PostgreSQL

Benefits

- Cut server & storage CapEx
- 50% reduction of networking cost due to future-proof design
  - Boost PostgreSQL performance and get better insights
  - 1.5X more transactions/second at 67% of the latency
- Save 50% of rack space over nearest competitor or by using diskless servers
- Eliminates BC/DR impact to PostgreSQL operations
- Data integrity protects PostgreSQL applications from data corruption

Features

- Dense design with High-Performance and Low-Latency
- Multi-Platform
  - VMware certified NVMe/RDMA (RoCE v2), NVMe/TCP drivers, iSCSI, and NFS drivers for PostgreSQL on VMware 7
  - NVMe/RoCE and NVMe/TCP drivers for PostgreSQL on Linux
  - iSCSI, NFS, S3, SMB, and Kerberos CSI protocols for other Linux, Windows, and VMware applications
- Unified Block, NFS, and S3 drivers
- NFS and S3 Global Namespace
- Intuitive management via Web GUI, vCenter, Kubernetes, REST API, OpenStack, DTMF/Redfish, and Swordfish
- Cloud-based call-home support

NVMe-oF Storage for PostgreSQL

Boost PostgreSQL Performance and Derive Better Insights

Your environment has a variety of mission-critical applications, including AI/ML, HPC, Analytics, Enterprise Edge, and other and other advanced applications that run on PostgreSQL. But their success relies on a modern, high-performance storage environment that is simple, scalable, adaptable, and resilient. This is where the Pavilion HyperParallel Flash Array (HFA) comes in.

Many organizations use a Direct Attached Storage (DAS) configuration for PostgreSQL that is easy to deploy but is complex, slow, and hard to scale. Analyzing data across hot, warm, and slow tiers using a DAS-based design will be slow and is lacking in enterprise features and centralized storage management. Costs quickly escalate when processing must be used for storage management features and IT must manage each PostgreSQL client or server.

Using a distributed DAS model was ideal for slow storage and network configuration, but today it just leads to slow operations. A server is a single point of failure, requiring IT to reserve at least half the storage space for copies of data from other nodes, this increases storage cost and network traffic and leads to expensive data/IO rebalancing. If a server runs out of space, PostgreSQL will fail, requiring IT to add additional servers & storage.

Rely on a High-Performance NVMe-oF Design and Focus on Outcomes

The Pavilion HFA is a high-performance, low latency All-Flash Array (AFA) that uses NVMe-over-Fabrics (NVMe-oF). Pavilion leads the industry in its support of NVMe-oF and is built for NVMe from the ground up, not shoe horned-in like many other vendors. Pavilion boosts PostgreSQL transactions on Linux and VMware, enabling customers to derive actionable insights in a short amount of time from big and fast data workloads.

The patented architecture of the Pavilion HFA provides its high-performance and ultra-low latency in a compact form factor that is more than twice as small as the nearest competitor.
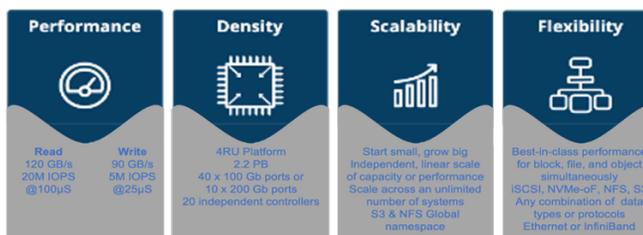
A multi-controller design enables PostgreSQL customers to architect more complex databases without worrying about hot spots, support more concurrent operations, achieve continuous operations, and shatter backup windows.

PostgreSQL Delivers More with Pavilion

The Pavilion HFA provides PostgreSQL with performance that is better than a locally attached NVMe SSDs. It avoids customers having to create storage islands with its unified block, file, and object support.

A PostgreSQL (v14) server and PGBench (v14.1) running on Linux Centos 8.5.2111 were tested using NVMe/TCP and NVMe/RoCE with INTERNAL NVMe drives and compared to NVMe-oF with the Pavilion HFA. This test was repeated under VMware using the VMware NVMe/RDMA (RoCE v2) driver. In all cases, the configuration that used NVMe-oF with the Pavilion HFA was superior to same configuration using INTERNAL NVMe SSDs.

