

HP 3PAR StoreServ 20000 Storage Family



Enterprise flash for on-demand and hybrid IT

Key features and benefits

Scalable—to meet growing enterprise requirements

- Scale capacity up to 6 PiB raw and 15 PiB usable with up to eight controllers in a Mesh-Active cluster
- Reduce performance bottlenecks with flash-optimized hardware and software for greater than 3 million IOPS at sub-millisecond latencies
- Lower the cost of all-flash to \$1.50 USD per GB usable without sacrificing performance
- Achieve a 7X density advantage or more with 5.5 PiB of usable capacity in a single expansion rack
- Cut capacity requirements 75 percent without sacrificing performance

Flexible—to meet unpredictable business demands

- Support the most rigorous, on-demand infrastructure with a virtually limitless, elastic pool of storage
- Run workloads at the right cost and SLA with one-click workload balancing
- Slash management overhead with unified management of block, file, and object access and storage that is self-configuring, self-provisioning, and self-optimizing

Resilient—so you can consolidate with confidence

- Maintain high availability and Tier-1 resiliency with a complete set of persistent technologies
- Deliver consistent QoS with HP 3PAR Priority Optimization Software
- Achieve application-integrated recovery with near-synchronous RPOs
- Protect against unauthorized access with Data-at-Rest Encryption
- Simplify backup and restore with HP StoreOnce Recover Manager Central for application-aware, storage-integrated data protection

Futureproof—to support hybrid and on-demand computing

- Modernize your EMC and HDS storage infrastructure with painless, no-cost data migration
- Seamlessly move data between any model HP 3PAR StoreServ array
- Boost flash performance by 35 percent and reduce latency by 2.5X with 16 Gbps Fibre Channel

Enterprise flash meets modern, Tier-1 storage

Have cloud and IT-as-a-service (ITaaS) environments forced you to settle for Tier-1 storage that compromises on performance, scalability, or data protection? Are you interested in processing six times more transactions per second with 90 percent fewer disks? Do you need massive consolidation—for block and file workloads as well as object access—with assured quality of service (QoS)?

The HP 3PAR StoreServ 20000 Storage family is a new class of enterprise flash arrays for massive consolidation of your most demanding workloads, with greater than 3 million IOPS, sub-millisecond latencies,¹ a 7X density advantage over the competition,² and scalability to 15 PiB of usable capacity.³ The family's flash-optimized architecture features the HP 3PAR Gen5 Thin Express ASIC for silicon-based hardware acceleration, including inline deduplication, thin provisioning, and other compaction technologies that can reduce acquisition and operational costs by up to 75 percent without compromising performance.⁴

With unmatched versatility, performance, and scalability, HP 3PAR StoreServ 20000 Storage has you covered. A choice of models gives you a range of options that support true convergence of block and file protocols, all-flash array performance for \$1.50 USD per gigabyte usable,⁵ and the use of spinning media to further optimize costs.

And it does this while delivering all the enterprise-class, Tier-1 features and functionality you have come to expect from the storage platform that powers many of the world's largest service providers. Enhanced storage capabilities provide continuous data access and fine-grained QoS controls ensure predictable service levels to each of your applications, workloads, and tenants without physical partitioning of resources. In addition, bi-directional data mobility allows you to create virtually limitless, elastic pools of storage to support rigorous on-demand infrastructure.

With support for asynchronous streaming replication, you'll be able to dramatically reduce the cost and complexity of data protection with disaster recovery that can be set up and tested in only minutes and is supported across all models in the HP 3PAR StoreServ Storage family (figure 1). HP 3PAR StoreServ 20000 also supports flat backup to HP StoreOnce Backup appliances for simple and efficient data protection that eliminates traditional backup processes.

