

HPE 3PAR StoreServ 8000 Storage

Effortless, Tier-1 flash with midrange affordability

Key features and benefits

Lower your total cost of storage with flash

- Lower the cost of all-flash to as low as \$1.20/GB with robust support including a 5-year warranty and 7-years of wear out¹
- Get the savings you want with the performance you need with 3PAR Adaptive Data Reduction, inclusive of deduplication, compression, and Data Packing
- Transition to All-flash data center with simple HPE 3PAR All-Inclusive software licensing
- Get industry-leading density of up to 11 PB per floor tile

Deliver performance without compromise

- Remove bottlenecks with a flash-optimized, scale-out architecture delivering over 1 million IOPS and over 20 GB/s
- Protect service levels with QoS optimization and consistent, sub-millisecond latency
- Support mixed workloads and accelerate performance with the HPE 3PAR Gen5 ASIC

Avoid downtime and consolidate with confidence

- Maintain software defined extreme high availability with Peer Persistence support for three data centers and disaster recovery over distance
- Replicate data between StoreVirtual VSA and 3PAR directly for remote offices, low cost data protection
- Achieve near-synchronous RPOs with flexible, transparent, model-agnostic remote replication
- Simplify backup and restores with application-aware, flash-integrated data protection

Looking to consolidate onto an enterprise-class flash array without compromising performance, scalability, data services, or resiliency? With unmatched versatility, performance, and density, HPE 3PAR StoreServ 8000 Storage has you covered.

The industry experts have validated our claim. HPE 3PAR StoreServ All-Flash solution is the only one of its kind to be featured as a leader by Gartner and IDC with leading SPC-1 and SPC-2 results. For example, the HPE 3PAR StoreServ 8450 SPC-1 benchmark that delivers \$0.23/SPC-1 IOPS² gives you industry leading affordability with all flash performance.

HPE 3PAR StoreServ 8000 Storage delivers the performance advantages of a purpose-built, flash-optimized architecture without compromising resiliency, data services, or data mobility. A flash-optimized architecture reduces the performance bottlenecks that can choke hybrid and general-purpose disk arrays. However, unlike other purpose-built flash arrays, HPE 3PAR StoreServ 8000 does not require you to introduce an entirely new architecture into your environment to achieve flash-optimized performance.

As a result, you don't have to sacrifice rich, Tier-1 data services, quad-node resiliency, or flexibility to get midrange affordability. A choice of all-flash, converged flash, and tiered-flash models gives you a range of options that support true convergence of block and file protocols, all-flash array performance and the use of spinning media to further optimize costs. All-flash performance at the lowest possible cost starts with 3PAR Adaptive Data Reduction technologies that includes Zero Detect, deduplication, compression, and Data Packing. Support for iSCSI connectivity gives you the flexibility to deploy flash using Ethernet while preserving sub-millisecond latencies.

You'll be up and running in just minutes, meeting mixed workload demands with improved service levels and virtually unlimited scalability options. You'll spend less time managing your storage with converged block, file, and object access from a single interface. You'll maintain high availability through a complete set of persistent technologies and have the option of simple and efficient data protection with flat backup to HPE StoreOnce Backup appliances. You'll rid yourself of tradeoffs that have forced you to sacrifice critical capabilities like all-flash performance for scalability and Tier-1 data services.

Lower your total cost of storage with flash

With rich capabilities lowest possible cost for all-flash performance and non-disruptive scalability to four nodes, HPE 3PAR StoreServ 8000 Storage eliminates tradeoffs. You no longer need to choose between affordability and Tier-1 resiliency or flash-optimized performance and Tier-1 data services. That's because HPE 3PAR StoreServ 8000 Storage shares the same flash-optimized architecture and software stack with the entire family of HPE 3PAR StoreServ arrays—so you'll not only get an industry-leading storage platform, but a storage platform that you can grow into, not out of.

¹ All SSDs on 3PAR 8000/20000 purchased after June 1, 2015 with life left below 5% as determined by HPE and with drive age less than seven years from warranty start date and no interruption in HPE support coverage. Wear out in years six and seven applies to media and electronic failure replacements for all SSDs.

² [SPC-1 Executive Summary](#)

Respond effortlessly to unpredictable and changing demands

- Grow with freedom in any direction, from as little as 3 TB to up to 11 PB usable in a single system³
- Modernize your EMC, HDS, and IBM storage infrastructure with painless, no-cost data migration
- Address storage at the data center level with seamless data movement between arrays
- Unify management with a single experience from device to data services to data center

Get industry-leading density

HPE compaction technologies not only drive flash affordability, but also improve scalability, specifically with relation to density.

