Do more with less

The last storage architecture you will ever need
The same level of effortless, from midrange to high end, without compromise

It’s the last storage architecture you will ever need—regardless of whether your organization is a small or midsized business, a large global enterprise, or a service provider. With a range of models to meet the needs of small to large data centers running key business applications up through enterprise-wide deployment of mission-critical applications and beyond, HP 3PAR StoreServ Storage has you covered.

HP 3PAR StoreServ Storage offers the effortless performance and flexibility you need to accelerate new application deployment and support server virtualization, the delivery of IT as a Service (ITaaS), cloud-based service delivery models, or whatever your future may hold. Our storage lets you spend less time on management, gives you the advanced Tier 1 features in the industry for the lowest possible cost,¹ and eliminates tradeoffs like performance and scalability or performance and Tier 1 data services.

HP 3PAR StoreServ Storage lets you serve unpredictable and mixed workloads, support unstructured and structured data growth, meet your file and block storage needs today, and your object storage needs as they emerge. It’s the world’s most agile and efficient storage platform, here to help you master unpredictability—effortlessly, without exception, and without compromise.

Respond to any demand: double virtual machine density, guaranteed

Secure multi-tenancy

Consolidate with confidence. Achieve higher service levels for more users and applications with less infrastructure. HP 3PAR StoreServ Storage is designed to support massive consolidation by supporting high levels of performance with mixed workloads and secure administrative segregation of users, hosts, and application data. Deliver higher performance levels, greater availability, and next-generation functionality to multiple user groups and applications from a single storage system.

Storage federation

Meet the needs of today’s data center with the ability to 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 system without additional management layers or appliances. Map workloads to the right resources and establish tiers of storage across the data center for different service-level agreements (SLAs). Storage federation on HP 3PAR StoreServ Storage can also help you improve availability in clustered VMware environments.

Currently an HP EVA Storage customer? Effortlessly import your data from your current 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 using the Online Import feature, which leverages storage federation technologies.

Performance

With a flash-optimized architecture that delivers performance of over 550,000 IOPS at less than 0.7 ms latency,² and leadership in SPC-1³ benchmark results, HP 3PAR StoreServ Storage is the most powerful storage platform that spans from the midrange to the high end, accommodating both spinning and flash-based media.

A unique, clustered, Mesh-Active controller interconnection delivers performance that scales even with extremely high levels of capacity utilization. Low latency levels meet the requirements of response-time sensitive applications like Oracle Database and Microsoft® Exchange and allow you to get more out of your VMware deployment, where extensive use of virtual memory pages to disk can limit virtual machine consolidation on your physical servers when paired with legacy storage. By contrast, deploying HP 3PAR StoreServ Storage enables you to double virtual machine density on your physical servers—guaranteed.⁴

¹ HP internal competitive pricing and feature analysis of competitors with tracked market share using the following Tier 1 definition: Tier 1 storage has more than 2 independent controllers, 2 paths to back-end disk, graceful handling of controller failures without impacting service levels, sub-LUN tiering across HDDs and SSDs, and synchronized 3 way replication.
² 554,000 IOPS, 0.7 m/s latency, 100% Random Read, 4K blocks. Based on HP internal testing using public domain I/O subsystem measurement and characterization tools.
³ SPC-1 3PAR StoreServ 7400 Storage Results
⁴ The above is intended to highlight certain aspects of our Get Virtual Guarantee and does not contain the full terms, conditions, limitations, definitions, and other provisions (“Terms”) of the Get Virtual Guarantee. The Terms shall be contained in a written Get Virtual Guarantee Terms and Conditions, which shall take precedence over the above. Qualification for the Get Virtual Guarantee is subject to your acceptance of the Get Virtual Guarantee Terms and Conditions and your compliance with such Terms. A copy of the Get Virtual Guarantee Terms and Conditions will be provided to you by your sales representative.
Free up time for innovation: spend up to 90 percent less time on management

Autonomic storage

It’s like breathing: you don’t even have to think about it. Simplify, automate, and expedite storage management by handling storage provisioning, tiering, and change management autonomically—intelligently, at a subsystem level, and without administrator intervention.

