Hewlett Packard Enterprise

HPE Solid State Drives (SSDs)

Accelerate the performance of your data intensive applications

It is estimated that 2.5 exabytes (a billion gigabytes) of data are created every day. To tap the potential of Big Data, applications must read and write more data, faster than ever. HPE Solid State Drives help you access data faster by providing exceptional performance, extended endurance, and consistently low latency—all while using less power.

And with current transitions in the Hard Disk Drive (HDD) industry, many customers are now experiencing the great performance of SSDs at competitive pricing, especially for capacities under 1 TB.

Peak performance for random data applications

HPE SSDs are suited to enterprise environments with highly random data under a variety of write-workload applications. SSDs provide significantly better random read and write I/O operations per second (IOPS) compared to HDDs. While sequential read and write throughput is also improved over HDDs, the greatest benefit is recognized in random data applications. As a result, these high-performance, low-latency, and low-power SSDs provide significant system benefits for applications that previously over-provisioned HDD capacity to achieve better performance.

Enterprise features for data center applications

HPE Solid State Drives have key features you need in your data center—full data path error detection, surprise power loss protection, and HPE SmartSSD Wear Gauge support. We enable the SmartSSD Wear Gauge through the HPE Smart Carrier. With the SmartSSD Wear Gauge utility, HPE SSDs monitor the amount of data written and report when the device may be nearing its maximum supported lifetime.

Targeted at extreme operating environments or local storage, these drives provide higher I/O throughput, excellent latency, reduced power consumption, enhanced reliability, and faster reads and writes when compared to traditional rotating media. They remove the latency found in conventional rotating HDDs caused by seek time for each read operation, so they deliver high random read performance. Most SSDs are available in small form factor (SFF 2.5), large form factor (LFF 3.5), for general use across the HPE ProLiant Server portfolio. The drives are fully qualified and fit seamlessly into the existing HPE server infrastructure.

With no moving parts, more reliability, and greater power savings than traditional rotating media drives, SSDs are finding new applications in the Big Data era.

Compatible with your server environment

HPE SSDs are fully tested and qualified to enable compatibility with HPE ProLiant, HPE Synergy, and HPE BladeSystem solutions. HPE SSDs are among the best of the best compared to products available on the open market. HPE firmware optimizes our qualified SSD performance, wear leveling, and over-provisioning.

The right SSD for every application

HPE SSDs are available in three broad categories based on their typical target workloads: Read Intensive, Mixed Use, and Write Intensive.

The workloads indicate the number of drive writes per day (DWPD[1]) that you can expect from the drive. (DWPD is the maximum number of 4 K host writes to the entire drive capacity of the SSD per day over a five-year period.)

Read Intensive SSDs are typically the lowest price, with a typical Endurance of <= 1 DWPD. Write Intensive SSDs typically have the highest Write performance, with a typical Endurance of >= 10 DWPD. Mixed Use SSDs are for workloads that need a balance of strong Read and Write performance, with Endurance typically >1 and <10 DWPD.

HPE Qualified Options—HPE Solid State Drives

Table 1. HPE SSDs categories

	Write intensive	Mixed use	Read intensive
Interface	SAS, SATA, PCIe/NVMe, M.2	SAS, SATA, PCIe/NVMe, M.2	SAS, SATA, PCIe/NVMe, M.2
Endurance	>=10 DWPD	>1 and <10 DWPD	<=1 DWPD
Typical workload	High read/write applications	Mixed read/write applications	High read/low write applications

HPE Write Intensive Solid State Drives

HPE Write Intensive 12G SAS and 6G SATA SSDs provide high write performance and endurance. They are best suited for mission-critical enterprise environments with workloads high in read and writes. Write Intensive workloads include online transaction processing (OLTP) include online transaction processing (OLTP), virtual desktop infrastructure (VDI), business intelligence, and Big Data Analytics.

HPE Mixed Use Solid State Drives

HPE Mixed Use 12G SAS and 6G SATA SSDs are best suited for high I/O applications with workloads requiring balanced performance between reads and writes. When paired with HPE ProLiant servers, these SSDs help you meet the challenges of Big Data.

[1] DWPD = Full drive writes per day for 5 years

HPE Read Intensive Solid State Drives
HPE Read Intensive 12G SAS and 6G SATA SSDs deliver enterprise features at an affordable price in HPE servers. Entry-level pricing is fueling the rapid adoption of SSDs for read-intensive workloads, because the cost per IOPs compares favorably to HDDs. Read Intensive SSDs deliver great performance for workloads high in reads such as boot/swap, Web servers, and read caching, just to name a few.

HPE Read Intensive M.2 Solid State Enablement Kits
The HPE M.2 Solid State Enablement Kit is recent addition to our Read Intensive solid state drive family and is best suited for boot/swap. The M.2 Solid State Enablement Kit is available in dual and single 64 GB and 120 GB capacities. The kits are compatible to ProLiant Gen9 Blades and currently support a 6 Gb SATA interface. Also, the dual and single 120 GB and 340 GB capacities are available in the M.2 Enablement Kit and currently supports ProLiant ML/DL servers.