Consolidate more data in a smaller footprint:

- Start with 550 TB usable capacity in a single 2U enclosure
- Scale to up to 11 PB usable capacity in a single HPE 3PAR StoreServ 8000 system

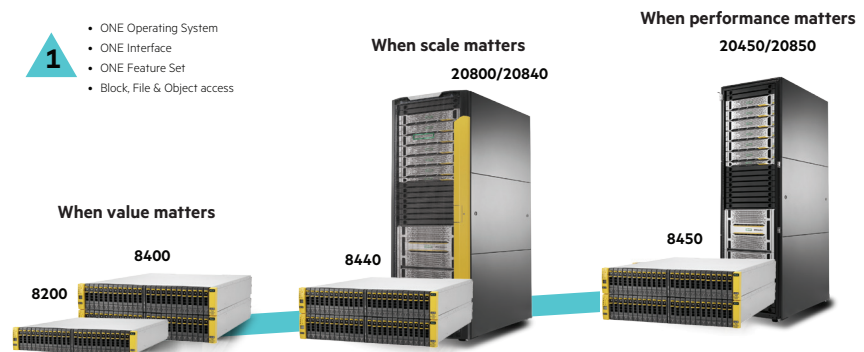


Figure 1. HPE 3PAR StoreServ Storage models

Unlike bolt-on thin storage on legacy arrays, HPE 3PAR StoreServ 8000 Storage features hardware-enabled **Adaptive Data Reduction software**—including inline Deduplication for any SSD tier—that allow the system to run in a state of consistent high-capacity utilization without performance tradeoffs; compression with inline Express Scan that removes redundant data and prevents wasted CPU cycles; Data Packing condenses data to a single page increasing storage efficiency and bandwidth. You save on the cost of a storage technology refresh and increase storage ROI by keeping incremental purchases, administration, and operating costs low over time. In fact, the HPE 3PAR Get Thinner Guarantee Program promises new HPE 3PAR StoreServ customers as much as 75% reduction in capacity requirements by replacing legacy storage with HPE 3PAR StoreServ—guaranteed.⁴

True convergence of block, file, and object access

With HPE 3PAR File Persona, you can unlock the native file and object graphical access capabilities within any of your HPE 3PAR StoreServ Storage array. This approach offers a unique solution that incorporates multi-protocol support into the system architecture to deliver a tightly integrated, converged solution for provisioning both block volumes and file shares from a single storage system. Unlike traditional solutions, this converged solution extends the architectural benefits that the HPE 3PAR StoreServ Storage system already delivers for block workloads to file shares and object access in a way that is simple to deploy and administer.

HPE 3PAR File Persona enables a rich set of file protocols, file data services, and an Object Access API (REST) and gives you the ability to provision file shares in addition to block volumes from a single graphical user or programmatic management interface. This solution extends the spectrum of storage workloads natively addressed by the system's default Block Persona. The Block Persona is ideal for your virtualization, database, and application workloads with the File Persona enabling home directory and user shares, enhanced content management and collaboration, and data preservation and governance. By expanding the use of your system, you can realize up to 71% data center space savings and significant power savings with a single converged solution that gives you agile provisioning of block, file, and object access.⁵

Flexible management that's so simple, it's autonomic

The HPE 3PAR StoreServ Management Console (SSMC) enables effortless management of your HPE 3PAR StoreServ Storage (figure 2). It is a sleek, web-based console that gives you comprehensive, consolidated management of your entire converged storage deployment with HPE OneView integration. Support for a variety of application interfaces and for OpenStack[®] gives you unprecedented flexibility and increases productivity by giving your application and VMware[®] administrators greater visibility and control. Flexibly manage block, file, and object access from a single interface serving diverse workloads. Get all the information you need at a glance with customizable reporting capabilities. Remove the need for add-on software tools as well as diagnosis and troubleshooting that typically require professional services.

Assess what's happening across the entire data center in seconds via a simple dashboard and you are just one click away from collecting configuration and health information on any resource. Historical performance and capacity reports are also accessible with one click via HPE 3PAR System Reporter to help you plan future configuration changes to improve infrastructure investments.

³ Minimum configuration starts with six HDDs or SSDs. Maximum configuration includes 5.6 TB usable SSD capacity (with 4:1 compaction) and 1.7 TB usable HDD capacity (with 2:1 compaction)

⁴ Subject to qualification and compliance with the HPE 3PAR Get Thinner Guarantee Program Terms and Conditions, which will be provided by your HPE Sales or Channel Partner representative

⁵ HPE internal analysis compared to EMC VNX, September 2014

The autonomic experience

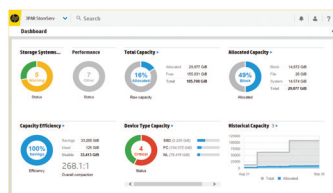


Figure 2. The HPE 3PAR StoreServ Manage Console (SSMC) dashboard view provides health, performance, and capacity at a glance for up to 32 HPE 3PAR StoreServ arrays of any model

Need to assure QoS with sub-millisecond latency?

