Brochure

Eliminate compromise

HP 3PAR StoreServ Storage—the only primary storage architecture you need

Flash-optimized, modern Tier-1 storage for the New Style of IT

IT has never been more important to doing business, which means that IT infrastructure must be simpler, smarter, faster, more flexible, and more business-aligned than ever. The world is moving rapidly towards a New Style of IT, and will leave behind any business that doesn't adapt even more rapidly. Is your storage infrastructure ready?

HP 3PAR StoreServ Storage provides the only primary storage architecture you need—regardless of whether you are a midsize enterprise experiencing rapid growth in your virtualized Microsoft® Exchange, Microsoft SQL, or Oracle Database environment, a large enterprise looking to support IT as a Service (ITaaS), or a global service provider building a hybrid or private cloud.

With a range of models that support true convergence of block and file protocols, bring Tier-1 data services to the midrange, deliver all-flash array performance for the cost of spinning disk, and provide mission-critical resiliency and Quality of Service (QoS), HP 3PAR StoreServ Storage has you covered.

Respond to any demand—effortlessly, without exception, and without compromise

Virtualization, cloud, and ITaaS are driving new requirements around storage agility and efficiency that are pushing legacy architectures to their brink. With a modern, scale-out architecture that is designed to meet these new demands, HP 3PAR StoreServ Storage is the only primary storage platform you need to respond to change with agility and efficiency.

Provision storage instantly. Serve unpredictable and mixed workloads while flexibly adapting to shifts in application service levels. Deploy flash for the cost of spinning media. Serve a broad spectrum of primary storage workloads including virtualization, databases, applications, home directory consolidation, and file shares. Manage block, file, and object access from a single interface. HP 3PAR StoreServ Storage lets you do all of this while driving up efficiency and resource utilization with hardware acceleration that optimizes performance and lowers your total cost of ownership.

Here is some of what you can do with HP 3PAR StoreServ Storage:

Consolidate with confidence onto a multi-tenant platform with six-nines availability
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.

With a modern architecture that provides true convergence of block, file, and object access while eliminating single points of failure, HP 3PAR StoreServ Storage delivers Tier-1 resilience paired with secure administrative segregation of users, hosts, and application data using virtual machine technology.

Full hardware redundancy paired with software features that perform error checking and seamless failover/failback ensure complete system resilience, even when the unexpected happens. Autonomic configuration prevents human error while remote diagnostics capabilities let you tap in to proactive monitoring and management to protect against unforeseen issues.

With the Get 6-Nines Guarantee, HP stands behind the ability of all quad-node and larger 3PAR StoreServ Storage systems to deliver data high availability with 99.9999 percent uptime, giving you all of the benefits of HP Converged Storage for your mission-critical environment without the risk.[1]

Deliver uncompromising QoS for even the 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.

[1] Contact HP for full terms and conditions.

System-wide striping of data assures high and predictable service levels for all workload types through the massively parallel and fine-grained striping of data across all internal resources (disks, ports, loops, cache, processors, etc.). As a result, as the use of the system grows—or in the event of a component failure—service conditions remain high and predictable. Unlike application-centric approaches to storage, one-click autonomic rebalancing on HP 3PAR StoreServ Storage enables you to optimize QoS levels without service disruption, preplanning, or the need to deploy separate arrays to support different service levels.

HP 3PAR Priority Optimization gives you the flexibility and control to prioritize your most mission-critical applications and workloads by specifying Service Level Objectives and Service Level Caps for IOPS/performance and bandwidth. You can also define latency goals for your most mission-critical applications. If these goals are not met, the system automatically adjusts the service levels of lower-priority applications and workloads in order to assure that necessary QoS levels for your highest priority applications are always met.
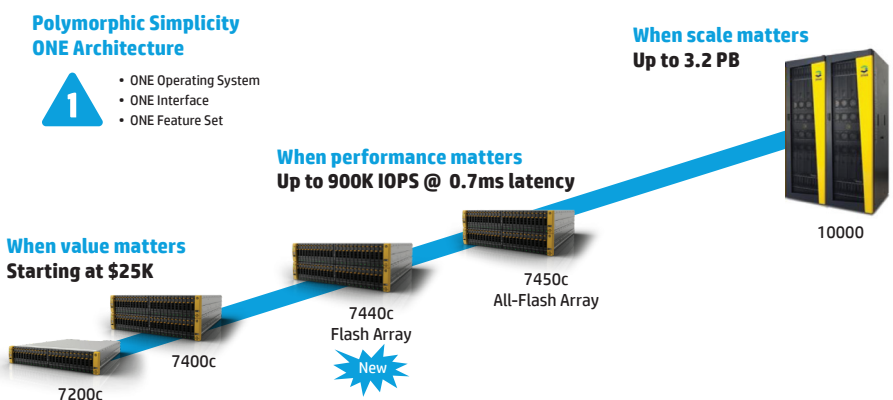
With the combination of HP 3PAR Priority Optimization and HP 3PAR Virtual Domains software, you can specify these thresholds to protect individual tenants as well, for example to prevent a single tenant from monopolizing array resources. This capability eliminates the last barrier to consolidation by allowing you to assure QoS levels without having to physically partition resources or maintain discreet storage silos.

