Data sheet

HP 3PAR StoreServ 10000 Storage

Raising the bar

Key features and benefits

Simplify and automate storage management with QoS

- Rapid, autonomic provisioning capabilities for non-disruptive optimization
- Autonomic service-level optimization through sub-volume tiering
- Open administration support through SMI-S, Web Services API, and OpenStack
- Integration with HP Converged Systems for additional management orchestration

Massive Consolidation of unpredictable mixed workloads

- Double VM density with a flash-optimized architecture
- Securely support multiple tenants from a single array with a Mesh-Active Cluster
- Eliminate chance of downtime with Tier 1 resiliency through a suite of Persistent technologies
- Flexible and efficient replication for multisite disaster recovery
- Assure service levels for critical applications with QoS
- Protect against unauthorized access to data with Data-at-Rest Encryption solutions

Optimize storage across systems and sites

- Half storage requirements with hardware enabled thin technologies without compromising performance
- One architecture and single stack across Tier 1, midrange, and flash-optimized systems
- Move data seamlessly to balance performance and cost across your data center

In-line Zero Block Deduplication

- Improve performance and extend media endurance by automatically detecting zero-pages inline and updating metadata table without writing to SSDs
- Reduce expensive replication bandwidth by automatically detecting zero pages
- Increase storage efficiency across arrays by automatically detecting zeros with Peer Motion

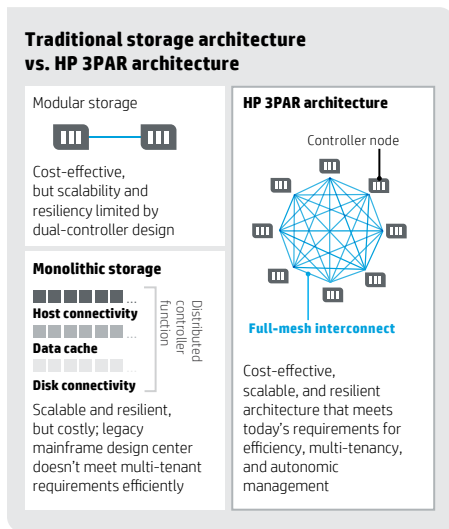## Platinum standard for Modern Tier 1 Storage

Have Cloud and IT as a Service (ITaaS) environments forced you to settle for Tier 1 storage that compromise agility and efficiency? Does your business suffer when storage can't scale to meet the needs of a cloud-based service delivery, or application performance can't keep up with demand, or complex disaster recovery can't eliminate the chance of downtime?

HP 3PAR StoreServ Storage is the platinum standard for Tier 1 storage to meet the need of hybrid and private cloud and ITaaS environments delivering autonomic, efficient, multi-tenant, and federated storage. Achieve unparalleled availability with the same trusted and proven architecture chosen by 3 out of 4 of the world's largest managed service providers (MSPs). Double VM density on your physical servers through a flash-optimized architecture designed to deliver the necessary I/O performance and workload agility to remove storage as a bottleneck in virtualized environments. Reduce administration by 90 percent with self-configuring, self-provisioning, and self-optimized automation.

HP 3PAR StoreServ 10000 Storage features a tightly coupled, clustered Mesh-Active architecture, secure multi-tenancy, and mixed workload support to fuel Modern IT and Cloud environments (figure 1). You'll get on-the-fly storage optimization to maximize capacity utilization while delivering high service levels. You'll get assured Quality of Service (QoS) levels to an application, workload, or tenant without having to physically partition resources. You get unique thin technologies to reduce acquisition and operational costs by up to 50 percent guaranteed.[1] You'll be able to dramatically reduce the cost and complexity of a disaster recovery program with highly efficient replication, set up and tested in minutes, across any HP 3PAR StoreServ model. You'll get an array built from the ground up to enable agile and efficient response to the changing business needs present in today's most demanding data centers.

The HP 3PAR Operating System Suite that comes with HP 3PAR StoreServ 10000 Storage includes everything you need to get started, including HP 3PAR Thin Technologies. Optional software suites are also available offering unmatched Tier 1 services including advanced data optimization, replication, security, reporting, and application integration. It's storage that delivers resilience to eliminate chance of downtime, scalability to ensure investment protection, and performance to support stringent Service-Level Agreements (SLAs) tied to multiple dynamic application and workloads.

**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

Managing storage shouldn't require dedicated experts

Gone are the days of employing armies of specialists who did capacity planning and implementation. Server virtualization, ITaaS, and cloud-based service delivery models have made for extremely active, unpredictable, and variable demands upon storage. You need a Modern Tier 1 Storage infrastructure that can scale to petabyte levels with dynamic provisioning tools and automated QoS software to manage things for you.