HPE 3PAR Priority Optimization software enables you to manage service levels for applications and workloads as business requirements dictate to assure QoS. This means you can provision storage performance as easily and efficiently as provisioning storage capacity. Reduce contention and certify that performance is delivered where you need it most in multi-tenant environments.

A highly automated approach allows you to quickly and easily assign a minimum goal for IOPS, bandwidth, and latency to protect mission-critical applications in enterprise environments.

Alternatively, assign performance thresholds on workloads with lower service level requirements. This capability allows you to consolidate more applications on less infrastructure while delivering predictable performance to meet even the most demanding service level requirements.

Unlike application-centric approaches to storage, one-click autonomic rebalancing on HPE 3PAR StoreServ Storage enables you to help improve QoS levels without service disruption, pre-planning, or the need to purchase separate arrays to support different service levels.

HPE Smart SAN for HPE 3PAR StoreServ

HPE Smart SAN brings together a set of creative features based on Fibre Channel Industry Association (FCIA) FC in-band control and communication to SAN management. Smart SAN for 3PAR helps reduce end-to-end SAN complexity for all-flash deployments with automation and HPE 3PAR target driven host orchestration. To address the complexity and tedious nature of traditional SAN switch zoning, HPE used an industry standard FCIA T-11 definition, added a set of creative software features on HPE 3PAR StoreServ, and collaborated with HPE StoreFabric FC vendors to implement Smart SAN for 3PAR support in their solutions. Smart SAN for 3PAR support includes StoreFabric 16 Gb and 32 Gb FC server adapter (hosts) and StoreFabric B-series (16 Gb and 32 Gb) and converged HPE FlexFabric 5900 Switch Series switch vendors to implement end-to-end software based automated Target and 3PAR Federated Driven Peer Zoning (TDPZ) to address traditional SAN complexity and the tedious nature of switch zoning. The HPE approach called HPE Smart SAN for 3PAR StoreServ is a holistic way to simplify an end-to-end SAN complexity orchestrated from 3PAR across hosts and switches resulting in minutes to provision a host rather than hours or days with less human error—more SAN simplicity and greater SAN resiliency. As an example, in a mid-sized SAN consisting of nine fabric switches, traditional FC switch zone configuration for 128 host initiators, 1024 zones and eight HPE 3PAR target ports took hours when using HPE Smart SAN for 3PAR to zone the same fabric it resulted in a saving of over 80% configuration time with Target Driven Peer Zoning (TDPZ).

HPE Smart SAN also supports FCIA standards-based device registrations and diagnostic data collection for better configuration, visibility, and diagnostic purposes. This drastically improves the customer experience with significant reduction in overall SAN configuration time as well as making the whole process less error prone and SAN healthier.

Storage analytics in the cloud with HPE StoreFront Remote

The HPE StoreFront Remote (SFRM) SaaS Portal provides proactive tools and integrated data collection from the HPE 3PAR StoreServ Storage arrays that call home to deliver unique insights and analytics all in one dashboard. Identify capacity and performance issues early through intuitive capacity and get recommendations to increase the wellness score of your HPE 3PAR StoreServ arrays.

Get the most out of your storage investment and continuously optimize your infrastructure based on remedial actions suggested by SFRM. Go to [HPE StoreFront Remote](#) for information on how to register your arrays.

Deliver performance without compromise

HPE 3PAR StoreServ 8000 Storage removes the bottlenecks that prevent legacy storage from taking full advantage of flash-based media. A flash-optimized architecture enables optimal performance of flash-based SSDs that may also be used as a true extension of DRAM cache. Block-level storage tiering and mixed workload optimization enable high levels of performance for both spinning and flash media.

This flash-optimized architecture allows the HPE 3PAR StoreServ 8000 Storage family to deliver multi-petabyte scalability with accelerated performance of over 1 million IOPS, over 20 GB/s, and sub-millisecond latency. This flash-optimized architecture relies on several unique HPE 3PAR StoreServ innovations:

- **Multi-controller, scale-out architecture:** Up to four controllers form a Mesh-Active cluster based on a unique system of controller node interconnects. Unlike traditional “Active/Active” architectures, this clustered design delivers robust, load-balanced performance and greater headroom for cost-effective scalability that overcomes the tradeoffs typically associated with modular and monolithic storage.
- **HPE 3PAR Gen5 ASIC:** Supports mixed workloads and enables thin technologies to take place in silicon rather than consuming processing cycles, including inline deduplication that alleviates performance issues that bog down other storage architectures. The Gen5 ASIC supports mixed workloads with extremely high performance levels so that transaction-intensive and throughput-intensive workloads run on the same storage resources without contention.