Figure 1. HP 3PAR StoreServ Storage Models

Next-generation HP 3PAR StoreServ Storage portfolio

- One operating system
- One interface
- One feature set
- Block, file, and object access

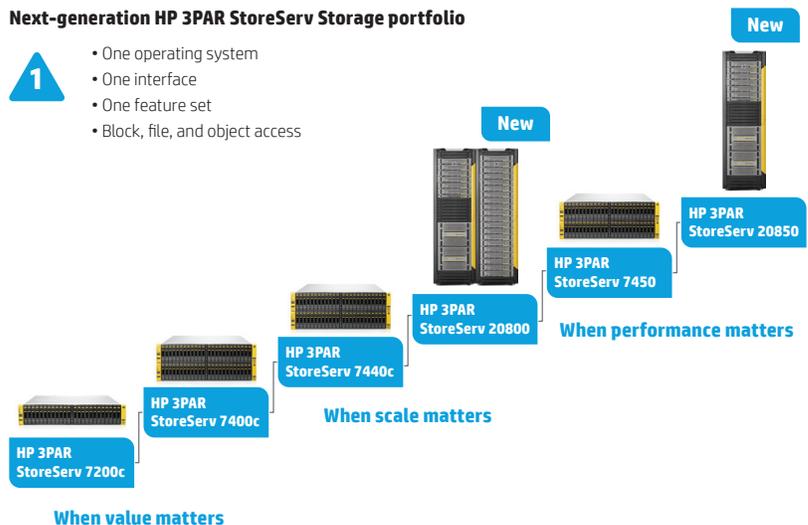
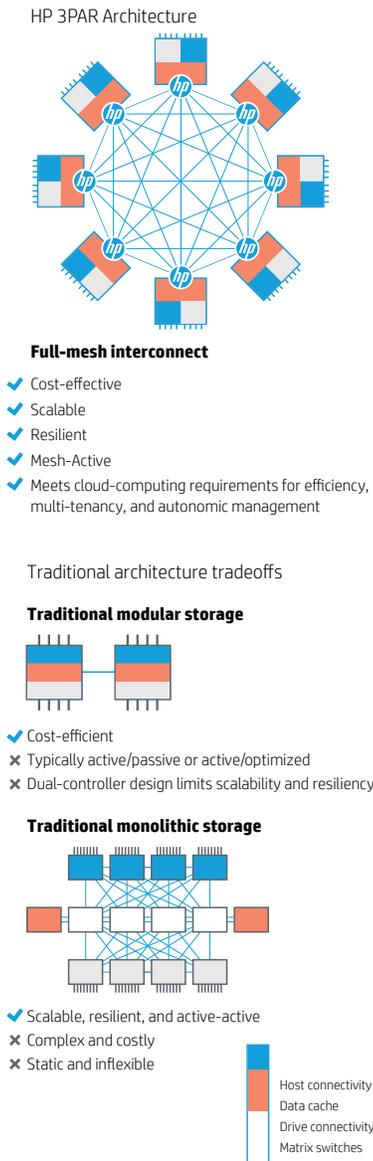


Figure 2. Traditional storage architecture vs. HP 3PAR StoreServ



A new class of enterprise flash for massive consolidation and density

Adaptive Sparing and our compaction technologies not only drive flash affordability, but also improve scalability, specifically with relation to density.

Extending usable capacity by 75 percent⁹ means you can consolidate more data in a smaller footprint to accommodate:

- 280 TiB usable capacity in a drive enclosure
- 5.5 PiB usable capacity in a single rack
- 15 PiB usable capacity in a single HP 3PAR StoreServ 20800 system

Scalable—to meet growing enterprise requirements

HP 3PAR StoreServ 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 also enable high levels of performance for both spinning and flash media.

This flash-optimized architecture allows the HP 3PAR StoreServ 20000 Storage family to deliver multi-petabyte scalability with accelerated performance of over 3 million IOPS and sub-millisecond latency. This flash-optimized architecture relies on several unique HP 3PAR StoreServ innovations:

- **Unique, clustered, Mesh-Active architecture (figure 2):** Up to eight 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.
- **HP 3PAR Gen5 Thin Express ASIC:** Supports mixed workloads and enables thin technologies including inline deduplication with high performance levels to alleviate legacy storage performance concerns. The Thin Express ASIC supports mixed workloads with extremely high performance levels so that transaction- and throughput-intensive workloads run on the same storage resources without contention, enabling consolidation without compromise.
- **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 system cache. This feature can improve throughput and reduce latency⁶ with HP 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 percent more IOPS, and up to 20 percent reduced latency.⁷