The HP 3PAR Operating Systems helps simplify, automate, and expedite storage management by handling provisioning, tiering, and change management without administrator intervention. HP 3PAR StoreServ automatically constructs volumes intelligently, based on available resources. This stands in contrast to manual provisioning approaches that require planning and manual addition of capacity to intermediary pools. HP 3PAR StoreServ eliminates the learning curve and slashes storage management overhead.

Provisioning is managed intelligently and autonomically. Massively parallel and fine-grained striping of data across internal resources assures high and predictable service levels for all workload types. Service conditions remain high and predictable even as use of the system grows or in the event of a component failure while traditional storage planning, change management, and array-specific professional services are eliminated.

HP 3PAR Operating System automatically creates a balanced system layout by mapping virtual volumes to many logical disks, and creating logical disks from chunklets drawn from many physical disks. As new hardware, Drives, Cages, and Nodes are added to a system the existing data can be laid out to use the new components and benefits from additional system wide-striping.

Policy-driven, autonomic storage tiering technologies balance cost and performance to meet service-level requirements for the lowest cost, while increasing business agility and mitigating risk. For example, HP 3PAR Adaptive Optimization software leverages a proven, fine-grained data movement engine and applies it to independent regions within a volume to deliver highly reliable, nondisruptive, autonomic-tiered storage to provide the right QoS to the right data at the right time so you can meet service level targets.

Lower costs and meet today's demanding Tier 1 requirements

Industry-leading thin technologies reduce capacity requirements with HP 3PAR StoreServ 10000 Storage by eliminating over-provisioning and providing fast and simple space reclamation. HP 3PAR Gen4 ASICs in each controller node not only deliver mixed workload support, but provide the high-performance engine behind the system's unique thin technologies, allowing you to purchase 50 percent less storage to meet your application requirements—without compromising performance or utilization. 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.[2]

Consolidate with confidence with Tier 1 resiliency

In order to meet service level demands for Modern IT and Cloud environments, high availability and uncompromising data protection are must-haves. With HP 3PAR StoreServ 10000 Storage, you can eliminate the chance of downtime while dramatically reducing the cost of remote data replication and disaster recovery (DR) with highly efficient, multisite, and multimode replication across any HP 3PAR StoreServ models.

HP 3PAR Remote Copy software allows you to achieve low recovery-time objectives (RTOs) and zero-data-loss recovery-point objectives (RPOs) with complete distance flexibility. And since HP 3PAR Remote Copy configuration is autonomic, it can be set up and tested in minutes reducing the need for professional services.

A unique set of data resilience and security products power 3PAR StoreServ 10000 Storage in delivering high availability and Tier 1 resilience to Cloud and ITaaS in multi-tenant environments. HP 3PAR Persistent Cache preserves service levels, so they are not impacted by unplanned component failures—a key requirement for the virtual data center. HP 3PAR Persistent Ports allows non-disruptive upgrades to HP 3PAR StoreServ 10000 Storage systems without relying on multipathing software and without initiating failover and now automatically fails over a front-end controller node port that experiences physical connection loss such as a cable or switch failure.

Modern Tier 1 resilience is delivered by HP 3PAR Peer Persistence software, which now comes with a VMware vSphere Metro Storage Cluster (vMSC) certification. With Peer Persistence, you'll also be able to 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.

A flash-optimized architecture enables optimal performance of flash-based SSDs while block-level storage tiering and mixed workload optimization enable high levels of performance for both spinning and non-spinning media, so you can put more applications on the same storage to lower total infrastructure cost. Unlike traditional arrays that require you to "scale up" to support growth or increase performance, the platform's clustered, Mesh-Active design, with fine-grained virtualization and system-wide striping, delivers capacity and performance that scales up to 3.2 PB even at extremely high capacity utilization levels.

Achieve higher service levels for more users and applications with less infrastructure. When combined with Tier 1 resiliency, the multicontroller 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, etc.) so that, 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 3PAR StoreServ Storage enables you to optimize QoS levels without service disruption, pre-planning, or the need to purchase separate arrays to support different service levels.