Accelerate performance with a flash-optimized architecture featuring inline deduplication
Meet even the most stringent SLAs with performance acceleration for your most frequently accessed data. HP 3PAR StoreServ offers a flash-optimized architecture that makes innovative use of flash-based storage technologies to give you a choice between all-flash arrays, solid state storage tiered with spinning media, and the use of flash-based media to extend system cache.

A feature of the HP 3PAR OS, HP 3PAR Thin Deduplication software with patented Express Indexing is the only solution in the industry that delivers inline deduplication at scale with hardware acceleration for all-flash arrays. Thin Deduplication is also available on flash storage tiers on general-purpose arrays across the entire HP 3PAR StoreServ Storage family to increase usable capacity, lower total cost of ownership, and extend flash media lifespan. In cases where there is a large amount of duplicate data, Thin Deduplication also improves write throughput and performance. Other storage architectures that support deduplication are not able to offer these benefits at the same capacity scale or at the same performance level.

Figure 1. HP 3PAR StoreServ Storage Family

No other storage architecture offers this range of deployment options to provide you with a high degree of flexibility and adaptability as your needs change over time. Deliver the highest service levels at the lowest possible cost no matter what your deployment scenario is like or how it may change. Best of all, flash-based performance acceleration is delivered with all the system's Tier-1 data services and without compromising Tier-1 resiliency.

HP 3PAR Express Writes is a built-in HP 3PAR OS write acceleration feature that optimizes CPU utilization to increase throughput, deliver up to 30 percent more IOPS, and reduce latency by up to 20 percent depending on workload.[2] These benefits extend to both spinning drives and flash-based media. For read acceleration, is also built in to the HP 3PAR OS offers HP 3PAR Adaptive Flash Cache, a feature that allows SSDs to act as an extension of system cache. This feature

can as much as double read rates and reduce latency up to 70 percent with HP 3PAR StoreServ Storage arrays that are configured with SSDs. In addition, with optional HP 3PAR Dynamic Optimization software, you have the ability to convert both "fat" and "thin" virtual volumes to deduplicated volumes (and vice versa) in order to free up capacity on your array.

Meet a broad spectrum of workloads with true convergence of block and file
HP 3PAR StoreServ Storage systems with Converged Controllers support the optional HP 3PAR File Persona Software Suite to deliver a tightly integrated, converged solution for provisioning block storage volumes as well as file shares from a single converged system.[3] The HP 3PAR File Persona Software Suite is a licensed feature of the 3PAR OS that enables a rich set of file protocols, an Object Access API, and file services.

The HP 3PAR StoreServ File Persona software license unlocks capabilities built into the HP 3PAR OS and the Converged Controllers to enable home directory consolidation, file sharing, and custom cloud applications in addition to virtualization, database, and application workloads that use block protocols—all from truly Converged Controllers, truly agile capacity, and truly unified management. Purchasing this optional license lets you extend all of the architectural benefits that the platform already delivers for block workloads to file shares and object access in a way that is simple to integrate and administer. With this truly converged solution, you get up to 67%[4] data center space savings and significant power savings with a single converged solution that gives you agile provisioning of block, file, and object access. You also get seamless compaction of file data using the system's built-in zero-detection capabilities.

With the addition of HP 3PAR Adaptive Optimization and Dynamic Optimization software licenses to this solution, you can extend granular performance and capacity efficiency to your file shares in addition to your block workloads. By taking advantage of the Adaptive Flash Cache feature of the HP 3PAR OS, you can accelerate performance of read-intensive file data in addition to block workloads. This solution is ideal for ITaaS and hosting providers with customer-dedicated storage, small and medium sized businesses (SMBs) with central data centers, and enterprise branch and remote offices.

Cut capacity requirements by at least 50 percent, guaranteed
In addition to Thin Deduplication, HP 3PAR StoreServ Storage features other industry-leading thin technologies that reduce capacity requirements with a comprehensive approach to space efficiency that eliminates over-provisioning and uses fast and simple space reclamation. 3PAR ASICs in each storage controller not only deliver mixed workload support, but provide the high-performance engine behind unique thin technologies that allow you to purchase 50 percent less storage to meet your application requirements—without compromising performance or utilization.[5]

Respond 8x faster with autonomic management
Simplify, automate, and expedite management with storage that is self-configuring, self-provisioning, and self-optimizing. HP 3PAR StoreServ Storage eliminates traditional manual storage planning and change management with autonomic management and optimization features that are intelligent, take place at a subsystem level, and don't require administrator intervention. These features not only let you respond 8x faster than our main competitor by shrinking provisioning time from hours, weeks, and days to just seconds, but also minimize the opportunity for human error. Provision a volume in only 15 seconds. Deliver high performance to all applications, even under failure conditions. Quickly adapt to the unpredictable by optimizing QoS levels with one click.