Flash-based storage you can afford

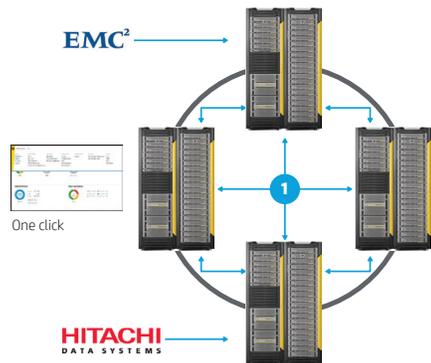
HP 3PAR StoreServ Storage is and will continue to be on the cutting edge for flash media innovation to lower cost. Technologies built into the HP 3PAR OS allow you to get the most out of your flash investments by protecting them with extended media lifespan, which is why all HP 3PAR SSDs come with a 5-year warranty that includes replacement of the SSDs for any failure including write wear-level limit.

Adaptive Sparing technology, which is a feature of the HP 3PAR Operating System (HP 3PAR OS), extends flash-based media endurance by adjusting the system’s sparing approach to help minimize impact on SSDs. While other architectures generally reserve entire drives to use as spares, in the HP 3PAR architecture, the system reserves spare chunklets within each drive. Not only does this improve SSD endurance, but also allows HP 3PAR StoreServ Storage to extend useable capacity per drive by up to 20 percent.⁸

Another feature of the 3PAR OS, HP 3PAR Thin Deduplication Software with patented Express Indexing delivers inline deduplication with hardware acceleration at scale. Thin Deduplication runs on any HP 3PAR StoreServ array with an SSD tier to increase usable capacity, lower total cost of ownership, and extend flash media lifespan.

When combined with new high-density 3.84 TB commercial MLC (cMLC) SSDs, HP 3PAR compaction technologies lower the cost of flash storage to below that of spinning media. In cases where there is a large amount of duplicate data, HP 3PAR Thin Deduplication Software also improves write throughput and performance. Other storage architectures that support deduplication are not able to offer these benefits at the same capacity and scale at the same performance level.

Figure 3. An elastic resource pool with one-click workload balancing



Up to 60 PIB and 10 million IOPS of federated storage with zero added overhead

Flexible—to meet unpredictable business demands

Meet the needs of today's dynamic applications with the ability to move data and workloads not just between tiers, but between arrays—without impact to applications, users, or services. With HP 3PAR 20000 StoreServ Storage, you get rich storage federation capabilities, 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 3).

- Non-disruptively shift data between HP 3PAR StoreServ 20000 Storage enterprise flash arrays and any other HP 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 non-disruptively move data between systems.

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

HP 3PAR StoreServ Management Console (SSMC) offers a modern look and consistent feel for all HP 3PAR StoreServ arrays, making management effortless. Flexibly manage block, file, and object access from a single interface serving diverse workloads. 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 HP 3PAR System Reporter to help you optimize and plan future configuration changes to improve infrastructure investments.

Storage customized for your applications

Your critical business infrastructure and applications require a single storage infrastructure that can deliver the service levels, application availability, and efficiencies that your business requires. HP 3PAR StoreServ 20000 Storage allows you to consolidate applications onto a single, high-performance system, giving your business the flexibility to meet changing business needs, on demand.

Get more out of your virtualization deployment

HP 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 datastores and system volumes. Support for VMware Virtual Volumes (vVols) enables granular VM-level storage control, disaster recovery, and QoS in environments with VMware vSphere 6.

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 HP 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. By contrast, deploying HP 3PAR StoreServ Storage enables you to double VM density on your physical servers—guaranteed.¹⁰

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 HP StoreOnce Backup. With HP StoreOnce Recovery Manager Central, you get fast, efficient, flat backup from HP 3PAR StoreServ Storage to HP 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.