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: Multimode, multisite replication supported between high-end and mid-range arrays, keeping costs down	✓	✗
Capacity efficiency: "Thin provisioning-aware" replication cuts capacity purchases in half or more	✓	✗
Any-to-any native replication: Flexibly mirror data between any HP 3PAR StoreServ model and varying service level (RAID level, drive type, etc.)	✓	✗

HP 3PAR Virtual Domains software allows you to securely partition resources within a shared infrastructure to separate users and hosts to allow secure, shared storage. HP 3PAR Priority Optimization allows you to deliver assured QoS levels without having to physically partition resources by giving you the flexibility and control to prioritize your most mission-critical applications and workloads by specifying minimum thresholds for IOPs (i.e., performance), bandwidth, and latency (i.e., application response time). When these minimum thresholds are reached, 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 can be maintained. With the combination of Priority Optimization and Virtual Domains, you can specify these minimum thresholds to protect individual tenants as well. This feature also prevents a single tenant from monopolizing resources.
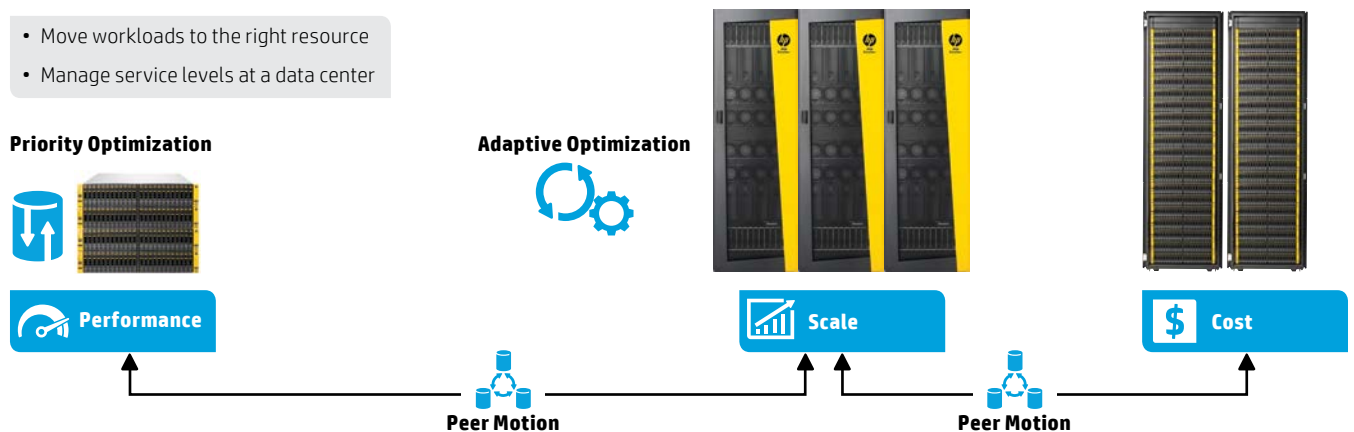
The HP 3PAR StoreServ Data at Rest Encryption solution protects data from both internal and external security breaches. If your application or environment requires protection from unauthorized access of the data on a drive, then consider the HP 3PAR StoreServ Data at Rest Encryption solution. HP 3PAR StoreServ models are available with self-encrypting drives (SEDs), where data is encrypted as it is written to the drive. You get the peace of mind in knowing that all data contained on these drives is protected against unauthorized access, regardless of hardware theft, drive failure, or drive retirement.

Balancing cost and performance without compromising Tier 1 requirements

Modern Tier 1 environments with virtualization, flexible business needs, and all sorts of clouds have made for extremely active, unpredictable, and variable demands upon storage. In order for your storage infrastructure to flex and adapt accordingly, you need to simply and efficiently move data and workloads between arrays without impact to your applications, users, or services. With HP 3PAR StoreServ 10000 Storage, you can simply and non-disruptively shift data between any HP 3PAR StoreServ systems without additional management layers or appliances. The underlying storage federation capabilities that make this seamless data movement possible can also help improve availability in clustered VMware environments.

Map workloads to the right resources and establish tiers of storage across the data center for different SLAs (figure 2). Lower costs and manage capacity at a data center level by thinly provisioning volumes with the freedom to move data between systems. Refresh technology effortlessly by streamlining the movement of volumes from older systems and non-disruptively update storage without application impact.

Figure 2. Data mobility to manage SLAs at a data center level

- Move workloads to the right resource
- Manage service levels at a data center

Priority Optimization

Adaptive Optimization

Performance

Scale

Cost

Peer Motion

Peer Motion

Storage customized for your application

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 10000 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 the demands of virtualized environments 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. 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 on 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, backed by the HP Get Virtual Guarantee.

Database performance and availability are so critical that many organizations apply generous capacity and management resources to maintain needed service levels. HP 3PAR StoreServ 10000 Storage removes these inefficiencies, eliminating tradeoffs between capacity utilization, efficiency, and performance. For example, with HP 3PAR Thin Persistence software and the 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.

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.

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 10000 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.