Double virtual machine density, guaranteed
Get more out of your virtualization deployment. With HP 3PAR StoreServ Storage, you can double virtual machine density on your physical servers, backed by the HP Get Virtual Guarantee.[5] HP 3PAR StoreServ Storage is built to deliver performance that exceeds the demands of virtualized environments along with transformative levels of simplicity, agility, and efficiency. Integration with Microsoft System Center and VMware vCenter gives you enhanced visibility into storage while HP 3PAR Recovery Manager provides superior granularity and control of array-based snapshots. Integration of this solution 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 virtual machine consolidation with traditional storage.

Looking to grow? Save on the cost of a storage technology refresh and then maximize storage return on investment (ROI) over time by keeping incremental purchases, administration, and operating costs to a minimum.

Need a sure thing? 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.[5]

[2] Based on a random, 100 percent write workload with an 8K block size.
[3] Converged Controllers are a feature of models 7200c, 7400c, 7440c, and 7450c.
[4] HP internal analysis compared to EMC VNX, September 2014.
[5] Subject 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.

Want to maximize the benefit of deploying HP 3PAR StoreServ Storage to support your virtualized environment? HP Technical Services Storage Consulting now offers HP 3PAR StoreServ Integration Services to help you realize maximum benefit from your storage investments by integrating your new 3PAR storage solution into your existing server and SAN infrastructure. Learn more at **hp.com/services/storage**.

Looking to replace your EMC VMAX, CLARiiON CX4, or VNX array? Every HP 3PAR StoreServ Storage system comes with 3PAR Online Import Software for EMC at no charge for 180 days— giving you painless migration so you can finally say goodbye to the "Land of NO"!

Seamlessly refresh storage and maintain load balancing across arrays

HP 3PAR StoreServ Storage supports federated data mobility across Tier-1, midrange, and all-flash arrays so you can manage resources at the data center level rather than just the system level. Peer-based storage federation lets you move data and workloads between arrays without impact to applications, users, or services. Simply and non-disruptively shift data between any model HP 3PAR StoreServ Storage system without additional management layers or appliances. Map workloads to the right resources and establish tiers of storage across the data center for different SLAs. Improve data availability and protection in clustered VMware and Microsoft Hyper-V environments.

Painlessly migrate to Tier-1 storage built for cloud and ITaaS

Storage federation on HP 3PAR StoreServ Storage also makes modernization simple by eliminating data migration as a pain point in refreshing your primary storage—including upgrading from HP EVA Storage and EMC VMAX, CLARiiON CX4, and VNX arrays.

Upgrading from HP EVA Storage? Now you can effortlessly import data from HP EVA Storage to HP 3PAR StoreServ Storage for a simple upgrade path that will allow you to maintain much of your existing SAN infrastructure.

Looking to replace your legacy EMC array? Every HP 3PAR StoreServ Storage system comes with 3PAR Online Import Software for EMC, available at no charge for 180 days. With Online Import Software for EMC, it's now easier to replace your EMC array with HP 3PAR StoreServ Storage than to migrate your data onto the latest-generation EMC VMAX or VNX array.

Architecture that sets new standards for agility and efficiency

As IT evolves away from application-centric computing and towards more efficient and flexible service delivery models, infrastructure requirements are changing too. With a modern architecture built for virtualization, cloud, and ITaaS, HP 3PAR StoreServ Storage anticipates these new requirements with a resilient, secure, multi-tenant platform that lets you:

• Provision instantly

• Maximize provisioning agility with a single capacity group for block and file

• Serve diverse and unpredictable workloads

• Deliver sustainable performance

• Flexibly adapt to shifting business demands

• Drive up resource utilization across the data center

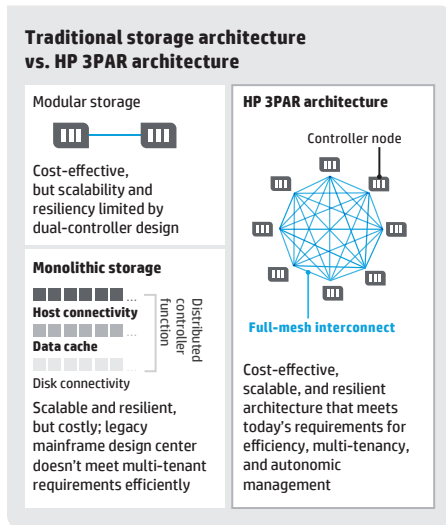• Drive down total cost of ownership for storage