Make your databases more efficient, without tradeoffs

Database performance and availability are so critical that many organizations apply generous capacity and management resources to maintain needed service levels. HP 3PAR StoreServ 20000 Storage removes these inefficiencies, helping eliminate tradeoffs between capacity utilization, efficiency, and performance. For example, with HP 3PAR Thin Persistence

Software and Oracle ASM Storage Reclamation Utility (ASRU), your Oracle databases stay thin by autonomically reclaiming stranded database capacity. And HP offers the cost-effective Oracle- and SQL-aware snapshot technologies, HP 3PAR Recovery Manager for Oracle and HP 3PAR Recovery Manager for SQL. Low latency levels meet the requirements of response-time sensitive applications such as Oracle database and Microsoft Exchange.

Given the importance of Microsoft Exchange for mission-critical email communications, many organizations devote significant amounts of storage capacity and management resources to this essential application. HP 3PAR StoreServ 20000 Storage enables you to support a large number of mailboxes with a larger size limit while reducing cost per mailbox from dollars to cents. In addition, with HP 3PAR Recovery Manager for Exchange, you can recover email messages quickly, affordably, and from multiple points in time.

Resilient—so you can consolidate with confidence



Converged data protection with HP StoreOnce Backup

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 HP StoreOnce Backup. With HP StoreOnce Recovery Manager Central, you get fast, efficient, flat backup from HP 3PAR StoreServ Storage to HP 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.

By connecting HP 3PAR StoreServ Storage directly to HP StoreOnce Backup, you can maintain business productivity by expediting the backup and recovery process and eliminating application performance impact. This streamlined backup process also reduces total cost of ownership for storage by leveraging HP StoreOnce Backup systems for cost-effective backup retention. The native movement of snapshots from HP 3PAR StoreServ Storage to HP StoreOnce Backup assures that any online storage threats are quickly mitigated with always-available, single-click data recovery. This is all made possible by HP StoreOnce Recovery Manager Central, which allows VMware owners to seamlessly manage snapshots, backup, and recovery directly from within VMware vCenter.

With a modern architecture that provides true convergence of block, file, and object access while helping eliminate single points of failure, HP 3PAR StoreServ Storage delivers Tier-1 resilience paired with secure administrative segregation of users, hosts, and application data. A unique set of data protection and security products power HP 3PAR StoreServ 20000 Storage in delivering high availability and resilience for multi-tenant cloud and ITaaS environments. Serve multiple user groups and applications from a single storage system with complete confidence that access to your data will not be compromised or interrupted. Ensure data protection at the array level, across the data center, and with a robust backup and recovery strategy.

Persistent technologies meet virtual datacenter demands

On HP 3PAR StoreServ 20000 Storage, Tier-1 resiliency is supported by persistent technologies unique to the platform:

- **Persistent Cache:** The use of Persistent Cache preserves service levels so they are not impacted by unplanned component failures—a key requirement for the virtual data center.
- **Persistent Ports:** A software feature allows non-disruptive upgrades to HP 3PAR StoreServ 20000 Storage systems, Persistent Ports means you don't have to relying on multi-pathing software or failover initiation. 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:** Federate storage across data centers, regardless of physical boundary constraints. Automated failover and failback between two sites or data centers is transparent to hosts, which keeps your VMware deployments seamlessly running even in the event of a disaster.

Secure multi-tenancy and data encryption support massive consolidation

Security concerns should not stand in your way when it comes to infrastructure consolidation. For this reason, HP 3PAR StoreServ 20000 Storage supports the security features you need, such as:

- **Virtual Domains:** Unlike the use of multiple storage systems or traditional array partitioning schemes that rely on the physical segregation of resources, HP 3PAR Virtual Domains uses a policy-based, logical implementation that preserves the benefits of distributing and sharing each application workload across all system resources. Virtual Domains is ideal for those who understand the benefits of consolidation but must enable secure, independent storage services to multiple administrators, applications, departments, and customers.
- **Data-at-Rest Encryption:** For environments that requires protection from unauthorized data access, encryption protects your data from both internal and external security breaches. HP 3PAR StoreServ 20000 Storage is fully FIPS 140–2 compliant, supports local and enterprise key managers that are FIPS certified and KMIP-compliant, and is available with encrypted FIPS 140–2 validated drives. These drives protect against unauthorized access, even if a drive is stolen, fails, or has to be retired.
- **Virtual Lock:** HP 3PAR Virtual Lock Software enables organizations to securely lock down storage volumes, allowing read access but preventing accidental or intentional deletion. When used in conjunction with reservationless, nonduplicative snapshots, Virtual Lock delivers an efficient approach to governance and legal discovery.