Boost flash performance with Gen6 32 Gbps Fibre Channel

Increase SAN performance for all-flash with Gen6 32Gb FC. For a MS SQL 2016 Warehousing environment, test results show a 37% increase in read throughput, 54% of large block I/Os completed in less than 2ms, and 49% higher SQL transactions per second.

Need proof?

See the results from the [Demartek Evaluation Report: Improving Business Outcomes with HPE DL380 Gen9 Server, 3PAR StoreServ 8450 All-Flash Storage, StoreFabric SN6600B Switch and SN1600E HBA Gen6 32Gb FC](#)

HPE StoreOnce Recovery Manager Central
Express Protect



Figure 3. Simplify backup and restores with application-aware, storage-integrated data protection

3PAR Flash-Integrated Data Protection: Reducing Risk in the All-Flash Data Centre

If you are looking for virtually instant application-consistent availability and protection for your VMware, Microsoft® SQL, Oracle, and SAP HANA® environments, look no further than rapid and granular backup and recovery with HPE Recovery Manager Central (RMC) software and HPE StoreOnce.

HPE Recovery Manager Central software integrates HPE 3PAR All-Flash arrays with HPE StoreOnce Systems to provide a converged availability and protection service optimized for flash environments. It augments traditional backup approaches, combining the performance of snapshots with the protection of backups. As a result RMC offers 23x faster backup with no backup impact on the application server, enables self-service application managed protection for VMware, Microsoft SQL, Oracle, and SAP HANA environments, lowers cost and complexity by eliminating need for a backup application, and reduces risk by protecting applications running on 3PAR against storage platform outage, file loss or application corruption beyond the oldest snapshot.

⁶ Based on HPE internal testing with HPE 3PAR Adaptive Flash Cache enabled

⁷ Based on a random, 100% write workload with an 8 KB block size

⁸ Available on HPE 3PAR StoreServ 8000 and 20000 systems purchased after June 1, 2015

- **Adaptive read and write technology:** Matches host I/O size reads and writes to flash media at a granular level to avoid unnecessary data reads and writes to reduce latency, enhance backend performance, and extend flash media lifespan to lower the total cost of ownership (TCO) for storage.
- **Autonomic cache offload:** Reduces cache bottlenecks by automatically changing the frequency at which data is offloaded from cache to flash media based on utilization rate. This helps achieve consistently high performance levels as you scale up the workload to millions of IOPS.
- **Multi-tenant I/O processing:** Enables performance improvement for mixed workloads or virtual desktop infrastructure (VDI) deployments by breaking large I/O into smaller chunks so that small read requests don't get held up behind larger I/O requests, which helps ensure reduced latency.
- **Adaptive Flash Cache:** A feature that allows SSDs to act as a true extension of DRAM cache. This feature can improve throughput and reduce latency⁶ with HPE 3PAR StoreServ Storage arrays that are configured with SSDs.
- **Express Writes:** Write acceleration that helps optimize CPU utilization and, depending on workload, delivers greater throughput, up to 30% more IOPS, and up to 20% reduced latency.⁷
- **Quality of Service (QoS) controls:** Reduce contention and certify that performance is delivered where you need it to support multi-tenancy. Optional software lets you quickly and easily assign minimum goals for I/O per second, bandwidth, and latency to protect mission-critical applications in enterprise environments (see sidebar).
- **Adaptive Sparing** is a feature of the HPE 3PAR Operating System that leverages the system's sparing approach to improve the performance and endurance of flash. Other architectures often reserve entire drives to use as "hot" spares—these drives are not used unless another drive in the system fails which is expensive and inefficient. Instead, the HPE 3PAR architecture the system reserves a small amount of "spare" space in each drive. HPE 3PAR StoreServ's patented Adaptive Sparing technology takes the spare space and hands it back to the drive's firmware to increase the internal capacity used by the drive for housekeeping tasks. Adaptive Sparing allows the drive to consume all unused space on the drive to extend its internal housekeeping space. Adaptive Sparing technologies are so powerful they can increase SSD endurance up to 5X over the drive's standalone endurance capability while also increasing write performance. Adaptive Sparing is the foundation behind HPE 3PAR StoreServ's unconditional 5-year warranty on all SSDs.⁸

Boost all-flash SAN performance further by upgrading SAN infrastructure to Gen6 32Gb FC

When replacing traditional HDD storage with hybrid or especially all-flash arrays to serve high-performance workloads, it is critical to consider the role of your storage network and confirm that it is not acting as a bottleneck. For example, a typical OLTP workload can saturate 8 Gb host Fibre Channel (FC) bandwidth without fully utilizing all of your compute or storage resources. To ensure you receive the anticipated returns on your all-flash investments, you may need to consider increasing your storage networking performance with Gen5 16Gb FC technology or even Gen6 32Gb FC.

