	MLC

Technical Specifications

PCIe/NVMe Interface – Extended SKUs (Speeds and Feeds)

HPE Option KIT SKU	Lifetime Writes (TB)	Endurance DWPD	MAX Seq Reads Throughput (MiB/s)	MAX Seq Writes Throughput (MiB/s)	Random Read Average Latency uSec (4KiB,Q1)	Random Write Average Latency uSec (4KiB,Q1)	Random Read IOPS (4KiB, Q=16)	Random Write IOPS (4KiB, Q=16)	MAX Random Read IOPS (4KiB)	MAX Random Write IOPS (4KiB)
875597-B21	9,900	3.00	2,400	840	100	32	140,000	40,000	245,000 @Q64	40,000 @Q16
877998-B21	17,050	2.92	3,200	1,400	86	17	155,000	185,000	585,000 @Q256	185,000 @Q16
877984-B21	1,330	0.73	3,200	1,900	87	26	135,000	38,000	295,000 @Q256	38,000 @Q1
877988-B21	4,600	0.63	3,200	1,900	83	23	170,000	62,000	680,000 @Q256	62,000 @Q4
875591-B21	3,150	0.30	2,390	850	100	62	140,000	16,500	240,000 @Q64	16,500 @Q1
877825-B21	8,700	5.00	5,700	2,145	80	22	180,000	130,000	900,000 @Q256	135,000 @Q32
877827-B21	17,500	5.00	6,400	2,800	80	22	180,000	160,000	900,000 @Q256	175,000 @Q32
877829-B21	35,000	5.00	6,400	2,800	80	22	180,000	160,000	900,000 @Q256	175,000 @Q32
877831-B21	4,600	0.63	3,200	1,900	83	23	170,000	62,000	680,000 @Q256	62,000 @Q4

NOTE: Reference column VI-1 when comparing RI SSDs, & column VI-2 for comparing MU & WI SSDs.

Technical Specifications

PCIe/NVMe Interface – Extended SKUs (Power & Height)

HPE Option KIT SKU	Short Description	Power Idle Time	Power Random Read	Power Random Write	Power Sequential Read	Power Sequential Write	Power Random R/W	z-Height
875597-B21	HPE 1.6TB NVMe x4 MU SFF SCN DS SSD	3.22	7.58	11.58	7.01	7.79	7.81	7mm
877998-B21	HPE 3.2TB NVMe x4 MU SFF SCN DS SSD	<5.00	9.00	15.60	9.41	19.00	12.00	15mm
877984-B21	HPE 1TB NVMe x4 RI SFF SCN DS SSD	<5.00	10.10	11.65	10.90	10.70	10.80	15mm
877988-B21	HPE 4TB NVMe x4 RI SFF SCN DS SSD	<5.00	12.50	14.80	9.50	18.30	13.50	15mm
875591-B21	HPE 1.92TB NVMe x4 RI SFF SCN DS SSD	3.22	3.63	12.07	4.52	12.07	6.52	7mm
877825-B21	HPE 1.6TB PCIe x4 MU HH DS Card	8.00	20.0	18.00	21.00	21.00	19.0	Half Height/ Half Length
877827-B21	HPE 3.2TB PCIe x4 MU HH DS Card	8.00	20.0	18.00	23.00	22.00	19.0	Half Height/ Half Length
877829-B21	HPE 6.4TB PCIe x4 MU HH DS Card	8.00	20.0	18.00	23.00	22.00	19.0	Half Height/ Half Length
877831-B21	HPE 4TB PCIe x4 RI HH DS Card	<5.00	14.80	17.70	10.70	20.50	16.10	Half Height/ Half Length
875583-B21	HPE 400GB NVMe x4 MU M.2 22110 DS SSD	0.00	0.00	0.00	0.00	0.00	0.00	22110 M.2
875585-B21	HPE 800GB NVMe x4 MU M.2 22110 DS SSD	0.00	0.00	0.00	0.00	0.00	0.00	22110 M.2
875579-B21	HPE 480GB NVMe x4 RI M.2 22110 DS SSD	0.00	0.00	0.00	0.00	0.00	0.00	22110 M.2
875581-B21	HPE 960GB NVMe x4 RI M.2 22110 DS SSD	0.00	0.00	0.00	0.00	0.00	0.00	22110 M.2

NOTE: Please use HPE Selector Tool **http://ssd.hpe.com/** to determine server compatibility

Inbox NVMe Drivers

Technical Specifications

Inbox NVMe drivers for the operating systems listed below have been tested on HPE NVMe SSDs and Add-in Cards. Check the specifications for the HPE server of interest to determine if it supports one of these Operating Systems.

- Windows Server 2016
- Windows Server 2012R2
- Red Hat Enterprise Linux Server 6.5
- Red Hat Enterprise Linux Server 7.0
- SUSE Linux Enterprise Server 12
- Ubuntu 14.04
- VMWare vSphere 6.1

Previous To Current Workload Naming Conversion

Please use the table below for comparing older SSD models to the newer workload based schema.