Data center virtualization

HP 3PAR StoreServ Storage is built to deliver performance that exceeds the demands of virtualized data centers along with transformative levels of simplicity, agility, and efficiency. Integration with VMware vCenter and Microsoft System Center give you enhanced visibility into storage, and HP 3PAR Recovery Manager for VMware vCenter provides superior granularity and control of array-based snapshots. 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.

Spend less money on storage: cut capacity requirements in half

Get thin—guaranteed

HP 3PAR StoreServ Storage enables you to meet your performance and service level objectives with 50 to 75 percent fewer disks due to superior thin provisioning technologies and up to 90 percent less administration time. 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.

Looking for a sure thing? The HP Get Thin Guarantee promises new HP 3PAR StoreServ customers a minimum 50 percent reduction in capacity requirements by replacing their legacy storage—guaranteed.5

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5 The above is intended to highlight certain aspects of our Get Virtual Guarantee and does not contain the full terms, conditions, limitations, definitions, and other provisions (“Terms”) of the Get Virtual Guarantee. The Terms shall be contained in a written Get Virtual Guarantee Terms and Conditions, which shall take precedence over the above. Qualification for the Get Virtual Guarantee is subject to your acceptance of the Get Virtual Guarantee Terms and Conditions and your compliance with such Terms. A copy of the Get Virtual Guarantee Terms and Conditions will be provided to you by your sales representative.
**Figure 2.** Traditional storage architecture vs. HP 3PAR architecture

**Traditional storage architecture**

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

**Monolithic storage**

- Host connectivity
- Data cache
- Disk connectivity
- Scalable and resilient, but costly; legacy mainframe design centers
  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-tenant, and autonomic management

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**HP 3PAR StoreServ Architecture**

The tightly clustered, multi-tenant HP 3PAR StoreServ Architecture allows you to start small and grow as you go, adding new applications and workloads affordably and nondisruptively—all within a single, autonomically tiered, flash-optimized array.

**HP 3PAR ASIC with Thin Built In**

The HP 3PAR StoreServ ASIC features an efficient, silicon-based, zero-detection mechanism. This unique hardware capability gives HP 3PAR StoreServ Storage the power to remove allocated but unused space without impacting performance and extends the life of flash-based media by avoiding unnecessary writes. In order to get the most out of flash-based media, memory optimizations, including Direct Memory Access (DMA), have been made to the ASIC that enable a local ASIC in one controller node to directly access memory in other nodes to reduce latency times. The 3PAR StoreServ ASIC also supports mixed workloads with extremely high performance levels to alleviate legacy storage performance concerns and cut storage costs. Transaction- and throughput-intensive workloads run on the same storage resources without contention, thereby cutting capacity purchases in half. This ability 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.

The accelerated performance of the purpose-built ASIC, combined with Rapid RAID Rebuild capabilities, also fuels the platform’s Fast RAID 5 and Fast RAID 6 capabilities, which enable clients to achieve the performance of traditional RAID mirroring with up to 66 percent less storage capacity.

**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 that combines the benefits of monolithic and modular architectures while eliminating price premiums, scaling complexities, and performance bottlenecks (Figure 2). Unlike legacy “active-active” controller architectures—where each volume is active on only a single controller—this Mesh-Active design allows each volume to be active on every mesh controller in the system. As a result, it 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 controller nodes to form a cache-coherent, active-active cluster.

Another benefit of this Mesh-Active design is that it is one of many features that make HP 3PAR StoreServ Storage optimized for flash-based media. The Mesh-Active design eliminates the performance bottlenecks that can choke general-purpose disk arrays once flash-based media is introduced, arrays that were never designed to handle this class of high-performance media.