HPE 3PAR StoreServ Storage support for 16 Gb FC offers a simple and immediate SAN performance solution. By replacing older 8 Gb FC SAN components with Gen5 16 Gb FC on your all-flash HPE 3PAR StoreServ array, HPE StoreFabric FC switch and host FC HBAs, you can significantly increase I/O bandwidth and IOPS with lower latency too for latency sensitive applications. By replacing SAN infrastructure HPE StoreFabric FC host bus adapters and switching to Gen6 32Gb FC while the target is at 16Gb FC, you can boost performance even further without any performance tuning for applications like MS SQL 2016 running a data warehouse workload, see Demartek Evaluation results in listed in this data sheet. With older 4 Gbps FC infrastructure end-of-support life (EOL) and 8 Gb FC infrastructure starting to EOL, now is the time to evaluate 16 Gb Gen5 technology or Gen6 32Gb FC for your flash deployments.

Avoid downtime and consolidate with confidence

A unique suite of persistent and encryption technologies power HPE 3PAR StoreServ 8000 Storage in delivering high-availability and Tier-1 resiliency to performance-critical applications:

- **Persistent Cache:** Preserves service levels, so they are not impacted by unplanned component failures—a key requirement for the virtual data center.

HPE 3PAR Flash Now: Maintain control of your data for less than the cost of outsourcing it to the public cloud

Evaluating the cloud but not sure you're ready to surrender your data? Looking to reduce storage costs but don't like the idea of ceding control and stomaching new security risks? Then it's time to look at new ways to plan for, acquire and consume your data storage.

HPE 3PAR Flash Now is a new program that brings public cloud-like economics to your on-prem flash storage deployment. With this new program, you **get only the best of on-prem and cloud** with none of the drawbacks. Retaining total control and uncompromising security for the data you need to keep on-prem but benefit from converting OPEX to CAPEX and a host of other benefits that come with the program, such as non-disruptive, automated data migration and a built-in tech refresh options that keep you up to date on the latest flash and data protection technologies.

With 3PAR Flash Now, you'll be up and running with your new all-flash HPE 3PAR StoreServ Storage before you ever pay HPE a cent for your new flash storage infrastructure and you'll only pay pennies per usable gigabyte per month. The program's built-in utility consumption model lets you scale your flash storage use up or down while only paying for what you consume. Best of all, you'll own your own destiny by keeping maintaining control of your data for less than the cost of outsourcing it to the public cloud.

- **Persistent Ports:** Allows non-disruptive upgrades to HPE 3PAR StoreServ 8000 Storage systems without relying on multi-pathing software and without initiating failover. This feature also automatically fails over a front-end controller node port that experiences physical connection loss due to a cable or switch failure in order to preserve service levels.
- **Persistent Checksum:** Ensures end-to-end data integrity, protecting against silent corruption from the host to the storage array.
- **Peer Persistence:** Delivers effortless resilience that comes with VMware vSphere® Metro Storage Cluster (vMSC) certification and support for Microsoft Windows Server® and Microsoft Windows® Hyper-V environments. With Peer Persistence, you can also federate storage across data centers without being constrained by physical boundaries. Automated failover and failback between two sites or data centers is transparent to hosts, which keeps your virtualized deployments seamlessly running even in the event of a disaster. With support for a third data center the HPE 3PAR Peer Persistence solution provides extreme data protection where customers have not only non-disruptive data mobility in case of local storage failure, but also a complete disaster recovery plan by replicating the same data to a third site. Peer Persistence configurations provide the best in class high availability solution combined with an efficient disaster recovery solution based on asynchronous periodic replication.
- **Data-at-Rest Encryption:** Protects your data from both internal and external security breaches. If your application or environment requires protection from unauthorized access of the data, then consider the HPE 3PAR StoreServ Data-at-Rest Encryption solution. HPE 3PAR StoreServ models are fully FIPS 140-2 compliant, support intelligent key management, and available with self-encrypting drives (SEDs), where data is encrypted as it is written to the drive. You get peace of mind in knowing that all user data contained on these drives is protected against unauthorized access, regardless of hardware theft, drive failure, or drive retirement. HPE 3PAR Data-at-Rest Encryption supports all of the advanced data services on HPE 3PAR StoreServ Storage.

Affordable, flexible disaster recovery

In order to meet service-level demands for modern IT and cloud environments, high availability and uncompromising data protection are necessary. With HPE 3PAR StoreServ 8000 Storage, you can dramatically reduce the cost of remote data replication and disaster recovery with highly efficient, multi-mode replication across all HPE 3PAR StoreServ models. HPE 3PAR Remote Copy Software, including support for true asynchronous streaming, allows you to achieve low recovery time objectives (RTOs) and zero-data loss recovery point objectives (RPOs) with complete distance flexibility. In addition, since HPE 3PAR Remote Copy configuration is autonomic, set-up only requires one step so you can protect your data from the start.