Previous Workload	Current Workload Alignment
(HE) High Endurance	**(WI)** Write Intensive (>25 DWPD)
(ME) Mainstream Endurance	**(WI)** Mixed-Use (>10 DWPD)
(LE) Light Endurance	**(MU)** Mixed Use (>1 & <10 DWPD)
(VE) Value Endurance	**(RI)** Read Intensive (<=1 DWPD)

Carrier Key Decoder

HPE Solid State Drives (SSDs) utilize a wide variety of carriers, which houses the SSD and also enables a specific chassis fit to support a broad range of HPE server and storage products.

The table below summarizes the various form factors, plug types, and carrier attributes noted earlier in this document within SSD SKU Decoder.

Carriers				
Form Factor	**HP/NHP**	**Smart/Non-Smart**	**Carrier Name (Abbreviation)**	**SFF/LFF**
SFF Carrier	Hot Plug	Smart	Smart Carrier **(SC)**	SFF
			Smart Carrier NVMe **(SCN)**	SFF
			Smart Carrier M.2 **(SCM)**	SFF
		Non-Smart	Standard **(ST)**	SFF
	Non-Hot Plug		Quick Release **(QR)**	SFF
LFF Carrier	Hot Plug	Smart	Smart Carrier **(SC)**	LFF
			Smart Carrier Converter **(SCC)**	LFF
		Non-Smart	Low Profile **(LP)**	LFF
			Low Profile Converter **(LPC)**	LFF
			Standard **(ST)**	LFF
	Non-Hot Plug		Quick Release **(QR)**	LFF
No Carrier	Non-Hot Plug	Non-Smart	Raw SFF HDD/SSD **(RW)**	SFF
			Raw LFF HDD **(RW)**	LFF
			M.2	N/A
			PCIe AIC Card	N/A

Technical Specifications

The following charts are provided to assist in decoding the PCIe/NVMe, M.2, and AIC short & long product descriptions; additional details can also be found within the Carrier Key Decoder & the Previous To Current Workload Naming Conversion tables within this document.

The following charts are provided to assist in decoding the SSD SAS and SATA SSD short & long product descriptions; additional details can also be found within the Carrier Key Decoder & the Previous To Current Workload Naming Conversion tables within this document.

SAS and SATA SSD SKU Decoders

SSD SKU Decoder
Long Name

HPE 3.84TB SATA 6G Read Intensive SFF (2.5in) SC 3yr Wty Digitally Signed Firmware SSD

Brand	Storage Capacity	Interface Type/ Interface Speed	Workload	Form Factor Type / Form Factor Size	Carriers	Wty	Special Features	Drive Type
HPE	120-960GB 1.6-12.8TB	SATA/SAS 6G/12G	Write Intensive Mixed Use Read Intensive	SFF (2.5IN) LFF (3.5IN)	SC Smart Carrier SCN Smart Carrier NVMe SCM Smart Carrier M.2 SCC Smart Carrier Converter ST Standard STC Standard Converter LP Low Profile LPC Low Profile Converter QR Quick Release RW Raw Drive	3yr Wty 1yr Wty	DS Digitally Signed Firmware SED Self Encrypting Drive *TBD Low Power* *In priority order where 1st is closest to Drive Type*	SSD

SSD SKU Decoder
Short Name

HPE 3.84TB SATA RI SFF SC DS SSD

Brand	Storage Capacity	Interface Type	Workload	Form Factor Type	Carriers	Special Features	Drive Type
HPE	120-960GB 1.6-12.8TB	SATA/SAS	WI MU RI	SFF LFF	SC Smart Carrier SCN Smart Carrier NVMe SCM Smart Carrier M.2 SCC Smart Carrier Converter ST Standard STC Standard Converter LP Low Profile LPC Low Profile Converter QR Quick Release RW Raw Drive	DS Digitally Signed Firmware SED Self Encrypting Drive *In priority order where 1st is closest to drive type*	SSD

Technical Specifications

NVMe SSDs SKU Decoder
Long Name

HPE 1TB NVMe x4 Lanes Read Intensive SFF (2.5in) SCN 3yr Wty Digitally Signed Firmware SSD

Brand	Storage Capacity	Interface Type/ Interface Speed	Workload	Form Factor Type / Form Factor Size	Carriers	Wty	Special Features	Drive Type
HPE	400-960GB 1-8TB	NVMe/ x4 Lanes	Write Intensive Mixed Use Read Intensive	SFF (2.5IN) HHHL/FHHL	SCN Smart Carrier NVMe	3yr Wty 1yr Wty	DS Digitally Signed Firmware DP Dual Port *In priority order where 1st is closest to Drive Type*	SSD