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**Green storage**

Do more with less. With HP 3PAR StoreServ Storage you can purchase up to 75 percent less capacity—meaning less equipment to house, fewer disks to power and cool, less hardware to down cycle after it has reached its end of life, and a reduced carbon footprint. The ability of the all-flash HP 3PAR StoreServ 7450 Storage system to deliver 5X more transactions per second on 90 percent fewer disks than an HDD configuration enables you to unlock up to 90% power savings and breathe new life into space- and power-strapped data centers.

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6 Based on HP internal IOMETER test results of like hardware configurations using 8K 100% Random Reads comparing an All-SSD HP 3PAR StoreServ 7450 vs. a market share leading midrange array.

7 The HP 3PAR Architecture technical white paper, June 2011. 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% of RAID 10 and with capacity overheads comparable to popular RAID 5 modes.
The platform also features new flash-optimized architectural innovations Autonomic Cache Offload, which eliminates cache bottlenecks by automatically changing the frequency at which data is offloaded from cache to flash media based on utilization rate. HP 3PAR Adaptive Read and Write automatically matches host I/O size reads and writes to flash media to avoid unnecessary data reads and writes and extend the life of flash-based media to control costs. 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 or stuck behind large I/O requests. This more granular approach to handling flash-based media ensures consistently high performance levels as you scale workloads to hundreds of thousands of IOPS. Best of all, with HP 3PAR StoreServ Storage, you get all of these advantages and Tier 1 data services without having to introduce and support an entirely new storage architecture or silo within your IT environment.

**Fine-grained virtualization and system-wide striping**

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 virtual volumes. This fine-grained virtualization unit means that a given media device (disk- or solid-state-based) can support hundreds of volumes and up to a dozen RAID definitions at the same time, allowing the system to make the most efficient use of physical assets.

Data and I/O for each volume are striped widely across all system resources (controllers, ports, cache, and drives). This system-wide striping is unique in the industry, and it enables the system to simultaneously deliver high-capacity utilization (no silos of any kind) and performance levels (all resources supporting each volume). Even a small volume can leverage the performance of hundreds of media devices and all the system’s controller nodes for optimal performance without compromising capacity utilization. For flash-based media, this drives uniform I/O patterns across all media resources by spreading wear evenly across the entire system. Should there be a media failure, system-wide sparing also helps against performance degradation by enabling many-to-many rebuild resulting in faster rebuilds. Because the system autonomically manages this system-wide load balancing, no extra time or complexity is required to create or maintain an optimally configured system.

**HP 3PAR Persistent Cache**

HP 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 component failures by eliminating the performance penalties associated with “write-through” mode. A feature of all quad-node and larger HP 3PAR StoreServ arrays, 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 circumstances change.

**HP 3PAR Persistent Ports**

HP 3PAR Persistent Ports is another Tier 1 resiliency feature that provides non-disruptive online software upgrades on HP 3PAR StoreServ Storage without relying on multipathing software to initiate failover. This feature, available on all HP 3PAR StoreServ models, brings Tier 1 resiliency across the 3PAR StoreServ product line, including midrange models, by helping to ensure that host paths remain online throughout the software upgrade process. 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.
HP 3PAR software

HP 3PAR StoreServ Storage leads the industry in providing array management features to remove the layers of complexity that typically weigh down storage administration. HP 3PAR StoreServ Storage delivers 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 do more with less.

Available HP 3PAR software suites

HP 3PAR StoreServ 7000, 7450, and 10000 Storage supports the same operating system and software offerings as the other members of the HP 3PAR StoreServ family, but with these specific 3PAR StoreServ models you have the opportunity to purchase software bundled into a series of suites designed to simplify purchasing. Select software titles may also be purchased separately.

- **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 Management Console, HP Host Explorer, and HP 3PAR SmartStart—software designed to get you off to a quick start with your new HP 3PAR StoreServ Storage system. It also includes all of the platform’s thin software offerings—Thin Provisioning, Thin Conversion, and Thin Persistence. 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 multipathing software for high availability in clustered environments. A 180-day license for Online Import is included to enable migration from HP EVA Storage.

- **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 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 achieve 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. For the 10000 models only, the HP 3PAR Optimization Suite is available and includes Adaptive Optimization and Dynamic Optimization.

