Hewlett Packard Enterprise

Empower data at the speed of memory

HPE Memory-Driven Flash

Achieve outstanding application performance and ultra-low latency for mixed workloads; unleash a new wave of insights and innovation with the world's most intelligent storage[1]

Inconsistent latency leads to unpredictable outcomes

Every day the amount of data created across the world is exploding to new levels. However, data is only transformative when it can be refined and accessed at the right place and at the right time, driving actionable insights to outpace the competition.

To unlock the full potential value from your data, you need to operate in real time. Analytics-oriented workloads that leverage artificial intelligence and machine learning (AI/ML) are time sensitive for user experience and decision-making, and can't afford latency.

According to IDC, "The single biggest concern enterprises identify is performance predictability. Not only do enterprises require predictably low latencies, but they need to ensure that they can continue to meet defined service-level agreements (SLAs) as their environments scale."[2]

Turbocharged with storage-class memory

HPE Memory-Driven Flash is a new class of enterprise storage that enables every business to take advantage of the disruptive speed of memory, unleashing a new wave of insights and innovation. For HPE 3PAR and

[1] **HPE Storage**

[2] "Enterprise Storage Evolves Beyond All Flash with Storage-Class Memory, Unleashing a New Generation of Innovation," IDC white paper, IDC, sponsored by HPE, Nov 26, 2018.

Start fast

up to 2X improved latency[6]
up to 50% faster than NVMe all-flash arrays[7]

Stay fast

Average sub-200 µs latency[8]
Near 100% IO less than 300 µs[9]

[3] Based on comparisons between memory technologies on in-market product specifications and internal Intel® specifications by Storage Technologies Group, Intel as of 2017.

[4, 7] Based on HPE internal testing of HPE 3PAR compared to published latency values from Dell PowerMax as of Nov 26, 2018.

[5, 8, 9] Based on HPE internal testing as measured by the host application using an HPE 3PAR 9450 system running an 8 KiB random read workload and an HPE Nimble Storage AF80 running a 4 KiB random read workload. Note that the HPE 3PAR system was also at 2X the IOPS as of 2018.

[6] Based on HPE internal testing of HPE storage once Memory-Driven Flash is enabled.

HPE Nimble Storage, HPE Memory-Driven Flash consists of the following elements:

Intelligent software-based acceleration
Self-optimizing algorithms built into HPE 3PAR and HPE Nimble Storage get the most out of any media. The two platforms have over twenty years of experience of efficiently supporting tiered storage environments with intelligent software-based acceleration. Hewlett Packard Enterprise has customized our access patterns based on real customer data gathered through HPE InfoSight.

Memory driven
Storage-class memory (SCM) represents the future of low latency persistent storage media and closes the performance gap between DRAM and NAND. DRAM is far too expensive to scale, and while NAND has the capacity and cost structure to scale, it lacks sufficient performance to function in the memory space.

The performance of SCM is measured in tens of microseconds. Its orders of magnitude (10X) faster than NAND and approaches the performance levels of DRAM, but at a lower cost and higher density compared to DRAM.[3]

Parallel processed
NVMe, a modern storage protocol alternative to SCSI, is designed for extensive parallelism, concurrency and scalability. To reap the full benefits of NVMe, you need a scale-out active/active architecture deployed with high-speed modern media.

Flash storage
Flash helped transform storage with significant performance enhancements over spinning media. SSDs are now deployed as a capacity tier in conjunction with memory.

Breakthrough application performance

HPE Memory-Driven Flash helps you drive better business insights and respond faster to customers with real-time processing.

Compared to NVMe all-flash arrays, HPE Memory-Driven Flash is up to 50% faster.[4] It's ideal for providing a turbo boost to your transactional OLTP and database workloads, or emerging workloads like real-time and data-intensive analytics applications.

Unmatched predictability

HPE Memory-Driven Flash is an efficient shared storage solution for mixed workloads and multitenant environments. It prevents a few applications using a disproportionately large amount of shared resources and natively impacting the performance of other applications within the same infrastructure. With HPE Memory Driven-Flash, you are assured of delivering ultra-low latency at scale. For example, HPE 3PAR and HPE Nimble Storage are capable of delivering sub 300 microsecond latencies for near 100% of all I/Os.[5]

Simple and nondisruptive to upgrade

HPE 3PAR and HPE Nimble Storage were designed with investment protection from day one. Both platforms easily adapt to new technologies for up to date and modern storage.

HPE Memory-Driven Flash is built on the timeless architectures of HPE 3PAR and HPE Nimble Storage. HPE Memory-Driven Flash does not require a forklift upgrade, replacement of storage media, or data migrations. It breaks the performance barrier and unlocks the value of data through the world's most intelligent storage.

Memory speed is no a longer a vision but a reality that's available today. HPE Memory-Driven Flash is currently available for HPE 3PAR with planned availability for HPE Nimble Storage in 2019.

Learn more at
hpe.com/memorydrivenflash

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