Figure 4. One software license for simple, efficient and flexible disaster recovery

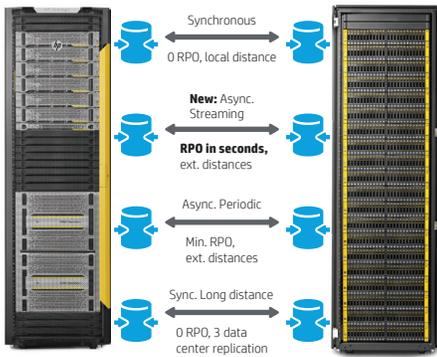


Table 1. HP 3PAR Remote Copy Software benefits

Key attribute	HP 3PAR	Other vendors
Autonomic configuration: Set up and test DR in minutes without professional services	✓	✗
Ease of operation: Unified management console for “do-it-yourself” DR	✓	✗
Cost efficiency: Multi-mode, multi-site replication supported between high-end and midrange arrays, keeping costs down	✓	✗
Capacity efficiency: Thin provisioning-aware replication cuts capacity purchases by 50 percent or more ¹²	✓	✗
Any-to-any native replication: Flexibly mirror data between any HP 3PAR StoreServ model and varying service level (RAID level, drive type, and more)	✓	✗

Looking to replace your EMC or HDS array and cut capacity in half?

With HP 3PAR StoreServ Storage, you can save on the cost of a storage technology refresh and then maximize storage ROI over time by keeping incremental purchases, administration, and operating costs to a minimum. In fact, the HP Get Thin Guarantee promises a minimum 50 percent reduction in capacity requirements when you replace legacy storage with HP 3PAR StoreServ Storage—guaranteed.¹³

Deliver uncompromising QoS for your most demanding workloads

Achieve higher service levels for more users and applications with less infrastructure. When combined with Tier-1 resiliency, the multi-controller scalability and extreme flexibility built into HP 3PAR StoreServ Storage makes deploying and maintaining separate storage silos to deliver different QoS levels obsolete.

High and predictable levels of service for all workload types are assured through the massively parallel and fine-grained striping of data across all internal resources (disks, ports, loops, cache, processors, and more). With this massive and fine-grained approach, as use of the system grows—or in the event of a component failure—service conditions remain high and predictable.

With HP 3PAR Priority Optimization Software, you can reduce contention by limiting maximum performance or setting a minimum goal for IOPS and bandwidth for a specific application, tenant, or workload. It provides high-priority applications with all the resources they need to meet service levels. It enables certainty and predictability for all applications and tenants.

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

Affordable, flexible disaster recovery

High availability and uncompromising data protection are necessary for any enterprise data center. With HP 3PAR StoreServ 20000 Storage, you can dramatically reduce the cost of remote data replication and disaster recovery with highly efficient, multi-mode replication across all HP 3PAR StoreServ models (figure 4).

In order to meet service-level demands for modern IT and cloud environments, high availability and uncompromising data protection are necessary. With HP 3PAR StoreServ 2000 Storage, you can decrease downtime while dramatically reducing the cost of remote data replication and disaster recovery with highly efficient, multi-mode replication across all HP 3PAR StoreServ models.

HP 3PAR Remote Copy Software, including new support for true asynchronous streaming (table 1), allows you to achieve low recovery time objectives (RTOs) and zero-data-loss recovery point objectives (RPOs) with complete distance flexibility.¹¹ And since HP 3PAR Remote Copy configuration is autonomic, set-up only requires one step so you can protect your data from the start. Refer to the [HP 3PAR Replication Software Suite data sheet](#) for additional details on Remote Copy and related functionality.