Respond effortlessly to unpredictable and changing demands

The one thing we know about the future is that it is unpredictable. So how do you prepare for data growth and new business initiatives in such an environment? You need storage that gives you the power to master the unpredictable. Storage that is scalable and can grow with you. Storage that is adaptable, so it supports a variety of different applications and workloads without sacrificing performance. Storage that supports non-disruptive data mobility, so the right data is in the right place at the right time, and painful data migrations are a thing of the past. And you need it all for a price you can afford.

With HPE 3PAR 8000 StoreServ Storage, you get rich storage federation capabilities among all HPE 3PAR StoreServ Storage array models, such as bi-directional data mobility. With this capability, you get the agility and flexibility to run workloads at the right cost and service level with one-click workload rebalancing (figure 4).

- Non-disruptively shift data between HPE 3PAR StoreServ 8000 Storage and any other HPE 3PAR StoreServ array without additional management layers, appliances, or overhead impact to host resources
- Map workloads to the right resources and establish tiers of storage across a data center for different SLAs
- Lower costs and manage capacity at a data center level by thinly provisioning volumes with the freedom to move data between systems non-disruptively

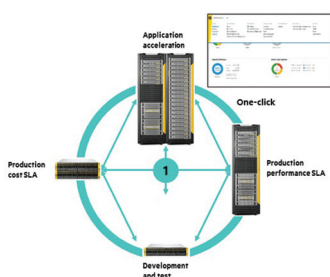


Figure 4. An elastic resource pool with one-click workload balancing

Refreshing your storage technology is effortless

With HPE 3PAR StoreServ Storage, you can refresh technology effortlessly by streamlining the movement of data from older third-party source systems and non-disruptively update storage without application impact. If you are looking to consolidate your HDS arrays, IBM XIV, EMC VMAX, EMC DMX4 CLARiiON CX4, DMX4 or VNX arrays, HPE 3PAR Online Import Software make it easy for you. Also, Online Import support will be available within SSMC for IBM XIV.

Get more out of your virtualization deployment

HPE 3PAR StoreServ Storage is built to deliver performance that exceeds even the most stringent application demands along with transformative levels of simplicity, agility, and efficiency. Integration with Microsoft System Center and VMware® vCenter™ gives you enhanced visibility into storage resources and precise insight into how VMs are mapped to data stores and system volumes. Support for VMware Virtual Volumes (VVOLs) enables granular VM-level storage control, disaster recovery, and QoS in environments with VMware vSphere.

Integration with VMware vSphere API for Array Integration (VAAI), VMware vStorage APIs for Storage Awareness (VASA), Microsoft Offload Data Transfer (ODX), and thin provisioning enable HPE 3PAR StoreServ Storage to improve virtual infrastructure performance, efficiency, and scalability. Low latency levels allow you to get more out of your VMware deployment, where extensive use of virtual memory pages to disk can limit VM consolidation on physical servers when paired with legacy storage.

If you are looking for virtually instant application-consistent backups for your VMware environment, look no further than rapid and granular backup and recovery with HPE StoreOnce Backup. With HPE StoreOnce Recovery Manager Central, you get fast, efficient, flat backup from HPE 3PAR StoreServ Storage to HPE StoreOnce Backup. This solution transforms traditional approaches to backup and recovery, giving you application-aware, storage-integrated data protection that bypasses traditional backup server-based processes.

Technical specifications

	HPE 3PAR StoreServ 8200 Converged Flash	HPE 3PAR StoreServ 8400 Converged Flash	HPE 3PAR StoreServ 8440 Converged Flash	HPE 3PAR StoreServ 8450 All-Flash
Controller nodes	2	2 or 4	2 or 4	2 or 4
Maximum total cache	832 GiB	1664 GiB	8384 GiB	384 GiB
Maximum on-node cache	64 GiB	128 GiB	384 GiB	384 GiB
Total flash cache	768 GiB	1536 GiB	8000 GiB	N/A
Maximum number of HDDs	240	576	960	N/A
Maximum number of SSDs	120	240	480	480
Maximum raw capacity	1000 TiB	2400 TiB	4000 TiB	3351 TiB
Maximum raw capacity (SSD only)	838 TiB	1676 TiB	3351 TiB	3351 TiB
Maximum usable file capacity	2.7 PiB	6 PiB	10.8 PiB	9.8 PiB
16 Gbps Fibre Channel host ports	4-12	4-24	4-24	4-24
10 Gbps iSCSI host ports	0-4	0-8	0-8	0-8
10 Gbps FCoE host ports	0-4	0-8	0-8	0-8
1 Gbps Ethernet Adapter	0-8	0-16	0-16	0-16
10 Gbps Ethernet Adapter	0-4	0-8	0-8	0-8
Built-in 1 Gbps ports	2	2-4	2-4	2-4