- **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.

8SmartStart is available for HP 3PAR StoreServ 7200, 7400, and 7450 models only.
• **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 and the 3PARInfo application, licensed on a per-system basis.

**Operating system**

HP 3PAR Operating System software employs advanced internal virtualization to enhance administrative efficiency, system utilization, and storage performance. The HP 3PAR OS holds the key to simplifying storage management by handling provisioning and change management autonomically—intelligently, at a subsystem level, and without administrator intervention.

**Management console**

The HP 3PAR Management Console simplifies administration through a unified, point-and-click interface that supports all HP 3PAR software and provides uncommonly rich instrumentation for the physical and logical objects within all of your HP 3PAR StoreServ arrays. This rich instrumentation, combined with robust and customizable reporting capabilities, eliminates the need for add-on software tools and consulting services related to diagnosis and troubleshooting. Open administration support is provided via Simple Network Management Protocol (SNMP), Storage Management Initiative Specification (SMI-S), and a recently added Web Services API.

**Thin technologies**

HP 3PAR StoreServ offers unique software products that utilize the industry’s only Thin Built In hardware architecture\(^9\) that can be purchased bundled or separately:

• **HP 3PAR Thin Provisioning software**—Cuts SAN costs, floor space requirements, and energy expenses by up to 75 percent. No more dedicating resources for each application or service level. No more paying to power, house, and cool disks that you may never need.\(^10\)

• **HP 3PAR Thin Conversion software**—Leverages the Thin Built In ASIC to reduce up to 75 percent of your legacy capacity by allowing the simple, online, and rapid conversion of fully provisioned storage to thin provisioned storage.\(^11\)

• **HP 3PAR Thin Persistence software**—Reclaims space from deleted volumes so your storage stays thin over time. Allows space reclamation with VMware vSphere, Microsoft Windows\(^5\), and other applications via support for the standard SCSI UNMAP feature. Removes stranded capacity within Oracle databases by supporting the Oracle ASM Storage Reclamation Utility (ASRU). Also supports the Symantec Thin Reclamation API, which allows a host file system to intelligently communicate with the array to reclaim space associated with file deletions.

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\(^10\), \(^11\) *Forrester: The Total Economic Impact of HP 3PAR Storage, April 2012.*
Data protection and disaster recovery
The data protection and disaster recovery products available with HP 3PAR StoreServ Storage are based on uniquely flexible and efficient copy-on-write snapshot technology that helps you to affordably maximize both recovery point and recovery time objectives.

• **HP 3PAR Full Copy software**—Part of the HP 3PAR Operating System, this capability lets you create point-in-time clones with independent service-level parameters. Supports rapid resynchronization and is thin provisioning aware.

• **HP 3PAR Virtual Copy software**—A reservationless, non-duplicative, copy-on-write software product that allows you to protect and share data from any application. Capacity is never reserved up front, and changed data is never duplicated within the snapshot tree.

• **HP 3PAR Remote Copy software**—Protect and share data from any application more affordably. Dramatically reduce the cost of remote data replication and disaster recovery by leveraging thin copy technology, permitting the combination of midrange and high-end arrays, and reducing the need for professional services. Remote Copy features zero-detection capability that cuts initial synchronization bandwidth consumption by eliminating the need to transmit capacity that isn’t being used to hold actual data.

• **HP 3PAR Peer Persistence software**—Keep your business-critical applications seamlessly running even in the event of disaster. Federate storage across your data centers, unconstrained by their physical boundaries. HP 3PAR Peer Persistence software enables automated failover/failback between two sites/data centers to be transparent to hosts and without any disruption to applications running on them. Peer Persistence now comes with a VMware vSphere Metro Storage Cluster (vMSC) certification. It can be deployed with Remote Copy without the need for any additional hardware or appliance.

Data persistence, resilience, and security
HP 3PAR StoreServ Storage offers several data resilience and security products designed to work with its multi-tenant architecture to deliver the robust functionality demanded by Tier 1 storage, the cost structure attractiveness of Tier 2 storage, and the agility you expect from a highly virtualized infrastructure.