HP 3PAR Peer Persistence Software, with VMware vSphere Metro Storage Cluster (vMSC) certification and support for Microsoft Windows Server® and Microsoft Windows® Hyper-V environments, delivers automated failover and failback between two sites or data centers that is transparent to hosts, which keeps your VMware deployments seamlessly running even in the event of a disaster.

Futureproof—to support on-demand computing

Data center transformation to address on demand computing is an investment. Protect your investment and maximize its effectiveness both today and into the future with a storage solution that not only aids you with today’s data center refresh, but also ensures that your storage assets and infrastructure are always optimized for your workloads.

Refreshing your storage technology is effortless

With HP 3PAR StoreServ Storage, you can refresh technology effortlessly by streamlining the movement of data from older systems and non-disruptively update storage without application impact. If you are looking to consolidate your HDS arrays, EMC Symmetrix VMAX, CLARiiON CX4, or VNX arrays, HP 3PAR Online Import Software make it easy for you.

Every HP 3PAR StoreServ Storage system comes with this software at no additional charge for 180 days—giving you painless, non-disruptive migration. And if you are currently an HP EVA Storage customer, you can use HP 3PAR Online Migration to import data from your EVA system onto your new HP 3PAR StoreServ array, providing you with a simple upgrade path.

Boost flash performance by 35 percent and reduce latency by 2.5X with 16 Gbps Fibre Channel

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

HP 3PAR StoreServ Storage support for 16 Gbps offers a simple and immediate solution. By replacing the 8 Gbps FC components with 16 Gbps FC on your all-flash HP 3PAR StoreServ array, FC switch and host FC HBAs, you can easily increase I/O bandwidth and IOPS by up to 35 percent and realize a 2.5X or better latency improvement, remaining significantly and consistently under a millisecond. Need proof? See the results from the Demartek Evaluation Report All-Flash HP 3PAR StoreServ 7450 Storage System and Generation 5 (Gen5) 16 Gbps FC. With older 4 Gbps FC infrastructure in its end-of-support life and 8 Gbps FC infrastructure starting to end-of-life, now is the time to evaluate 16 Gbps technology and the benefits it can bring your flash deployments.

Technical specifications

	HP 3PAR StoreServ 20850 All-flash	HP 3PAR StoreServ 20800 Converged flash
Controller nodes	2 or 4 or 6 or 8	2 or 4 or 6 or 8
Maximum total cache	3.6 TB	33.8 TB
Maximum on-node cache	3.6 TB	1.8 TB
Total flash cache	Not applicable	32 TB
Maximum number of HDDs	Not applicable	1920
Maximum number of SSDs	1024	1024
Maximum raw capacity	3.9 PiB all-flash	6 PiB (flash + HDDs)
16 Gbps FC host ports	0–160	0–160
10 Gbps iSCSI/FCoE ports	0–80	0–80
10 Gbps Ethernet ports for File Persona	0–32	0–32
Built-in 10 Gb RC ports	2–8	2–8

Software Suites for HP 3PAR StoreServ Storage

HP 3PAR Software Suite

Following are the different variants of HP 3PAR Software Suite:

