

## Benefits

### No-Compromise NVMe storage

- World's First Hyperparallel Flash Array
- High-Performance, Low-Latency, Linear Scaling, and Compact Chassis Maximizes Data Center Efficiency
- Simultaneous NVMe-oF/TCP, NVMe-oF/Ethernet, NVMe-oF/InfiniBand

### Enterprise Features

- Thin Provisioning saves up to 2X on SSDs
- Unified Block & File Protocols
- Distributed DP Raid with 12X Faster Rebuild Than DAS and Legacy AFAs
- Instant and space-saving snapshots and clones
- 2-3X Lower Storage TCO
- Continuous Operations with Multi-Pathing
- Data at Rest Encryption
- Non-Disruptive Software Upgrades

### Economical

- OpenChoice Storage™ avoids vendor lock-in and lowers SSD TCO
- Linear Scaling of Storage & Compute
- 24/7 Proactive Support
- Support of iSCSI and NFS for Legacy Applications

## Pavilion<sup>OS</sup>

Modern applications deserve a modern storage OS. Pavilion<sup>OS</sup> delivers rich enterprise data services for all of your applications. Designed for NVMe, with no legacy to protect, Pavilion<sup>OS</sup> is free from years of code bloat, heavy reliance on DRAM, and backward compatibility for SATA and SAS SSDs. It delivers ultra-high performance and ultra-low latency that accelerates legacy and modern rack-scale applications. Don't be held back by legacy AFA designs that are 25X more expensive in terms of \$/IOPS. The Pavilion Hyperparallel Flash Array (HFA) is designed not just for your exotic applications but is the one platform for all your applications.

All storage services, APIs, and advanced data services are built-in and included with every array. Host resources are not required to scale performance, freeing up those resources for scaling applications, not storage.

The Pavilion HFA was designed to address the requirements of a modern data center. Today's data centers are pulled in multiple directions; technology is advancing, needs are increasing, complexity is increasing, costs have to stay flat, data is increasing, and more.

### Developer View



### Infrastructure View



I need something that makes my application meet its SLA

I cannot keep buying more servers

Storage is turning out to be a bottleneck

IT compliance with modern applications not met

Business wants actionable reports now!

Pavilion<sup>OS</sup> is 100% standards-compliant. It uses standard Ethernet/InfiniBand networking interfaces, standard NVMe SSDs, standard host software stacks, and more. Pavilion does not require any custom software to be installed on application hosts or network switches. It uses standard 40Gb or 100Gb Ethernet/InfiniBand adapters for NVMe/Ethernet (RoCE v2), NVMe/TCP, NVMe/InfiniBand (RDMA), and any v1.x compliant NVMe-Over-Fabrics driver. All of these protocols and fabrics can be operational in a single system with backward compatibility to iSCSI.

### Controlling data growth & keeping cost in check



#### Thin Provisioning

- Volumes are logical NVMe disks and used as a regular block device. The volume is thin provisioned from the media group. The user receives the provisioned size of the volume, yet space is only allocated as-needed to maximize utilization. Volumes can range from under one TB to 100s of TBs and can be re-assigned or shared between systems as needed.

#### OpenChoice Storage™

- Pavilion's OpenChoice Storage™ does not lock you into a vendor. Use NVMe SSDs that have the performance, endurance, capacity, and technology you need for all your applications, 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 with no wasted capacity and no time spent messing with volume managers or file systems.

### Block & File



#### Unified

- Applications need access to lots of data, but much of it resides in silos. Unify the silos, driving collaboration across block and file data. Simultaneously use NVMe/RDMA, NVMe/TCP, iSCSI, and NFS for all your application needs.

### Ensuring Data is Safe & Secure



#### Distributed Dual Parity RAID

- Fully populated, the array organizes NVMe SSDs into 4 groups of 18 drives. Pavilion implements a distributed RAID 6 within a group, resulting in 16+2 RAID 6 protection. The overhead for RAID 6 is less than 12%. Optionally a hot spare can be defined, resulting in 15+2+1 RAID 6 protection.

#### Automatic "SWARM" Rebuild

- In the event of a drive failure, multiple controllers swarm the replacement drive in parallel to ensure fast rebuild. A 1TB drive is recovered in less than 5 minutes. With the Pavilion HFA, an application's SSDs are fully rebuilt with RAID 6 protection 12X faster than using DAS or an all-flash array.

#### Snapshot/Clones

- Multiple logical crash-consistent copies can be made of any volume and served out to different applications, such as a backup process, individually. These copies are consistent, space-efficient, instant, and writeable. Created instantly without physical data copy activities occurring; blocks are then written as the copy or original is modified over time.

#### Continuous Operations with Multi-Pathing

- Achieving the necessary level of availability and reliability for massively parallel modern applications is costly. Underutilized and stranded capacity trapped in servers and the operational overhead of managing these isolated servers is an ongoing challenge for IT. There is no single point of failure and, I/O can be performed by multiple storage controllers, increasing data availability.

#### Data at Rest Encryption

- Security is a must, so Pavilion implements FIPS-compliant data at rest encryption and ensures the always-on encryption does not impact performance.

#### Non-Disruptive Software Upgrades

- Meeting compliance requirements is a fundamental part of the system design. All Pavilion<sup>OS</sup> updates can be applied without disruption to ongoing operations.

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## Economical & Flexible



### Linear Scalability

- The Pavilion HFA supports the demands of multiple application with its cloud-like scalability. When an application's capacity needs to increase, DevOps can add an NVMe SSD without impacting performance. Conversely, when an application needs more I/O performance, additional storage controllers can be added without impacting capacity.

### Multi-Fabric

- Pavilion HFA supports up to 40 NVMe-oF Physical Fabric Ports, eliminating unnecessary protocol translations while enabling NVMe semantics for low-latency and high IOPS across a range of topologies including NVMe/Ethernet, NVMe/TCP, NFS, iSCSI, and NVMe/InfiniBand.

### Integration

- The Pavilion HFA lets you manage the array as you prefer. Whether you like to use a full-featured Web GUI and CLI that delivers deep insight into performance metrics at the volume/application, controller, port, or system level. You can also utilize its REST-based API to integrate with DTMF/Redfish and Swordfish or use the Pavilion HFA's OpenStack and vCenter plug-in, or integrate with Kubernetes with its FlexVolume plug-in and CSI support for persistent volumes (PVs).

### Proactive Support

- The Pavilion HFA reports issues to Pavilion's cloud-based support portal for analysis by Pavilion. The support portal enables Pavilion to proactively respond to an issue, performing problem-solving operations remotely.
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