• **HP Priority Optimization software**—Allows administrators to assure (or guarantee) service levels because they can specifically offer predictable performance to an application or workload, protecting their mission-critical applications and deploying performance caps for those applications and workloads where service levels are not as critical.

• **HP 3PAR Virtual Domains software**—Delivers secure, segregated access and robust storage services for different applications and user groups. Supports increased storage service levels (performance, availability, and functionality).

• **HP 3PAR Virtual Lock software**—Enables the secure retention of storage volumes. Provides an efficient approach to data governance and legal discovery processes when used in conjunction with reservationless, non-duplicative snapshots.

Data mobility
Meet the needs of today’s data center with the ability to move data and workloads between arrays to balance cost and performance without impact to applications, users, or services while increasing business agility and minimizing risk.

• **HP 3PAR Adaptive Optimization software**—Leverages a proven, fine-grained data movement engine, and applies it to independent regions within a volume. The result is policy-driven, highly reliable, non-disruptive, autonomic tiered storage that delivers the right quality of service (QoS) to the right data at the right time so you can meet service-level targets for up to 30 percent less.\(^{12}\)

• **HP 3PAR Dynamic Optimization software**—Redistributes application volumes non-disruptively across tiers so you can realign application requirements with data QoS levels on demand. Analyzes how volumes use physical disks and automatically makes intelligent, non-disruptive adjustments to help ensure optimal volume performance and capacity utilization.

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\(^{12}\) [Assessment of Automated Tiered Storage for Midrange Arrays](https://www.wikibon.org/assess-automated-tiered-storage-midrange_arrays) “By allowing data to be migrated down according to actual usage, data can be optimally placed in the storage hierarchy, and less SSD and high-performance disk (SAS or FC) is required. Wikibon has found a range of savings from 15% to 30%, depending on how aggressive the implementation.”
• **HP 3PAR Peer Motion software**—Delivers storage federation by enabling data and workloads to be simply and non-disruptively moved between any model HP 3PAR StoreServ Storage system without impact to applications, users, or services. You can load balance I/O workloads across systems at will, perform technology update seamlessly, reduce costs for asset lifecycle management, and lower CAPEX associated with technology refresh.

• **HP 3PAR Online Import**—Upgrades your HP EVA Storage system to an HP 3PAR StoreServ Storage system simply with orchestration from EVA Command View. HP 3PAR Peer Motion is the fundamental technology that enables this capability.

**Autonomic provisioning**

HP 3PAR StoreServ Storage is designed to handle volume provisioning and change management autonomically—intelligently, granularly, and without administrator intervention. Accordingly, the following software capabilities are included in the HP 3PAR Operating System:

• **HP 3PAR Autonomic Groups software**—Enables you to create host, volume, and domain groups to automate and expedite storage provisioning. With Autonomic Groups, three clicks and 60 seconds are all you need to fully create and provision multiple volumes to multiple servers.

• **HP 3PAR Rapid Provisioning software**—Eliminates array planning by delivering instant provisioning through the fine-grained virtualization of lower-level components. Provisioning is managed intelligently and autonomically. The striping of data across internal resources provides high and predictable service levels for all workload types.

**Autonomic management**

With HP 3PAR StoreServ Storage, host-based software products reduce manual administration by offering autonomic performance and capacity utilization monitoring and establishing secure, autonomic communication channels between storage and hosts.

• **HP 3PAR System Reporter software**—A simple-to-use, Web-based performance and capacity management tool that aggregates historical system data for one or more HP 3PAR StoreServ Storage systems. Ideal for troubleshooting, planning, consolidated monitoring, and collecting information required for SLA and chargeback support.

• **HP 3PAR Host Explorer software**—Automates host discovery and collection of detailed host configuration information to speed provisioning and simplify maintenance. Securely communicates host information such as Fibre Channel World Wide Name (WWN) and host multi-path data to the system to reduce manual administration.