HP 3PAR Operating System Software Suite	<p>Required for all new HP 3PAR StoreServ systems, this foundational software suite gives you everything you need to get up and running quickly and efficiently. Powered by HP 3PAR Gen5 Thin Express ASIC, HP 3PAR StoreServ's Thin Technologies which include HP 3PAR Thin Provisioning, HP 3PAR Thin Persistence, HP 3PAR Thin Conversion, HP 3PAR Thin Deduplication form the base of this software suite. Performance acceleration is assured by HP 3PAR Adaptive Flash Cache by reducing application response time.</p> <p>Simplified management is offered by HP 3PAR Operating System, HP 3PAR StoreServ Management Console, HP 3PAR Host Explorer, and HP SmartStart—software designed to get you off to a quick start with your new HP 3PAR StoreServ system; HP 3PAR System Reporter and HP 3PARInfo Software are designed to track performance and capacity utilization trends for multiple HP 3PAR StoreServ Systems. Other highlights of this suite include HP 3PAR Full Copy, autonomic rebalancing capabilities that help you optimize the use of future capacity expansions, and support for standard multi-pathing software for high availability in clustered environments. A one year license for online import is included to enable migration from HP EVA or EMC* or HDS¹ Storage systems.</p>
HP 3PAR Replication Suite	<p>This suite bundles HP 3PAR Virtual Copy with HP 3PAR Remote Copy Software, both also sold separately for all HP 3PAR StoreServ models. HP 3PAR Virtual Copy Software protects and shares data affordably with rapid recovery using reservation-less, non-duplicative, copy-on-write snapshots. HP 3PAR Remote Copy offers simple and cost effective data protection for efficient multi-tenant disaster recovery.</p> <p>Also, included in this bundle is Peer Persistence which ensures automatic transparent failover across data centers using Remote Copy Synchronous mode. For HP 3PAR StoreServ 20000 Storage system the Suite also includes Cluster Extension Software which enables automatic failover over distance using Remote Copy Asynchronous mode.</p>

Software suites for HP 3PAR StoreServ Storage (continued)

HP 3PAR Data Optimization Software Suite	This software bundle combines HP 3PAR Dynamic Optimization, HP 3PAR Adaptive Optimization, HP 3PAR Peer Motion, and HP 3PAR Priority Optimization Software together. HP 3PAR Dynamic Optimization delivers the required service levels for the lowest possible cost throughout the data lifecycle. HP 3PAR Adaptive Optimization improves storage utilization by enabling cost-optimized storage tiering. HP 3PAR Peer Motion enables load balancing at will wherein, movement of data and workloads between arrays is initiated without impacting applications, users or services. HP 3PAR Priority Optimization assures service levels with QoS controls for mission critical applications. The four software titles bundled in this suite are also sold separately for all HP 3PAR StoreServ models. Depending on purchase date, titles included in this suite may vary. Check the HP 3PAR Software QuickSpecs for complete details.
HP 3PAR File Persona Suite	This software suite enables file protocol services and an Object Access API to extend the spectrum of primary storage workloads natively addressed by HP 3PAR StoreServ Storage Systems with Converged Controllers. With this solution, the architectural benefits of HP 3PAR StoreServ Storage can be extended to the following use cases: home directory consolidation, group, departmental and corporate shares; and custom cloud applications.
HP 3PAR Security Suite	This software suite bundles HP 3PAR Virtual Domains and HP 3PAR Virtual Lock Software, both also sold separately for all HP 3PAR StoreServ models. With this suite, you can segregate access and deliver robust storage services for different applications and user groups with additional security attached to the retention of storage volumes.
HP 3PAR Application Software Suite for Hyper-V	Protect your Microsoft Hyper-V environment with HP 3PAR Recovery Manager for Microsoft Hyper-V and the HP 3PAR VSS Provider Software, included in this optional software.
HP 3PAR Application Software Suite for Exchange	This bundle gives you the essentials for use with Microsoft Exchange, including HP 3PAR Recovery Manager for Exchange and the VSS Provider Software.
HP 3PAR Application Software Suite for Oracle	Everything you need for protecting Oracle databases, including HP 3PAR Recovery Manager for Oracle and Oracle space reclamation capabilities
HP 3PAR Application Software Suite for SQL	Protect Microsoft SQL databases with HP 3PAR Recovery Manager for Microsoft SQL and the HP 3PAR VSS Provider Software
HP StoreOnce Recovery Central Manager	By combining the performance of snapshots with the protection of backups, this software integrates HP 3PAR StoreServ with HP 3PAR StoreOnce Backup Systems to provide a converged availability and flat backup service that augments traditional backup processes. With this automated, non-intrusive software, the simplicity and performance of snapshots can be combined with the reliability and cost effective retention of deduplicated backups.

* HP 3PAR Online Import support for EMC Storage extends to EMC VMAX, EMC VNX, EMC CLARiiON CX4 Storage systems.

