PAVILION

ORACLE

Benefits

- Industry-leading performance
- The ONLY high-performance storage using NVMe/TCP and NVMe/RoCE drivers certified for both Microsoft Windows and VMware vSphere
- Future-proofed design that is ½ as costly as Fibre Channel
- 25X more affordable per I/O than nearest competitor
  - Saves on TCO
- 1/2 rack size of the nearest competitor
  - Saves datacenter footprint
- Protects Oracle and the business
- Reduces cost of using large cloud-scale Oracle deployments
- Better Oracle performance than using NVMe SSDs in a server
  - 2.3X transactions per minute
  - 2.3X operations per minute
- Unified file support provides Oracle operations flexibility and eliminates separate storage islands
- Enterprise design and data integrity validation ensures Oracle can reliably access data

Features

- Data integrity validation for Oracle applications
- Multi-Platform
- Simultaneous protocol support
  - NVMe-oF using VMware and Windows certified NVMe/TCP, NVMe/RDMA drivers
  - NVMe-oF using the industry standard NVMe/RDMA in Linux
  - iSCSI, NFS, SMB, S3, and Kerberos CSI protocols for other Linux, Windows, and VMware applications
- Linearly scales performance and capacity, simultaneously
  - Grow from high to ultra-high performance
  - Grow from terabytes to multi-petabytes
- Unified block, file, and object
  - NFS & S3 Global Namespace
- Intuitive management
  - Web GUI, vCenter plug-in, Kubernetes, REST API, OpenStack, DTMF/Redfish, and Swordfish

NVMe-oF Storage for Oracle

Enhance Your Oracle Data Infrastructure

Modern applications are data-intensive, and demands on the underlying Oracle database and data infrastructure require high performance, low latency, and high throughput. Storage bottlenecks often don't allow Oracle to perform the way it can and should. By optimizing Oracle's environment, DBAs can focus on designing and developing new and innovative applications instead of spending time focusing on solving data storage bottlenecks and database slowdowns.

The DBA role is not going away anytime soon. Industries are demanding more data services from their Oracle databases. Decisions get even more complicated when you add in multiple applications and databases. Today, a DBA's role is about making data accessible, the data that keeps your business running and competitive. Businesses need to analyze data in real time to make smart, fast decisions for a competitive advantage. Don't think about storage--eliminate storage bottlenecks, and get on with business.

A SAN-attached all-flash array (AFA) is the predominant Oracle storage solution in most data centers today. Many AFAs are derived from legacy architectures or based on Fibre Channel technology that is double the price of Ethernet and lacks the future growth and performance of the Ethernet-based design used by Pavilion.

Oracle benefits when the underlying storage system proves high performance, high throughput, and low latencies with high IOPS. Adding NVMe drives to the dual controller platform in many AFAs does not unlock the full performance of NVMe SSDs and can limit Oracle's parallelism and performance. A dual controller architecture may increase Oracle's latency during high I/O load, causing storage bottlenecks. Many customer's spread Oracle's I/O load across multiple AFAs to support the parallelism required. This raises challenges in scaling and consolidating Oracle, requiring businesses to use multiple AFAs to support their multiple Oracle instances, increasing complexity and TCO.

Instead, use the Pavilion HyperParallel™ Data Analytics Acceleration Platform, composed of the HyperParallel Flash Array and HyperOS™ to move Oracle's performance bottleneck *away* from storage, which enables you to more than double transactions and operations per minute. One Pavilion platform provides the same I/Os per dollar as 25 AFAs from the nearest competitor, and Pavilion's compact form factor is 50% smaller too.

Scalable and Flexible Performance Through NVMe-oF

Today, Pavilion is the ONLY high-performance storage company using NVMe/TCP and NVMe/RoCE drivers certified for both Microsoft Windows and VMware vSphere. Of course, Pavilion started the NVMe-oF trend with the industry's first NVMe-oF patent in 2014 (Non-volatile memory express over ethernet) and leads the industry in performance. The Pavilion hardware and software were architected in parallel from the ground up for NVMe. The Pavilion platform is superior to DAS, SDS, and AFAs and provides better than native NVMe performance to Oracle, boosting applications like order processing, storing data on a petabyte scale, or performing analytics. Pavilion speeds these Oracle applications on Linux, VMware, and Windows, enabling actionable insights in a short amount of time from big and fast data workloads.

The patented architecture of the Pavilion platform's high performance and ultra-low latency lets IT better deploy server resources to reduce rack space, power, and HVAC costs. Its multi-controller design enables Oracle customers to architect their databases to avoid hot spots, support more users/processes, achieve continuous operations, and shatter backup windows.

It's not about ripping-and-replacing your existing servers and networks. It *is* about enhancing your business with NVMe-oF and supporting additional functionality as business needs change. Replace existing storage with the Pavilion platform and see performance double and latency cut in half.