**Application-managed storage**

HP invests in technologies and partnerships to support key strategic IT initiatives, 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.

**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.

These benefits help you increase virtualization ROI, enabling you to consolidate by purchasing 50 percent fewer physical servers, simplify by spending 90 percent less time managing your virtual data center, and save by cutting storage capacity requirements by 50 percent or more.
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.13

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,14 you can recover email messages quickly, affordably, and from multiple points in time.

HP 3PAR StoreServ Storage components

Controller nodes
• The building blocks of the system’s unique Mesh-Active architecture
• Controller-independent instance of HP 3PAR OS for hardware and software fault tolerance
• Online-configurable adapter cards for host connectivity (Fibre Channel and iSCSI)15
• Built-in Gigabit Ethernet ports for Remote Copy
• HP 3PAR ASIC-assisted RAID XOR calculations
• HP 3PAR ASICs with Thin Build In for inline, non-disruptive capacity optimization
• Unique mixed workload support for simultaneously high transaction- and throughput-intensive performance

Full-mesh backplane
• High-speed, full-mesh, interconnection that joins multiple controller nodes
• Cache-coherent, Mesh-Active cluster
• Low-latency interconnect allows for tight coordination and simplified software model

Drive chassis
• Switched architecture for advanced error isolation
• Industry-leading density
• Redundant, hot-pluggable components
• Redundant paths to controller nodes

Drives and magazines
• Hot-pluggable magazines available for Fibre Channel, nearline (enterprise SATA), and solid-state drives (SSDs)
• Drives for 3PAR StoreServ models are sold individually, with a choice of: SAS Performance, SAS Nearline, SAS Self-Encrypting, and SAS Self-Encrypting SSDs

13 These software titles are delivered via the HP 3PAR Application Software Suite for Oracle and the HP 3PAR Application Software Suite for SQL, respectively.
14 This software title is delivered via the HP 3PAR Application Software Suite for Exchange.
15 Adding or changing an HP 3PAR StoreServ 7000 and 7450 model series controller adapter card requires the node go offline; however, the other node(s) in the system stay online making the HBA card change transparent to the hosts.
<table>
<thead>
<tr>
<th>HP 3PAR StoreServ 7000</th>
<th>HP 3PAR StoreServ 7450</th>
<th>HP 3PAR StoreServ 10000</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description and usage</strong></td>
<td>All-flash array storage designed for applications requiring extremely high performance and low latency; Delivers the same set of rich Tier 1 data services without introducing a new storage architecture</td>
<td>Tier 1 storage for virtual and cloud data centers that support the delivery of ITaaS, designed for consolidation of thousands of VM and to help ensure that applications never lose access to data</td>
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<td><strong>HP 3PAR ASIC</strong></td>
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</tr>
</tbody>
</table>

**HP Factory Express**

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. [hp.com/go/factoryexpress](http://hp.com/go/factoryexpress)

**Customer Technical Training**

We offer 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](http://hp.com/learn/storage).

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16, 17 SAS SSD drives are not available at this time
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 models, or whatever your future may hold. Add to that HP 3PAR StoreServ Storage Service for a complete IT service solution that combines consulting, lifecycle events, and support.

Choose from three levels of operate and support care:

**Optimized Care**
For mission-critical environments demanding the best performance and stability
- Support—HP Critical Service
- Additional options—10 HP Proactive Select credits per year, per array

**Standard Care**
For business-critical environments that need to maintain the highest level of uptime
- 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**
For the minimum recommended 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

Turn to HP Technology Services—the know-how to make technology work for you

To stay competitive and capitalize on new revenue opportunities, you must learn how to access technology in new ways. HP Technology Services understands that to drive your business forward, you need collaborative, passionate partners to help develop and execute solutions that take full advantage of your technology. We believe that our approach, people, and processes will help you deliver business value from IT. As storage and other technology innovations continue to expand your business with new opportunities, we respond to capitalize on it. So you will solve your most pressing challenges—and always be ready for what’s next.

Learn more at [hp.com/go/StoreServ](http://hp.com/go/StoreServ)