Hewlett Packard Enterprise

Microsoft SQL Server on HPE Memory-Driven Flash

High-performance storage for SQL Server environments

Business-critical application performance and cost control have long been challenges for many organizations.

Recent research conducted by HPE validates the key advantages of running SQL Server transactional workloads on HPE 3PAR all-flash storage with SCM:

- **Lower read latencies:** OLTP workloads benefit from significantly reduced read latencies with HPE Memory-Driven Flash enabled on an HPE 3PAR array.

- **Lower idle times, increased processor utilization:** Lower read latencies allow SQL Server to complete queries faster.

- **Increased read cache:** HPE Memory-Driven Flash using Non-Volatile Memory Express (NVMe) SCM reduces read response times for larger data sets than normal DRAM can contain.

Breakthroughs are needed

Three things have been changing: the intensity of increasingly digitized businesses and global, 24x7x365 operations; growth in data and demand is increasing in both scale and amplitude; and growing management complexity of virtualized and clustered infrastructure resources. These pressures can result in insufficient performance to meet decision support requirements, inflexibility to accommodate changing business needs, and budget constraints that impose innovation-limiting trade-offs.

IT organizations need ways to consistently deliver performance for strained database deployments, yet maintain operational simplicity and meet the demands of the business with the resources available. Breakthroughs in technology are needed to accomplish more with less.

HPE Memory-Driven Flash and SQL Server solution

An HPE Memory-Driven Flash and Microsoft® SQL Server® solution provides a high-performance platform for demanding database deployments. HPE Memory-Driven Flash is a new storage category that introduces a new type of storage cache—Storage Class Memory (SCM)—that cuts system latency in half, significantly speeding database performance, but adds minimal system cost. And as an embedded system component, it brings almost no additional administrative complexity.

The value of flash storage for SQL Server

SQL Server offers customers an industry-leading OLTP solution, data protection with the Always Encrypted feature, and the ability to analyze operational data using SQL Server R Services and to build mission-critical applications both on-premises and in a hybrid cloud. To take advantage of these capabilities and further speed SQL Server transactions, customers need to deploy a resilient and flexible data storage infrastructure.

To help ensure SQL Server admin efficiency, integrated data storage solutions need to be simple and low maintenance. As your business grows, you need a flexible solution that is scalable and high performing, and that does not require costly maintenance. All-flash storage solutions accelerate SQL Server applications by delivering the IOPS, latency, and throughput necessary for mission-critical applications. Whether you run a virtualized or physical instance of SQL Server, having a resilient and flexible storage infrastructure is the key foundational component of the solution.

SQL Server meets the power of memory

HPE Memory-Driven Flash is the first enterprise storage that takes advantage of the disruptive speed of memory. Available for the world's most intelligent storage,[1] HPE Memory-Driven Flash

[1] **HPE Storage Substantiation**

50%

Faster than with just all-flash arrays with NVMe SSDs based on internal testing.

combines software intelligence, SCM, and NVMe for never-before-seen application performance—up to 50% faster than with just all-flash arrays.[2] HPE is using Intel® Optane™ nonvolatile memory technology for the SCM storage devices.

Close the performance gap

Achieve outstanding application performance and ultra-low latency for SQL Server with the benefits of HPE Memory-Driven Flash:

- **New class of enterprise array:** HPE Memory-Driven Flash is a new class of enterprise storage that enables businesses to take on new workloads such as real-time analytics, high-speed transactions, Big Data, and AI that demand more storage performance than ever before.

- **Low latency persistent storage:** SCM closes the performance gap between DRAM and NAND with performance measured in tens of microseconds, which is orders of magnitudes faster than NAND. SCM approaches the performance levels of DRAM, but at a lower cost.

- **Parallel processed:** NVMe is a modern storage protocol alternative to SCSI that is designed for extensive parallelism, concurrency, and scalability. It is used within HPE Memory-Driven Flash as part of a cutting-edge, scale-out active/active architecture.

SCM is changing the way data is stored

HPE Memory-Driven Flash helps you drive better business insights and respond faster to customers with real-time processing. HPE Memory-Driven Flash reduces latency by half—in the case of this specific research, by 59%.[3] Memory-Driven Flash storage systems with SCM media are ideal for providing a turbo boost to SQL Server, whether for transactional OLTP, other database workloads, or related real-time analytics applications.

Research shows that the decreased read response time delivered by SCM when used as a tier of cache memory directly benefits SQL Server databases.

HPE delivers the world's most intelligent storage

HPE delivers the world's most intelligent storage for your hybrid cloud. Achieve up to an 85% increase in IT efficiency with AI powered by **HPE InfoSight**, and also get 99.9999% guaranteed availability.[4]

This workload-optimized flash portfolio provides the ultimate destination for all data types and an architectural foundation for seamless data mobility. The HPE Storage portfolio includes HPE 3PAR StoreServ Storage for Tier 1 application performance, HPE Nimble Storage for effortless manageability, HPE Apollo Storage for scale-out performance and breakout efficiency for large data sets, and HPE MSA Storage for entry-level block storage SANs.
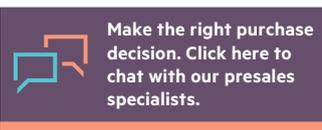
Get started

Get the most performance for your SQL Server environment on HPE Memory-Driven Flash storage systems. 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 publishes reference architectures and Microsoft certifications across its storage platforms that are available online to help you start planning your deployment today.

Learn more at
hpe.com/storage/microsoft

[2] Based on internal testing of HPE 3PAR compared to published latency values from Dell® PowerMax as of November 26, 2018.

[3] **Optimizing Microsoft SQL Server 2017 with HPE 3PAR storage and HPE Memory-Driven Flash**, March 2019.

[4] Based on HPE Nimble Storage's installed base. Find more details from **HPE InfoSight**.

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