

NVMe-oF Storage for MySQL

No-compromise disaggregated storage for MySQL

MySQL is a powerful Open-Source database being deployed in some of the largest mission-critical environments, for things like content management, OLTP transactions, eCommerce, and more. It's rich set of features allow it to be deployed for high-traffic websites as well as petabyte sized data warehouses in either scale up or scale-out architectures. Most MySQL applications need high-performance and low-latency storage backends, strong data protection, and management ease.

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 customers added NVMe SSDs to their MySQL servers. However, using DAS SSDs with MySQL exposes multiple issues, including over-provisioning, limited HA, and the lack of enterprise functionality. So, many business disaggregated their MySQL storage by using all-flash arrays (AFAs) that have NVMe SSDs.

As part of this disaggregation, many customers consolidated multiple MySQL databases, this forced the underlying storage systems to provide high IOPS and very low latencies. Adding NVMe drives to the dual controller platform in many AFAs did not unlock the full performance of NVMe SSDs since these AFAs cannot provide the parallelism these SSDs require. This raises challenges in scaling and consolidating MySQL, requiring businesses to use multiple AFAs when they disaggregated MySQL. Pavilion has a better way.

The Pavilion Hyperparallel Flash Array

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

The Pavilion HFA is ideal for MySQL as it does not compromise on 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 MySQL applications with the performance of locally attached NVMe SSDs with its 72 NVMe SSDs and multiple concurrent 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

- Increase rack density 2X
- Reduces MySQL storage by 75% and TCO by half
- Petabyte scalability, high-performance, low-latency, and linear scaling maximizes data center efficiency
- Protects MySQL and the business
- Reduce the cost of deploying large cloud-scale MySQL deployments
- Deliver over 10X better application performance in high-scale cloud, web, and SaaS environments
- Enterprise design and data integrity validation ensures MySQL can reliably access data
- Rack scale management via Web GUI, vCenter, Kubernetes, RESTful API, OpenStack, DTMF/Redfish, and Swordfish

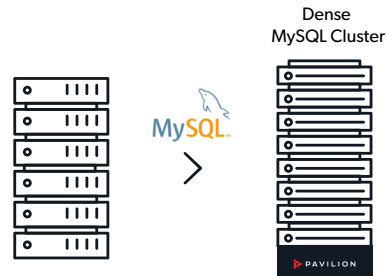
Benefits of Disaggregation

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

Fast & Dense



Disaggregate MySQL infrastructure and achieve optimized levels of processing, storage and network bandwidth that can be scaled independently. 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. The Pavilion HFA provides 90 GB/s throughput with 20M IOPS to MySQL environments, which is over 10X more than using two DAS-based NVMe SSDs, lowering the cost of deploying MySQL clusters significantly.

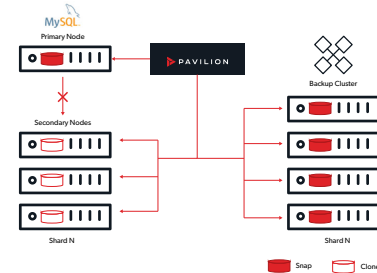


Safe & Secure



Protect MySQL SSDs with RAID-6 erasure coding. When an SSD fails the Pavilion HFA rebuilds it 10X quicker than if you used DAS or an AFA. It also provides MySQL applications with self-healing bit-rot support, to assure every application gets uncorrupted data.

Security is a must for MySQL applications. 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 MySQL data is safe and secure.



Enterprise Strength & Enterprise Support



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.

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.

Support concerns won't delay the deployment of MySQL applications. Pavilion provides 24/7 proactive support and can act as an extension of your IT organization for MySQL deployments.

Economical & Flexible Management



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

Pavilion 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.