The complete HPE 3PAR software portfolio



Manage

StoreServ Management Console
Command Line Interface
System Reporter
Service Processor
File Persona
Smart SAN
HPE OneView integration
WSAPI, SMI-S, and SNMP
OpenStack integration
VMware integration
Docker containers support



Protect

Remote Copy
Peer Persistence & CLX
Recovery Manager Central
Data-at-rest encryption
File Store snapshots
Persistent Checksum
Persistent Cache
Persistent Ports
Virtual Lock and File Lock
VSS Provider



Optimize

Adaptive Sparing
Adaptive Flash Cache
Priority Optimization
Federation (Peer Motion, Online Import)
Adaptive Optimization
Express Protect
Adaptive Reads and Writes
Express Writes
Autonomic Cache Offload
Mixed Workload Technology



Efficient

Zero Detect
Deduplication
Compression
Data Packing
Thin Provisioning
Virtual Copy
Thin Conversion
Thin Persistence
Express Layout
Express Indexing
Express Scan

Predictive analytics powered by StoreFront remote

Manage: Everything you need to get up and running quickly and efficiently

Simplified management is offered by the **HPE 3PAR StoreServ Management Console (SSMC)**. The scriptable **HPE 3PAR Command Line Interface (CLI)** gives you powerful customization capabilities that are simple to configure and reduce the need for extra management tools. **HPE 3PAR System Reporter** helps track performance and capacity utilization trends for multiple HPE 3PAR StoreServ systems. Remote error detection along with support for diagnostics and maintenance activities is offered via **HPE 3PAR Service Processor**. Rich file protocols from SMB/CIFS to NFS and FTP, and a RESTful Object Access API for programmatic access to files are offered with **HPE 3PAR File Persona**. Built-in automated SAN configuration is offered with **HPE 3PAR Smart SAN**. **HPE OneView integration**, gives you a web-based interface that is common and across enterprise servers, storage, and networking. Support for the **Storage Management Initiative Specification (SMI-S)** provides simplified storage management from within the Microsoft System Center Management framework. With **OpenStack integration**, over both iSCSI and Fibre Channel protocols, the flexibility and cost-effectiveness of a highly resilient cloud-based open source platform that meets the requirements of your mission-critical applications, is offered. **HPE 3PAR StoreServ Storage integration with VMware vSphere** enables you to take advantage of architectural benefits such as wide striping, a Mesh-Active clustered controller design, mixed workload support, and hardware-assisted VMware vSphere APIs for Array Integration (VAAI) support. **Docker containers support** helps deliver enterprise-grade storage availability, resiliency, and performance for stateful containers.

Protect: Safeguard your most mission-critical of applications

HPE 3PAR Remote Copy offers simple and cost effective data protection for efficient multi-tenant disaster recovery. **HPE 3PAR Peer Persistence** ensures transparent autonomic failover over metropolitan distances. **HPE 3PAR Cluster Extension Software** enables automatic failover across data centers using Remote Copy Asynchronous mode. **HPE Recovery Manager Central** allows you to create, manage, and automate crash-consistent snapshots for any application and app-consistent snapshots for VMware vSphere, Microsoft SQL Server, Oracle, and SAP HANA®. **HPE 3PAR StoreServ Data-at-Rest Encryption** protects data from both internal and external security breaches by securely encrypting all data as it is written to the drive. End-to-end data integrity, protection against silent corruption from the host to the storage array is offered via **HPE 3PAR Persistent Checksum**. **HPE 3PAR Persistent Cache** maintains service levels, so they are not impacted by unplanned component failures—a key requirement for the virtual data center. Non-disruptive upgrades to HPE 3PAR StoreServ 8000 Storage systems without relying on multi-pathing software and without initiating failover is initiated via **HPE 3PAR Persistent Ports**. **HPE 3PAR Virtual Domains and HPE 3PAR Virtual Lock Software** helps segregate access and deliver robust storage services for different applications and user groups with additional security attached to the retention of storage volumes. **HPE 3PAR File Lock** enables data preservation to meet the enterprise governance requirements.