SAS or SATA interface available
Hewlett Packard Enterprise has a full portfolio of 12 Gb/s SAS SSDs. The SAS SSDs transfer data at full duplex (bidirectional) allowing greater I/O bandwidth to alleviate bottlenecks. Additionally SAS uses SCSI commands for error recovery and error reporting, which have more functionality than the ATA command set used by Serial ATA (SATA). Hewlett Packard Enterprise has a 12 Gb/s SAS Expander to scale storage capacity for multi-workload needs. SATA SSDs are great in half-duplex (unidirectional) direct connect scenarios when lower price is a priority.

Boost performance with HPE NVMe PCIe 2.5" SSDs
With the introduction of NVMe, an industry interface specification for accessing solid-state storage through PCI Express, manufacturers have a set of guidelines that seeks to release them from the limitations of previous standards, and also provides a wide range of interoperability benefits. HPE NVMe PCIe 2.5" SSDs talk directly to your applications via the PCIe bus, boosting I/O bandwidth and reducing latency to scale performance in line with your processing requirements. This means, for example, that you can host your entire database on one or more HPE NVMe PCIe 2.5" SSDs for enhanced in-memory access and performance. NVMe, or Non-Volatile Memory Express, is a from-the-ground-up industry specification that focuses on efficiency, scalability, and performance.

Key features and benefits

Higher performance and better latency
HPE SSDs enable rapid reads and writes of transactional data. On an HDD, random reads require constant repositioning of the read/write head to seek the exact location of data on the platter before the data transfer can begin. However, SSDs have no moving parts or rotating platters that can cause latency problems, and that results in faster access to data. Therefore, with faster seek times, the drives achieve high IOPS, producing quicker data access and better latency.

The drives also pack the operating performance of several rotating HDDs into the same space as a single HDD, so you can get more performance out of your existing data center.

Lower power consumption
Steadily increasing storage requirements pose power and performance challenges to data centers. Solid state devices have a significantly better performance-to-power rating than traditional rotating HDDs. The lack of a motor greatly reduces an SSD's power consumption, so the drives draw less energy—less than two watts idle and less than nine watts maximum.

Environmental ruggedness
The inherent environmental ruggedness of SSDs makes them well suited for extreme environments where traditional drives cannot operate. The drives can tolerate significantly higher operating shock and vibration levels compared to traditional rotating HDDs. In fact, they virtually eliminate rotational vibration problems.

Resources

See **QuickSpecs** for more product details.

Customize your IT lifecycle management, from acquisition of new IT, management of existing assets, and removal of unneeded equipment. **hp.com/go/hpfinancialservices**

HPE Factory Express provides customization and deployment services along with your storage and server purchases. You can customize hardware to your exact specifications in the factory—helping speed deployment. **hp.com/go/factoryexpress**

Gain the skills you need with ExpertOne training and certification from HPE. With HPE ProLiant training, you will accelerate your technology transition, improve operational performance, and get the best return on your HPE investment. Our training is available when and where you need it, through flexible delivery options and a global training capability. **h10076.www1.hpe.com/ww/en/training/portfolio/proliant.html**

High reliability
Reliability is important for any storage medium, and it is essential when considering a storage device that can be used in servers. HPE SSDs pass a rigorous HPE ProLiant qualification of 2.4 million test hours.

Investment protection
HPE SSDs are a drop-in replacement for existing HDDs. They fit into existing HDD hot-plug bays and require no modification to operating system or infrastructure tools. The drives are recognized as standard SAS or SATA devices with no special changes in firmware or hardware. Although you cannot mix SSDs and HDDs in the same logical array, you can mix them within the system to provide a more effective use of both technologies.

Technical specifications

HPE SSDs come in a range of performance, endurance, and interface options.

For more information see the HPE SSD Quick Specs: **hpe.com/h20195/v2/GetPDF.aspx/c04154378.pdf**

Enable your success with HPE support services

Simplify implementation and support of your server solution.
To streamline installation and enhance ongoing support, Hewlett Packard Enterprise recommends the following service offerings:

- HPE Installation and Startup Service—HPE Services offers complete installation and implementation support—including global rollout capabilities—to get your HPE server-based solution up and running rapidly, with reduced business disruption. You can choose from all server options and storage for inclusion in the server: Microsoft®, Linux®, Solaris, and VMware® operating software, plus HPE Insight Control software management solutions.
- Hardware support—You can cover all the options installed in your server with a single convenient service package. HPE Care Pack Services for HPE ProLiant servers and storage systems provide support for all HPE-branded hardware options qualified for inclusion in your server at the time of purchase or afterward. Any additional HPE-Qualified Options installed within the server are covered at the same service level and for the same period as the server.

Learn more at
hpe.com/servers/solidstate

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