A tightly clustered, multi-controller, scale-out architecture lets you grow into rather than out of your storage. Add new applications and workloads affordably and non-disruptively—all within a single, autonomically tiered, flash-optimized array with Converged Controllers to support file shares and object access in addition to block protocols.[3]

Flash-optimized architecture featuring a Mesh-Active design

HP 3PAR StoreServ Storage features a Mesh-Active design based on a unique system of controller interconnects as part of a flash-optimized architecture. This architecture combines the benefits of monolithic and modular architectures while eliminating price premiums, scaling complexities, and performance bottlenecks of legacy storage designs. As a result, the HP 3PAR architecture delivers sustainable performance for diverse and unpredictable workloads that scales even with extremely high levels of capacity utilization.

Unlike legacy "Active-Active" controller architectures—where each volume is active on only a single controller—the 3PAR Mesh-Active design, along with a storage virtualization strategy that uses three levels of abstraction allows each volume to be active on every controller in the system. This forms a Mesh-Active cluster that delivers robust, load-balanced performance and greater headroom for cost-effective scalability that overcomes the tradeoffs typically associated with modular and monolithic storage.

A high-speed, full-mesh interconnection joins multiple storage controllers to form a cache-coherent, Mesh-Active cluster optimized for low-latency, high-performance, inter-node communication. This Mesh-Active design is one of many features that make the HP 3PAR StoreServ Storage architecture "flash-optimized", eliminating the performance bottlenecks that can choke general-purpose disk arrays once flash-based media is introduced.

The controllers that form the system's tightly-coupled, cache-coherent, Mesh-Active cluster feature ASICs that use Direct Memory Access (DMA) to enable a local ASIC in one node to directly access memory in other nodes to reduce latency times. These ASICs also connect every controller in the system with every other controller in the system over dedicated, high-bandwidth, low-latency links, enabling I/O workloads to be spread widely across the array. HP 3PAR StoreServ Storage systems featuring Converged Controllers provide the industry's most efficient storage array, engineered for true convergence of block, file, and object access.[3]

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

Traditional storage architecture vs. HP 3PAR architecture

Modular storage

Cost-effective, but scalability and resiliency limited by dual-controller design

Monolithic storage

Host connectivity

Data cache

Disk connectivity

Distributed controller function

Scalable and resilient, but costly; legacy mainframe design center doesn't meet multi-tenant requirements efficiently

HP 3PAR architecture

Controller node

Full-mesh interconnect

Cost-effective, scalable, and resilient architecture that meets today's requirements for efficiency, multi-tenancy, and autonomic management

Media lifespan mechanisms extend flash storage investments

Within each storage controller, purpose-built ASICs provide an efficient, silicon-based, zero-detection mechanism that powers inline deduplication for block and file data compaction and the removal of allocated but unused space without impacting performance—thereby extending the life of flash-based media by avoiding unnecessary writes. Adaptive Read and Write is another feature that helps extend the life of flash drives by automatically matching host I/O size reads and writes.

3PAR Adaptive Sparing technology extends flash-based media endurance by adjusting the system's sparing approach to minimize impact on SSDs. While other architectures generally reserve entire drives to use as spares, in the 3PAR architecture, the system reserves spare chunklets within each drive. When using flash-based media, 3PAR Adaptive Sparing adjusts sparing policies on the fly to avoid using SSDs for sparing and therefore lengthen flash media lifespan and drive down the cost of flash performance.

3PAR innovations around flash such as Adaptive Sparing not only bring the effective cost of flash media down, but also enable HP to offer a five-year warranty on all HP 3PAR StoreServ SSDs. This warranty is available for all HP 3PAR StoreServ arrays that support SSDs, including the all-flash HP 3PAR StoreServ 7200 Starter Kit and StoreServ 7450 all-flash array and 3PAR StoreServ 7000-series and 10000-series arrays with all-flash and mixed drive configurations.

Mixed workload support for consistently high performance

Another major benefit of the system's ASICs is the support for mixed workloads with extremely high performance levels. Transaction- and throughput-intensive workloads run on the same storage resources without contention, enabling consolidation without compromise. This is particularly valuable in virtual server environments, where HP 3PAR StoreServ Storage allows you to double virtual machine density so you can increase server and storage consolidation and improve ROI.[5]

Multi-tenant I/O processing enables performance optimization for mixed workloads by breaking large I/O into 32 KB, sub-I/O chunklets to ensure small read I/Os don't get held up behind large I/O requests. With flash-based media, this granular approach ensures consistently high performance as you scale workloads to hundreds of thousands of IOPS and beyond.