Accelerate Oracle on Oracle Enterprise Linux, VMware, and Windows. Pavilion uses native NVMe-oF drivers on Oracle Enterprise Linux and is the only storage array with certified NVMe/TCP and NVMe/RDMA drivers for VMware and Windows. Pavilion gives you a certified choice that decreases risk and boosts performance.

This revolutionary storage system offers the most performant, dense, scalable, and flexible storage in the universe. It scales linearly from high performance, low latency, and terabyte capacity to ultra-high performance, sub-microsecond latency, and multi-petabyte capacity, all in a dense 4RU form factor--and the DBA plays a major role.

The Pavilion HFA provides Oracle applications with performance that is better than relying on NVMe SSDs in a server. It can handle 72 NVMe SSDs and multiple concurrent block and file protocols with NVMe/TCP, NVMe/RDMA, iSCSI, NFS (v3, v4, pNFS, and RDMA), the Kubernetes CSI driver, and S3. VMware 7U3 has certified native drivers for NVMe/TCP, NVMe/RDMA (RoCE v2), iSCSI, and NFS. The Pavilion platform uses native NVMe-oF drivers in Oracle Enterprise Linux. This allows customers to change between Linux, Windows, and VMware without having to swap out their storage platform.

For example, a typical customer server was installed with Oracle Enterprise Linux (version 8.5), Oracle database (version R6) and HammerDB v4.4. The HammerDB TPC-C test suit was used for all Oracle configurations. The Oracle DB was configured to use the server's NVMe SSDs, then Oracle was configured to point to the NVMe SSDs in Pavilion, and they were accessed using the NVMe/RDMA driver of Oracle Enterprise Linux. The testing was repeated with the server running VMware 7U2 using the VMware certified Pavilion NVMe/RDMA (RoCE v2) driver.

Testing on both bare metal and virtualized Oracle showed that Oracle with the Pavilion platform's NVMe-oF support delivered better results than the same server using INTERNAL NVMe drives. On bare metal, Oracle saw 2.3X the transactions per minute (TPM) and 2.3X more operations per minute (NOPM), and under VMware Oracle saw 2X TPM and 1.3X NOPM.
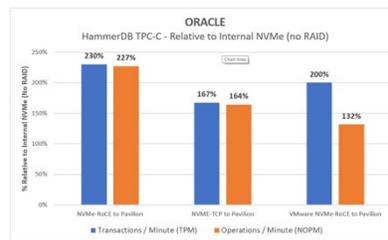
Scale Oracle's performance from high to ultra-high, and capacity from TBs to multi-PBs, all linearly. Pavilion eliminates the need for a separate storage appliance for block, file, and object applications. It supports all three simultaneously over Ethernet and InfiniBand with the highest performance per data center rack unit to every application. Its block, file, and S3 hybrid cloud support enable Oracle users to combine and analyze relational, unstructured data and S3 object data for AI/ML and other data analysis accelerating time to results, instead of running them in the Oracle cloud.

Using Oracle servers that don't have DAS storage can double the density of a rack. In addition, the Pavilion platform reduces storage management costs by 50% over DAS and saves money by reducing server hardware and paring data center space reducing the cost of deploying Oracle clusters significantly. No custom software needs to be installed on the Oracle servers, enabling them to take full advantage of host processing resources and reduce risk.

Protect the Oracle data stored on the Pavilion platform's SSDs with RAID-6, and the patented SWARM capability. SWARM uses the multiple controllers of the Pavilion HFA to rebuild a failed SSD at the rate that is under 5 minutes per TB. The Pavilion platform also protects Oracle application data with self-healing bit-rot support, ensuring that every Oracle application gets uncorrupted data.

Security is a must for Oracle applications. Pavilion uses a FIPS 140-2 certified always-on encryption that does not impact performance. Use consistent snapshots, encrypt those snapshots, and use standard backup and restore utilities with confidence to keep data safe and secure. Instant snapshots and clones with a consistency group feature allow an entire clustered database to be backed up or copied for test/dev purposes and on the fly without any performance impact to running Oracle applications.

Boost Oracle performance with end-to-end data integrity, linear scalability, a robust and modular chassis, and redundancy throughout the storage array to protect your environment as infrastructures grow. All features come in-the-box, including thin provisioning, snapshots, clones, data at rest encryption and more. Support won't delay the deployment of Oracle applications. Pavilion provides 24/7 proactive cloud-based support and can act as an extension of your IT organization for Oracle deployments.

Learn More

Pavilion shatters customer expectations and resulting organizational outcomes by revolutionizing data processing for modern AI/ML, HPC, Analytics, Enterprise Edge, and other data-driven applications. The Pavilion HyperParallel Flash Array, powered by Pavilion HyperOS™, delivers unmatched performance and density, ultra-low latency, unlimited scale, and flexibility, providing customers unmatched choice and control. Learn why Fortune 1000 companies as well as federal, state, and local government agencies choose Pavilion. To learn more or schedule a demo, visit www.pavilion.io. Follow the company on LinkedIn.