

NVMe-oF Storage for MongoDB

No-compromise disaggregated storage with NVMe-oF

Big-data analytics, AI/ML, mobile, and cloud-delivered applications using MongoDB are driving a new paradigm in IT infrastructure design. Resources need to be freed. They need to be available and deployed so that the ever-changing requirements can be satisfied on a minute-by-minute basis. This means that compute, network, and storage resources all need to scale independently to meet an ever-increasing and diverse set of application requirements.

In the last decade, server performance has increased 10X due to advances in CPU and GPU design, but flash storage has lagged behind mainly due to using interfaces designed for hard disk drives. Enter the NVMe interface that is designed for flash and unlocks its performance. Many boosted MongoDB's performance by adding NVMe SSDs to their server nodes. However, DAS SSDs have multiple issues, including over-provisioning, limited HA, and the lack of enterprise functionality. So, many business disaggregated their storage and used all-flash arrays (AFAs) with NVMe SSDs. However, adding NVMe drives to the dual controller platform in many AFAs does not unlock the full performance of NVMe SSDs since these AFAs cannot provide the parallelism these SSDs require. This raises challenges in scaling MongoDB, requiring businesses to use multiple AFAs when they disaggregate. Pavilion has a better way.

The Pavilion Hyperparallel Flash Array

Pavilion delivers rich enterprise data services for all of your applications. Modern applications deserve a modern storage OS. The Pavilion^{OS} is designed for NVMe. With no legacy to protect, the Pavilion Hyperparallel Flash Array (HFA) is free from years of code bloat, heavy reliance on DRAM, and backward compatibility for SATA and SAS SSDs.

The Pavilion HFA does not compromise on NVMe performance. It provides 90 GB/s throughput, 40µs of latency, 20M IOPS, and 1.1 petabytes of density in a compact 4U form factor. It provides MongoDB applications with the performance of locally attached NVMe SSDs. The Pavilion HFA uses 72 NVMe SSDs and supports multiple block and file protocols with NVMe-oF/RDMA, NVMe-oF/TCP, iSCSI, and NFS.

The Pavilion HFA requires no proprietary software to be installed on a server farm and uses standard NVMe, NVMe-oF, Ethernet, and InfiniBand drivers, freeing up host resources for processing and reducing deployment risk.



Benefits

- Doubles rack density
- Reduces storage deployed by 75% and storage TCO by half
- Petabyte scalability, high-performance, low-latency, and linear scaling maximizes data center efficiency
- Protects MongoDB and the business
- Concurrent block & file protocols gives deployment flexibility
- Simplifies MongoDB's Infrastructure by disaggregating storage into a centralized, rack-scale appliance
- Enterprise design and data integrity validation ensures MongoDB can reliably access data
- Rack scale management via Web GUI, vCenter, Kubernetes, RESTful API, OpenStack, DTMF/Redfish, and Swordfish

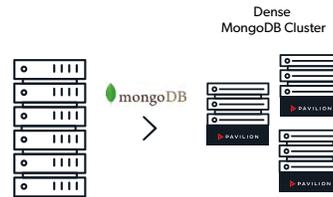
Benefits of Disaggregation

The Pavilion HFA delivers high performance and low latency to MongoDB.

Fast & Dense



Move to a disaggregated infrastructure and achieve optimized levels of processing, storage and network bandwidth that can be scaled independently, and speed the transition to Infrastructure 3.0. Using servers that don't have DAS storage can double the density of a rack. No custom software needs to be installed on the nodes, enabling them to take full advantage of host processing resources and reduce risk.



Safe & Secure



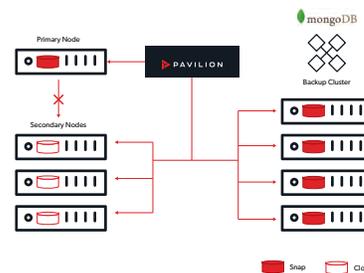
Protect the SSDs with RAID-6 erasure coding. When an SSD fails the Pavilion HFA rebuilds it 12X quicker than DAS or an AFA. It also provides MongoDB applications with self-healing bit-rot support, to assure every application gets uncorrupted data.

Security is a must for every organization. Pavilion uses a 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 with confidence that application data is safe and secure.

Enterprise Strength & Enterprise Support



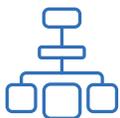
Pavilion's instant, zero-space snapshots and clones with its consistency group feature can be used to create copies of MongoDB applications, enabling DevOps to accelerate go-to-market activities by rapidly deploying copies of applications to Dev, QA, and other stakeholders.



Get end-to-end data integrity, a robust and modular chassis, and redundancy throughout the storage array to protect your containers as infrastructures grow. All features come in-the-box, including thin provisioning, snapshots, clones, data at rest encryption and more.

Don't let support concerns prevent the deployment of MongoDB applications. Pavilion provides 24/7 proactive support and can act as an extension of your IT organization for all applications.

Economical & Flexible Management



NVMe SSDs are the most expensive components of a MongoDB application, why not reduce them? Scale down flash storage deployed by 2-3X, and save 50% over DAS in terms of \$/GB/sec.

Pavilion's OpenChoice Storage™ does not lock you in to a vendor. Use NVMe SSDs that have the performance, endurance, capacity, and technology you need for all your containers, leveraging existing suppliers or purchasing new NVMe SSDs from Pavilion. With the Pavilion HFA you won't waste SSD space. It only allocates physical space as the application requires/consumes it. Save TCO by having no wasted capacity and no time spent messing with volume managers or file systems.

Reduce IT expenditure in several areas including hardware acquisition, rack-space, power and cooling, and storage management costs by moving to Pavilion.