The accelerated performance of the system's ASICs, combined with Rapid RAID Rebuild capabilities, also fuel the platform's Fast RAID 5 and Fast RAID 6 capabilities, which enable the system to achieve the performance of traditional RAID mirroring with up to 66 percent less storage capacity.[6]

Fine-grained virtualization and system-wide striping

The 3PAR StoreServ architecture uses three levels of storage virtualization to drive up capacity utilization and accelerate performance. This fine-grained virtualization divides each physical disk into granular allocation units, or chunklets, each of which can be independently assigned and dynamically reassigned to different logical disks that are used to create virtual volumes. Breaking media devices (disk- or flash-based) into chunklets virtualizes physical drives to enable higher utilization and avoid stranded capacity. This fine-grained virtualization unit also enables mixed RAID levels on the same physical drive, therefore doing away with dedicated RAID groups and seamlessly supporting new media technologies such as SSDs.

[6] According to the 3PAR Architecture technical white paper, HP 3PAR RAID MP (Multi-Parity) uses Fast RAID 6 and the accelerated performance of the HP 3PAR ASIC to prevent data loss as a result of double disk failures. Performance levels are maintained within 15 percent of RAID 10 and with capacity overheads comparable to popular RAID 5 modes.

Logical disks are the virtualization layer in which QoS parameters are applied such as availability level, drive media type, RAID level, etc. This enables sub-LUN tiering and the system-wide striping of data and I/O for each volume across all system resources. This system-wide striping delivers simultaneously high capacity utilization and performance levels. Even a small volume can leverage the performance of hundreds of media devices and all of the system's storage controllers for optimal performance without compromising capacity utilization.

For flash-based media, fine-grained virtualization combined with system-wide striping drives uniform I/O patterns by spreading wear evenly across the entire system. Should there be a media failure, system-wide sparing also helps guard against performance degradation by enabling many-to-many rebuild, resulting in faster rebuilds. Because HP 3PAR StoreServ Storage autonomically manages this system-wide load balancing, no extra time or complexity is required to create or maintain an optimally configured system.

Dynamic caching optimized for flash
Caching is an important element of the HP 3PAR StoreServ architecture, where it is performed dynamically and in a manner that optimizes flash-based media longevity. The 3PAR caching algorithm is dynamic in that it adapts itself to media type (HDD vs. SSD), drive type (15k rpm vs. 7.2k rpm), and workload type (random vs. sequential and read vs. write). In addition, features like Adaptive Read and Write enable a more granular caching approach when handling flash-based media by matching backend reads and writes to host I/O sizes. This avoids unnecessary access to data, thereby significantly reducing I/O latency, avoiding unnecessary flash media wear-out, and boosting backend performance.

To ensure consistent random I/O performance with flash media even under mixed workload conditions, the 3PAR StoreServ caching algorithm breaks down large sequential I/O into smaller blocks before sending them to the backend. Designed to serve unpredictable multi-tenant workloads, this caching algorithm also adjusts autonomically to changes in workload patterns. For example, Autonomic Cache Offload eliminates cache bottlenecks by automatically changing the frequency at which data is offloaded from cache to flash-based media using cache utilization rates.

Another important aspect of the cache offload algorithm is the determination of which cached data should be flushed to the backend. HP 3PAR StoreServ Storage keeps track of read cache hits and keeps "hot" data in cache itself, thereby lowering latencies of frequently accessed data. Most importantly, with HP 3PAR StoreServ Storage, you get all of these performance and latency advantages without having to introduce and support an entirely new flash-based storage architecture or silo into your IT environment.

Persistent technologies for Tier-1 resiliency
A major requirement of ITaaS is Tier-1 resiliency, which on HP 3PAR StoreServ Storage systems is delivered by hardware redundancy reinforced by persistent technologies that include Peer Persistence, Persistent Cache, and Persistent Ports.

HP 3PAR Peer Persistence software helps you keep your business-critical applications running seamlessly, even in the event of disaster, by enabling automated, transparent failover and failback, including between systems and sites. This transparency to hosts prevents disruption to the applications running on them so that your business isn't impacted.
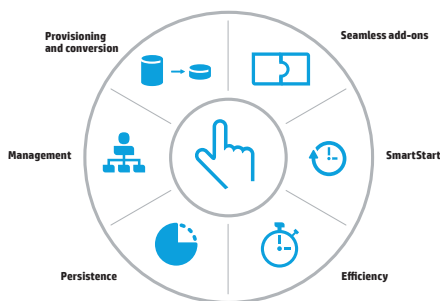
Certified for VMware vSphere Metro Storage Cluster (vMSC) and Microsoft Hyper-V, Peer Persistence can be deployed to enable peer federation for VMware or Windows® clusters to improve overall availability. It can also be used in conjunction with HP 3PAR Remote Copy software without the need for any additional hardware or appliance.