Optimize: Make the best use of the available storage capacity

HPE 3PAR Adaptive Sparing leverages the system's sparing approach to improve the performance and endurance of flash. Performance acceleration is assured by **HPE 3PAR Adaptive Flash Cache**, which reduces application response times. **HPE 3PAR Priority Optimization** assures service levels with QoS controls for mission-critical applications. **HPE 3PAR Peer Motion** enables load balancing at will, wherein movement of data and workloads between arrays does not impact, applications, users, or services. **HPE 3PAR Online Import** is included to enable migration from HPE EVA, EMC, HDS, or IBM Storage systems. **HPE 3PAR Adaptive Optimization** improves storage utilization by enabling cost-optimized storage tiering. **HPE 3PAR Express Protect** enables backups to StoreOnce—all through the familiar RMC GUI. **HPE 3PAR Adaptive Reads and Writes** help to avoid unnecessary data reads and writes to reduce latency, enhance backend performance and extend flash media lifespan. **HPE 3PAR Express Writes** enhances write acceleration that helps optimize CPU utilization and depending on workload, delivers greater throughput. **HPE 3PAR Autonomic cache offload** helps reduce cache bottlenecks by automatically changing the frequency at which data is offloaded from cache to flash media based on utilization rate. **HPE 3PAR Multi-tenant I/O processing** enables performance improvement for mixed workloads or virtual desktop infrastructure (VDI) deployments by breaking large I/O into smaller chunks so that small read requests don't get held up behind larger I/O requests, ensuring reduced latency.

Efficient: Get maximum performance with minimum expenditure

HPE 3PAR Zero Detect reduces the cost of storage by identifying and removing repeated data from incoming data streams. **HPE 3PAR Deduplication** helps reduce the amount of flash needed to store data by preventing the storage of duplicate data. **HPE 3PAR Compression** helps reduce the amount of flash needed to store data by reducing the data footprint. **HPE 3PAR Data Packing** helps improve storage efficiency and bandwidth by condensing multiple smaller data sets together. **HPE 3PAR Virtual Copy Software** protects and shares data affordably with rapid recovery using reservation-less, non-duplicative, copy-on-write snapshots. **HPE 3PAR Thin Technologies**—including **HPE 3PAR Thin Provisioning, Thin Conversion, Thin Persistence, and Thin Copy Reclamation**—achieve data compaction by leveraging built-in hardware capabilities. **HPE 3PAR Express Layout** allows HPE 3PAR controller nodes to share access to SSDs in order to drive efficiency. **HPE 3PAR Express Indexing** helps deduplicate data inline and with a high degree of granularity. **HPE 3PAR Express Scan** helps remove redundant data inline and prevents wastage of CPU cycles.

Get connected and get back to business

Unlock all of the benefits of your technology investment by connecting your products to HPE Enterprise. Achieve up to 77%⁹ reduction in down time, near 100%¹⁰ diagnostic accuracy and a single consolidated view of your environment. By connecting, you will receive 24x7 monitoring, pre-failure alerts, automatic call logging and automatic parts dispatch. HPE Proactive Care Service and HPE Datacenter Care Service customers will also benefit from proactive activities to help prevent issues and increase optimization. All of these benefits are already available to you with your server, storage and networking products, securely connected to HPE support.

⁹IDC

¹⁰HPE CSC reports 2014–2015

HPE Technology Services

The support services portfolio will help complement the performance and reliability of the HPE 3PAR StoreServ Storage infrastructure. HPE provides complete, end-to-end lifecycle services for your entire infrastructure—servers, storage, networks, and software. Our services also help you consolidate your support management and whenever necessary, we collaborate with independent software vendors directly. By integrating hardware and software services, we offer you a support experience that is relevant to your business needs.

Advise, transform, and integrate

Navigate through the complexities of storage, backup, archive, disaster recovery, and Big Data with advisory, transformation and integration consulting.

Deploy and implement

Access expertise to support deployment, operations, relocation, sanitization, and disposal plus improvement-focused education.

Operate and support

Find the level of personalized, proactive, and simplified support right for your business.

HPE Foundation Care

A comprehensive suite hardware and software services aimed to help increase the availability of IT infrastructure.

HPE Proactive Care

An integrated set of reactive and proactive services designed to help you improve the stability and operation of your converged infrastructure to achieve better business outcomes. HPE Proactive Care has been specifically designed to support devices in IT environments, providing enhanced support that covers servers, operating systems, hypervisors, storage, storage area networks (SANs) and networks.

HPE Proactive Care Advanced

This service expands on HPE Proactive Care Service and is designed to help maximize the benefits of IT investments, maintain IT infrastructure stability, achieve business and IT project objectives, reduce operational costs and free IT staff for other priority tasks. An assigned HPE Account Support Manager (ASM) provides personalized technical and operational advice, including HPE best practices gleaned from HPE's broad support experience.

HPE Datacenter Care

HPE's most comprehensive support solution tailored to meet specific data center support requirements. It offers a wide choice of proactive and reactive service levels to cover requirements ranging from the most basic to the most business-critical environments.

HPE Lifecycle Event Services

These services are sold on a per-event basis and include services to help deploy technologies and solutions as well as assessments and other services to help optimize and operate the IT infrastructure.

Learn more at **HPE 3PAR StoreServ 8000**



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