Technical specifications

	HP 3PAR StoreServ 10400	HP 3PAR StoreServ 10800
Drive description	SFF SAS LFF Fibre Channel/SATA/SAS/Nearline SAS/SSD	
Drive type	400 GB SFF SAS MLC SSD 300 GB 15k LFF FC 600 GB 15k LFF FC 300 GB 15k SFF SAS 450 GB 10k SFF SAS 900 GB 10k SFF SAS 2 TB 7.2k LFF SAS 4 TB 7.2k LFF SAS (960) maximum supported	400 GB SFF SAS MLC SSD 300 GB 15k LFF FC 600 GB 15k LFF FC 300 GB 15k SFF SAS 450 GB 10k SFF SAS 900 GB 10k SFF SAS 2 TB 7.2k LFF SAS 4 TB 7.2k LFF SAS (1920) maximum supported
Capacity	1.6 PB	3.2 PB
Host interface	8 Gb/s Fibre Channel (96) ports; or 10 Gb/s iSCSI (16) ports, and 8 Gb/s Fibre Channel (80) ports	8 Gb/s Fibre Channel (192) ports; or 10 Gb/s iSCSI (32) ports, and 8 Gb/s Fibre Channel (160) ports
Type and number of disk enclosures	(24) HP 3PAR StoreServ 40-drive chassis	(48) HP 3PAR StoreServ 40-drive chassis
Drives per enclosure	40	40
Cache	32 GB control and 64 GB data included per node	32 GB control and 64 GB data included per node
Storage controllers	Up to four 10400 quad-core 2.8 GHz Controller Nodes	Up to eight 10800 quad-core 2.8 GHz Controller Nodes
Warranty (parts-labor-onsite)	3/3/3	3/3/3

Software suites for HP 3PAR StoreServ Storage

HP 3PAR StoreServ Storage supports the same operating system and software offerings as the other members of the HP 3PAR StoreServ family. As with all HP 3PAR StoreServ Storage systems, you have the opportunity to purchase software bundled into a series of suites designed to simplify purchasing and save you money. Selected software titles may also be purchased separately, as indicated below.

HP 3PAR Operating System Software Suite	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. This suite includes the HP 3PAR Operating System, HP 3PAR Management Console, and HP 3PAR Host Explorer—software designed to get you off to a quick start with your new HP 3PAR StoreServ system. It also includes all of the platform's thin software offerings— HP 3PAR Thin Provisioning, HP 3PAR Thin Conversion, and HP 3PAR Thin Persistence. Other highlights of this suite include HP 3PAR Full Copy, autonomic rebalancing capabilities that help you get optimal use out 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 HP 3PAR Virtual Copy with HP 3PAR Remote Copy software, both also sold separately for all HP 3PAR StoreServ 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, HP 3PAR Adaptive Optimization, HP 3PAR Peer Motion, and HP 3PAR Priority Optimization software so you can 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 models. Depending on purchase date, titles included in this suite may vary. Check the HP 3PAR Software QuickSpec for complete details. For the 10000 models only, the HP 3PAR Optimization Suite is available and includes Adaptive Optimization and Dynamic Optimization.

Software suites for HP 3PAR StoreServ Storage (continued)

HP 3PAR Security Software Suite	This optional 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. 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 HP 3PAR Recovery Manager for VMware, Host Explorer for VMware, vSphere APIs for Storage Awareness (VASA) support, and three essential plug-ins: the VMware Site Replication Manager (SRM) Adapter, the HP 3PAR VAAI Plug-in, and the HP 3PAR Management Plug-in for VMware View. 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 HP 3PAR Recovery Manager for Exchange and the 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 HP 3PAR 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 HP 3PAR Recovery Manager for Microsoft SQL and the HP 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 HP 3PAR System Reporter software and the HP 3PARinfo application, licensed on a per-system basis.

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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.

Customer technical training

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.

HP Technology Services for HP 3PAR StoreServ Storage

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 Backup Recovery Efficiency Analysis

• HP Backup Recovery Impact Analysis

• HP Backup Recovery Modernization

• HP Storage Cloud Design 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 Calculator.

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 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 Thin Volume Conversion Service

• HP 3PAR StoreServ Health Check

• HP Performance Analysis Service

• HP 3PAR Rebalance Service

• HP 3PAR Storage Assessment Service

• HP Proactive Select

• HP 3PAR StoreServ Replication Software Suite Installation and Startup 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—delivers the highest levels of performance and stability through deployment and proactive management practices
HP Critical Service
Additional options: 10 HP Proactive Select credits per year, per array

• Standard Care—maintains a high level of uptime, along with expert help to cut the cost and complexity of implementation and support:
HP Proactive Care 24x7—plus, 20 credits per year, per array
Additional options: HP Proactive Care Personalized Support (once per each new Proactive Care support environment), HP Personalized Support Additional Day, and an additional 10 HP Proactive Select credits per year, per array

• Basic Care—minimum recommended support:
Proactive Care 24x7—plus, 10 credits per year, per array
Additional options: 10 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.

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