3PAR Persistent Cache removes performance impacts that result from unplanned component failures, making it a must-have for maintaining service levels in the virtual data center—a feature that you can't get from any other storage platform available for the midrange. This Tier-1 resiliency feature was designed to gracefully handle a controller failure by eliminating the performance penalties associated with "write-through" mode. A feature of all quad-node and larger HP 3PAR StoreServ arrays, 3PAR Persistent Cache leverages the platform's unique Mesh-Active design to preserve write caching by rapidly remirroring the cache to other nodes in the cluster in the event of a failure. And while you may not need this level of Tier-1 resiliency today

and may not choose to deploy a quad-node system to start, the grow-as-you-go capabilities of HP 3PAR StoreServ Storage mean that you won't need to rethink your storage strategy if and when your requirements change.

Standard on all HP StoreServ Storage models and unique to the platform, 3PAR Persistent Ports is another Tier-1 resiliency feature that supports high availability in virtualized environments. Persistent Ports automatically fails over a front-end controller port that experiences laser loss—for example, due to a cable or switch failure. The use of standard NPIV (N_Port ID Virtualization) technology enables a single host-facing 3PAR StoreServ port to assume the identity of additional predesignated partner ports, thus enabling transparent switchover of host path connections. Persistent Ports also provides non-disruptive online software upgrades on HP 3PAR StoreServ Storage without relying on multi-pathing software to initiate failover. This ensures that host paths remain online throughout the software upgrade process.

Figure 3. 3PAR Software Suites enhance the agility and efficiency of your infrastructure

HP 3PAR software and suites

HP 3PAR StoreServ Storage leads the industry in providing array management features that remove the layers of complexity typically weighing down storage administration and products that enhance visibility and control while eliminating costly, repetitive, and error-prone manual tasks.

Building on HP 3PAR Operating System software, HP offers a range of standalone software products and bundled software suites to enhance the agility and efficiency of your infrastructure and enable you to eliminate compromise.

Available software suites are as follows:

HP 3PAR Operating System Software Suite—Required for all new HP 3PAR StoreServ Storage systems, this foundational software suite gives you everything you need to get up and running quickly and efficiently. This suite includes the HP 3PAR Operating System, HP StoreServ Management Console, HP Host Explorer, and HP 3PAR SmartStart[7]—software designed to get you off to a quick start with your new HP 3PAR StoreServ Storage system. This suite also includes all of the platform's thin software offerings—Thin Provisioning, Thin Conversion, Thin Persistence, Thin Deduplication, and Thin Clones. The suite's other highlights include Full Copy and 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 180-day license for 3PAR Online Import is included to enable migration from EMC VMAX, CLARiiON CX4, and VNX arrays or HP EVA Storage.

HP 3PAR File Persona Software Suite—A feature of the HP 3PAR OS, this license 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, you can extend the architectural benefits of HP 3PAR StoreServ Storage to the following use cases: home directory consolidation; group, departmental, and corporate shares; and custom cloud applications.

HP 3PAR Replication Software Suite—This optional suite bundles Virtual Copy with Remote Copy, both of which are also sold separately for all HP 3PAR StoreServ Storage models. Included in this bundle is Peer Persistence, which enables peer federation for VMware and Windows clusters to improve overall availability. Licensed based on system capacity.

HP 3PAR Data Optimization Software Suite—This optional software bundle combines HP 3PAR Dynamic Optimization, Adaptive Optimization, Peer Motion, and Priority Optimization so you can maintain high and predictable application performance in mixed workload environments and move data and workloads between arrays without impacting applications, users, or services. Licensed based on system capacity, the four software titles bundled in this suite are also sold separately for all HP 3PAR StoreServ Storage models. Depending on purchase date, titles included in this suite may vary. Check the HP 3PAR software QuickSpecs for complete details.

[7] SmartStart is available for HP 3PAR StoreServ 7200, 7400, 7440 and 7450 models only.

HP 3PAR Security Software Suite—This optional suite bundles Virtual Domains and Virtual Lock, both of which are also sold separately for all HP 3PAR StoreServ models. With this suite, you can deliver secure, segregated access and robust storage services for different applications and user groups with additional security attached to the retention of storage volumes. Licensed based on system capacity.

HP 3PAR Application Software Suite for VMware—Everything you need to make your VMware environment more agile and efficient—including Recovery Manager for VMware, Host Explorer for VMware, VASA support, and three essential plug-ins: the VMware Site Replication Manager (SRM) Adapter, the 3PAR VAAI plug-in, and the 3PAR management plug-in for VMware vCenter. This suite is optional and licensed on a per-system basis.