† HP 3PAR Online Import support for Hitachi Storage systems extends to Hitachi Data Systems (HDS) TagmaStore Network Storage Controller (NSC), Universal Storage Platforms (USP), and Virtual Storage Platforms (VSP) Storage systems.

HP Technology Services

Customize your IT lifecycle management, from acquisition of new IT, management of existing assets, and removal of unneeded equipment. Visit hp.com/go/hpfinancialservices.

HP Factory Express provides customization and deployment services along with your storage and server purchases. You can customize hardware to your exact specifications in the factory—helpingspeed deployment. Visit hp.com/go/factoryexpress.

Gain the skills you need with ExpertOne training and certification from HP. With HP Converged Storage training, you will accelerate your technology transition, improve operational performance, and get the best return on your HP investment. Our training is available when and where you need it, through flexible delivery options and a global training capability. Visit hp.com/learn/storage.

Expert HP storage consultants and service professionals

We sit down with you and your team to map your storage needs. HP can not only help you accelerate implementation and reduce deployment risk, but also help you realize the full value of your storage purchases as you transform storage for the New Style of IT.

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.

Note: Specific service availability varies by product



Take five minutes to calculate the potential three-year cost savings and ROI you can expect by migrating from your current storage to an HP 3PAR StoreServ Storage solution. [Click here](#) to go to the HP Storage Quick ROI Calculator.

HP Foundation Care

System-level IT hardware and software support delivers flexible coverage window and response time for more choice and simplicity.

HP Proactive Care

Combined reactive and proactive services provide easy-to-purchase, cost-efficient system-level support coupled with personalized expert advice and products connected to HP to help prevent problems and reduce downtime.

HP Proactive Care Advanced

Builds and incorporates on Proactive Care and also gives customers personalized technical and operational advice from an assigned, local account support manager for personalized technical collaboration, flexible access to specialist skills to help optimize business-critical IT, and enhanced Critical Incident Management to help so the business is not affected if there is a system or device outage.

HP Datacenter Care

Get the support you need to deploy, operate, and evolve your data center environment to be hybrid-cloud ready with single-point-of-accountability for HP and others' product.

Get connected and get back to business—HP Storage Technology Services provide the path to get your HP Storage solutions and your business connected to HP. Once connected, our experts are able to scan your system and run health checks, then use that data to create personalized reports, and recommendations for actions to take to prevent problems and downtime.

To learn more, visit: hp.com/services/storage

¹Based on a 100 percent random read workload with a block size of 8K with RAID 5 protection and node local volume layout running on the all-flash HP 3PAR StoreServ 20850 Storage system.

²Based on HP internal comparative analysis comparing HP 3PAR StoreServ 20000 Storage with all-flash vs traditional high end hybrid storage.

³When configured with 3.84 TB cMLC SSDs and used with 3PAR compaction technologies, the HP 3PAR StoreServ 20800 brings usable capacity to over 15 petabytes.

⁴As compared to not using data compaction technologies. Based on a data compaction ratio of 4:1.

⁵Based on HP internal testing, using 3.84 TB cMLC SSDs. These drives, when used in conjunction with 3PAR compaction technologies, brings the cost of all-flash HP 3PAR StoreServ Storage arrays to less than \$1.50 USD per gigabyte of usable storage capacity.

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

⁷Based on HP internal testing using a random, 100 percent write workload with an 8K block size.

⁸See product specifications for details. All HP 3PAR flash drives are sold with 20 percent more capacity than other SSD drives.

⁹As compared to not using data compaction technologies. Based on a data compaction ratio of 4:1.

¹⁰Subject to qualification and compliance with the HP 3PAR Get Virtual Guarantee Program Terms and Conditions, which will be provided by your HP Sales or Channel Partner representative.

¹¹For details, see h20195.www2.hp.com/v2/GetDocument.aspx?docname=4AA4-4251ENW&doctype=datasheet&doclang=EN_US&searchquery=&cc=us&lc=en

¹²As compared to not using data compaction technologies. Based on a 4:1 data compaction ratio.

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