NVMe SSDs SKU Decoder
Short Name

HPE 1TB NVMe x4 RI SFF SCN DS SSD

Brand	Storage Capacity	Interface Type	Workload	Form Factor Type	Carriers	Special Features	Drive Type
HPE	120-960GB 1.6-12.8TB	NVMe x4	WI MU RI	SFF HH FH	SCN Smart Carrier NVMe	DS Digitally Signed Firmware DP Dual Port *In priority order where 1st is closest to Drive Type*	SSD

M.2 SSDs SKU Decoder
Long Name

HPE 960GB NVMe x4 Lanes Read Intensive M.2 2280 3yr Wty Digitally Signed Firmware SSD

Brand	Storage Capacity	Interface Type/ Interface Speed	Workload	Form Factor Type / Form Factor Size	Wty	Special Features	Drive Type
HPE	400-960GB 1-8TB	NVMe x4 Lanes/ SATA 6Gb	Write Intensive Mixed Use Read Intensive	M.2/ 2280/22110	3yr Wty 1yr Wty	DS Digitally Signed Firmware	SSD

M.2 SSDs SKU Decoder
Short Name

HPE 960GB NVMe x4 Lanes RI M.2 2280 DS SSD

Brand	Storage Capacity	Interface Type/ Interface Speed	Workload	Form Factor Type / Form Factor Size	Special Features	Drive Type
HPE	400-960GB 1-8TB	NVMe x4 / SATA 6Gb	WI MU RI	M.2/ 2280/22110	DS Digitally Signed Firmware	SSD

Technical Specifications

M.2 eKits SKU Decoder
Long Name

HPE 340GB SATA Read Intensive HHHL 3yr Wty Dual M.2 Kit

Brand	Storage Capacity	Interface Type/ Interface Speed	Workload	Form Factor Type / Form Factor Size	Wty	Special Features	Drive Type
HPE	150-960GB 1.92TB	SATA/ NVMe	Write Intensive Mixed Use Read Intensive	HHHL FHHL UFF	3yr Wty 1yr Wty	Dual Quad Blank=Single	M.2 Kit

M.2 eKits SKU Decoder
Short Name

HPE 340GB SATA RI HH Dual M.2 Kit

Brand	Storage Capacity	Interface Type/ Interface Speed	Workload	Form Factor Type / Form Factor Size	Special Features	Drive Type
HPE	150-960GB 1.92TB	SATA/ NVMe	WI MU RI	HH FH UFF	Dual Quad Blank=Single	M.2 Kit

Add-In Card SKU Decoder
Long Name

HPE 1.6TB PCIe x4 Lanes Read Intensive HHHL 3yr Wty Digitally Signed Firmware Card

Brand	Storage Capacity	Interface Type/ Interface Speed	Workload	Form Factor Type / Form Factor Size	Wty	Special Features	Drive Type
HPE	400-960GB 1-8TB	PCIe x4 Lanes	Write Intensive Mixed Use Read Intensive	HHHL FHHL Mezz	3yr Wty 1yr Wty	Digitally Signed Firmware	Card

AIC SKU Decoder
Short Name

HPE 1.6TB PCIe x4 RI HH DS Card

Brand	Storage Capacity	Interface Type/ Interface Speed	Workload	Form Factor Type / Form Factor Size	Special Features	Drive Type
HPE	400-960GB 1-8TB	PCIe x4	WI MU RI	FH/HH Mezz	DS (Digitally Signed Firmware)	Card

Technical Specifications

Environment friendly Products and Approach End-of life Management and Recycling	Hewlett Packard Enterprise offers end-of-life **product return, trade-in, and recycling programs**, in many geographic areas, for our products. Products returned to Hewlett Packard Enterprise will be recycled, recovered or disposed of in a responsible manner. The EU WEEE Directive (2012/19/EU) 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**. 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 Hewlett Packard Enterprise equipment.

Summary of Changes

Date	Version History	Action	Description of Change
5-Feb-2018	Version 14	Revise	Format Revised
		Added	New drive models added
4-Dec-2017	Version 13	Added	New drive model was added.
		Changed	Technical Specifications were revised.
02-Oct-2017	Version 12	Changed	Technical Specifications were revised.
25-Sep-2017	Version 11	Added	New drive models were added.
		Changed	Technical Specifications were revised. The title was changed to HPE Solid State Disk Drives (SSD & Add-In Cards).
14-Aug-2017	Version 10	Changed	Technical Specifications were revised
07-Aug-2017	Version 9	Changed	Technical Specifications were revised
17-Jul-2017	Version 8	Changed	Technical Specifications were revised
28-Jun-2017	Version 7	Changed	Technical Specifications were revised.
12-Jun-2017	Version 6	Changed	Technical Specifications were revised.
06-Jun-2017	Version 5	Changed	Technical Specifications were revised.
17-Mar-2017	Version 4	Changed	SSD Selection verbiage was revised.
10-Mar-2017	Version 3	Changed	Edits to tables and various verbiage.
17-Feb-2017	Version 2	Changed	Technical Specifications were revised.
13-Feb-2017	Version 1	Added	New QuickSpecs.

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