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 suite and licensed on a per-system basis.

HP 3PAR Application Software Suite for Exchange—This bundle gives you the essentials for use with Microsoft Exchange, including Recovery Manager for Exchange and the Volume Shadow Copy Service VSS Provider software. This suite is optional and licensed on a per-system basis.

HP 3PAR Application Software Suite for Oracle—Everything you need for protecting Oracle databases, including Recovery Manager for Oracle and Oracle Space Reclamation capabilities, sold as an optional suite and licensed on a per-system basis.

HP 3PAR Application Software Suite for SQL—Protect Microsoft SQL databases with Recovery Manager for Microsoft SQL and the 3PAR VSS Provider software, bundled with this optional suite and licensed on a per-system basis.

HP 3PAR Reporting Software Suite—Enhance system visibility and reporting capabilities with this optional suite, which includes System Reporter for historical and performance capacity reporting, and the 3PARInfo application, licensed on a per-system basis.

Application-managed storage

HP invests in technologies and partnerships to support key strategic IT initiatives by working with partners such as VMware, Citrix®, Red Hat®, Oracle, Symantec, and Microsoft to develop integrated, platform-specific storage solutions that work with HP 3PAR StoreServ Storage. Want to maximize the benefit of HP 3PAR StoreServ Storage? HP Technical Services Storage Consulting now offers HP 3PAR StoreServ Integration Services to help you realize the maximum benefit from your storage investments by integrating your new 3PAR storage solution into your existing server and SAN infrastructure. Learn more at hp.com/services/storage.

Server and desktop virtualization
Exclusive virtualization and automation features built into HP 3PAR StoreServ Storage work with our software products and solutions to deliver unique benefits for VMware vSphere, VMware View, Microsoft Windows Server Hyper-V, Citrix XenServer, Red Hat Enterprise Virtualization (RHEV), and Oracle VM.

Through collaboration with VMware on its Virtual Volumes (VVols) storage architecture, all HP 3PAR StoreServ Storage now support simple, granular VM-level storage control, disaster recovery, and quality of service in VMware environments. HP and VMware partnered for over three years on the definition, development, and testing of the VVols specification, with VMware using HP 3PAR StoreServ as the Fibre Channel reference platform this new storage architecture.

Databases
Database performance and availability are so critical that many organizations apply generous capacity and management resources to maintain needed service levels. HP 3PAR StoreServ Storage removes these inefficiencies, eliminating tradeoffs between capacity utilization, efficiency, and performance. For example, with HP 3PAR Thin Persistence software and the new 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 Server.[8]

Email and communications

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 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,[9] you can recover email messages quickly, affordably, and from multiple points in time.

	Midrange systems		All-flash and flash arrays		High-end systems	
Description and usage	When value matters. The same features that the world's largest service providers get, in a platform that lets you start small and grow without disruptive upgrades.		When performance matters. Delivers the same set of rich, Tier-1 data services without introducing a new storage architecture to deliver extremely high performance and low latency.		When scale matters. Tier-1 resiliency and application prioritization enable massive consolidation of unpredictable mixed workloads and bulletproof QoS delivery.	
Model	7200c	7400c	7450c	7440c	10400	10800
Storage Controllers	2	2–4	2–4	2-4	2-4	2-8
Converged Controllers	YES	YES	YES	YES	NO	NO
Maximum host ports Fibre Channel 1 Gb iSCSI 10 Gb iSCSI	12 4–12 N/A 0–4	24 4–24 N/A 0–8	24 4–24 N/A 0–8	24 4–24 N/A 0–8	96 0–96 N/A 0–16	192 0–192 N/A 0–32
Maximum initiators per system	1,024	2,048	2,048	2,048	4,096	8,192
Drive types (mixable)	SAS (performance, nearline, SSDs)	SAS (performance, nearline, SSDs)	SAS SSDs	SAS (performance, nearline, SSDs)	Fibre Channel and SAS (performance, nearline, SSDs)	Fibre Channel and SAS (performance, nearline, SSDs)
Max Hard Disk Drives (HDDs)	8–240	8–480	N/A	8-960	16–960	16–1920
Max Solid State Drives (SSDs)	120	240	240	240	256	512
Maximum capacity raw (HDD/SSD)	500 TB/230 TB	1600 TB/460 TB	N/A /460 TB	2000 TB/460 TB	1.6 PB/236 TB	3.2 PB/471 TB

Looking for an all-flash array at the absolute lowest cost?

The HP 3PAR StoreServ 7200 All-Flash Starter Kit offers all-flash array performance—complete with software licensing and 10TB of usable capacity—for half the cost of competing solutions and without sacrificing scalability, rich data services, or federated data mobility.