The Pavilion HFA's NVMe/RoCE support was tested with the server running Linux, it delivered better results than the same server using INTERNAL NVMe drives. Testing showed that the Pavilion HFA had 48% more transactions per second and 33% better latency than the same server with INTERNAL NVMe drives

The Pavilion HFA's NVMe/TCP support was tested with the server running Linux, it delivered better results than the same server using INTERNAL NVMe drives. Testing showed that the Pavilion HFA had 14% more transactions per second and 12% better latency than the same server with INTERNAL NVMe drives.

The Pavilion HFA's NVMe/RoCE support was tested with the server running VMware, it delivered better results than the same server using INTERNAL NVMe drives. Testing showed that the Pavilion HFA had 13% more transactions per second and 11% better latency the same server with INTERNAL NVMe drives.

PostgreSQL on Pavilion
Compared to DAS-NVMe

■ Transactions Per Second   ■ Average Latency (µs)
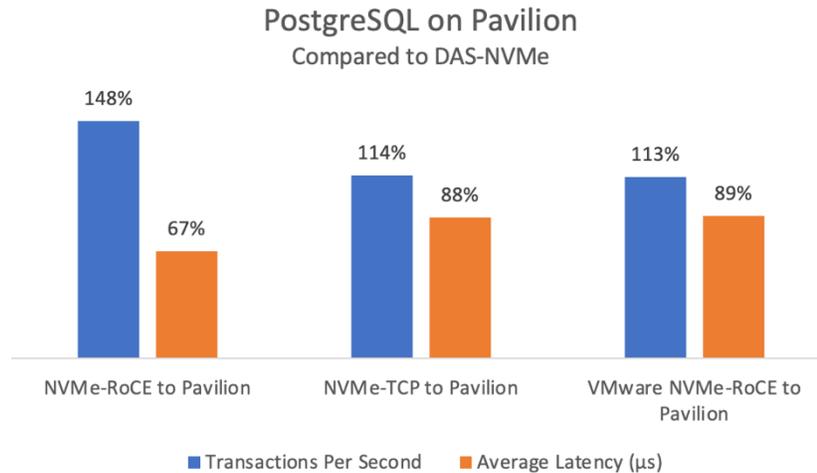
For full results contact Pavilion at info@pavilion.io.

Using PostgreSQL with servers without DAS storage can double the density of a rack. In addition, the Pavilion HFA reduces storage management costs by 50% over DAS and saves money by reducing server hardware and data center space. This reduces the cost of deploying PostgreSQL clusters significantly. No custom software needs to be installed on the nodes, enabling them to take full advantage of host processing resources and reduce risk. Protect PostgreSQL SSDs with RAID-6 and the Pavilion Swarm capability, which will rebuild a failed SSD at the rate of 5 minutes per TB. It also provides PostgreSQL with self-healing bit-rot support, to assure that the distributed document store stays uncorrupted.

Security is a must for PostgreSQL. Pavilion uses FIPS-compliant data at rest encryption and ensures its always-on encryption does not impact performance. Use consistent snapshots, encrypt those snapshots, and use standard backup and restore utilities to ensure that PostgreSQL data stays safe and secure. Instant snapshots and clones with a consistency group feature allow an entire PostgreSQL node cluster to be backed up or copied for test/dev purposes and on the fly without any performance impact to running PostgreSQL.

Get end-to-end data integrity, a robust and modular chassis, and redundancy throughout the storage array to protect your PostgreSQL document store as its infrastructure grows. All features come in the box, including thin provisioning, snapshots, clones, data at rest encryption, and more. Support concerns won't delay the deployment of PostgreSQL. Pavilion provides 24/7 proactive support, a cloud-based call home service, and can act as an extension of your IT organization for PostgreSQL.

Zero-footprint snapshot capability provides an instant replica of a PostgreSQL cluster. Developers, testers, and other organizations that need access to real-time data can utilize this replica. The snapshot also removes the need to quiesce PostgreSQL for operations like backup, replication, business continuance, and DR, accelerating time-to-results.

Pavilion eliminates the need for a separate storage appliance for block, file, and object applications. It supports all three simultaneously and provides the highest performance per data center rack unit to every application. It enables the deployment of scalable clusters of PostgreSQL, SQL Server, and HDFS containers running on Kubernetes. Now users can combine and analyze relational, unstructured data, and S3 object data for searches, AI/ML, and other data analysis.

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 Data Platform™, 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 500 companies and federal government agencies choose Pavilion. To schedule a demo, visit www.pavilion.io. Follow the company on LinkedIn.