What you get:

• HP 3PAR StoreServ 7200 Storage array configured with 3.5TB of raw capacity (480GB cMLC SSDs)

• More than 75,000 IOPS at sub-millisecond response times

• Performance scalability to 250,000 IOPS

• Capacity scalability to 690TB usable and 230TB raw

• Three years of Basic Care with HP Proactive Care 24x7 support

[8] These software titles are delivered via the HP 3PAR Application Software Suite for Oracle and the HP 3PAR Application Software Suite for SQL, respectively.

[9] This software title is delivered via the HP 3PAR Application Software Suite for Exchange.
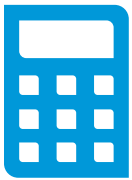
Bundled software:

- HP 3PAR OS, including HP 3PAR Thin Provisioning, Thin Conversion, Thin Persistence, Thin Deduplication, and Thin Clones software

- HP 3PAR Reporting Software Suite for enhanced system visibility and reporting

- HP 3PAR Virtual Copy for full thin-aware snapshot functionality

- 180-day license for 3PAR Online Import for simple and painless migration from EMC or HP EVA Storage arrays

Converged Data Protection with HP StoreOnce

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 and HP StoreOnce Recovery Manager Central for fast, efficient, reliable, and simple backup and recovery with your HP 3PAR StoreServ Storage system. 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.

HP Technology Services for 3PAR StoreServ Storage

HP 3PAR StoreServ Storage prepares your data center for what's next—whether that is server virtualization, the delivery of IT as a Service, cloud-based service delivery, or whatever your future may hold. Add to this HP 3PAR StoreServ Storage Service for a complete IT service solution that combines consulting, lifecycle events, and support.

Choose from a rich portfolio of services to make the most of HP Storage, so you can move with confidence to take full advantage of the broadest, most advanced portfolio in the industry.

Discover, plan, and design. Understand your options and build it right from day one:

- HP Storage Efficiency Analysis

- HP Storage Impact Analysis

- HP Modernization Service

Deploy and integrate. Increase uptime and decrease risk as you free up your resources:

- HP 3PAR StoreServ Storage Installation and Startup Service

- HP 3PAR Software Installation and Startup Service

- HP Storage Data Migration Service

- HP EVA to HP 3PAR StoreServ Acceleration Service

- HP Data Replication Solution Service

- HP Enhanced Implementation Service for SANs

- HP 3PAR Adaptive Optimization Policy Implementation Service

- HP Storage Virtual Volume Design and Implementation Service

- HP Proactive Select

- HP Thin Volume Conversion Service

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 solution. Click here to go to the HP Storage Quick ROI Tool.

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

Developing solutions for major social and environmental challenges hp.com/hpinfo/globalcitizenship

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—helping speed deployment. Visit hp.com/go/factoryexpress to learn more.

HP offers a variety of training courses on storage software, networking, archiving, and disk storage systems. Our classes are available in many delivery modalities—from traditional instructor-led courses at one of our 80 training centers worldwide to online and onsite training. Visit hp.com/learn/storage to learn more.

- HP 3PAR StoreServ Health Check
- HP Performance Analysis Service
- HP 3PAR Rebalance Service
- HP 3PAR StoreServ Replication Software Suite Installation and Startup Service
- HP 3PAR StoreServ Integration Service

Operate and support. Meet service-level agreements (SLAs) with the right support level. Choose from three levels of operate and support care:

- Optimized Care—With products connected to HP and proactive advice, delivers the highest levels of performance and stability through deployment and proactive management practices.

  Support: HP Critical Service

  Additional options: 10 HP Proactive Select credits per year, per array

- Standard Care—With products connected to HP and proactive advice, maintains high level of uptime, along with expert help to cut the cost and complexity of implementation and support.

  Support: HP Proactive Care 24x7, plus 20 HP Proactive Select credits per year, per array

  Additional options: HP Proactive Care Personalized Support (once per Proactive Care support new environment), an additional day of HP Personalized Support, and 10 additional

  HP Proactive Select credits per year, per array

- Basic Care—With products connected to HP and proactive service, minimum recommended support

  Support: HP Proactive Care 24x7, plus 10 HP Proactive Select credits per year, per array

  Additional options: HP Proactive Care Personalized Support (once per Proactive Care support new environment), an additional day of HP Personalized Support, and 10 additional

  HP Proactive Select credits per year, per array

If none of our support recommendations meet your needs, we can tailor a service solution for your unique support requirements. Only HP brings together deep expertise, proactive and business critical support and a strong partner network—plus a full set of infrastructure services designed to power a Converged Infrastructure.

For more information, visit: hp.com/services/storage

Learn more at
hp.com/go/StoreServ

Sign up for updates
hp.com/go/getupdated

Share with colleagues   Rate this document