Hewlett Packard Enterprise

HPE 3PAR Priority Optimization software

Manage service level performance as business requirements dictate and protect applications and tenants from unpredictable bursts of I/O.

HPE 3PAR Priority Optimization software enables service levels for applications, virtual domains, and workloads as business requirements dictate. It protects mission-critical applications in enterprise environments by specifying service level objectives and service level caps for input/output processors (IOPs) (i.e., performance) and bandwidth. You can also define Latency Goals for your most mission-critical applications. If these goals are not met, Priority Optimization automatically adjusts the service levels of lower-priority applications and workloads in order to assure necessary QoS levels for your highest priority applications.

With the combination of Priority Optimization and Virtual Domains, you can specify thresholds to protect individual tenants, preventing a single tenant from monopolizing resources, for example. These capabilities eliminate the last barrier to consolidation by allowing you to deliver assured QoS levels without having to physically partition resources or maintain discreet storage silos.

Features and benefits

Enable service level performance with a flexible priority policy

- Create and modify threshold limits including I/O per second, bandwidth and latency to meet business needs
- Configure thresholds by volume set with real time enforcement of modified policies within seconds
- Setup easily with autonomic volume sets for efficient service levels

Specify the relative performance of each workload on HPE 3PAR StoreServ

- Control and balance the distribution of HPE 3PAR StoreServ disk bandwidth across workloads on a single system
- Avoid resource contention in the storage system by throttling the I/O of one or more workloads to enable performance of others
- Manage end user application performance expectations

Protect performance of mission-critical applications

With HPE 3PAR Priority Optimization software, you can achieve service-level certainty and predictability for applications and tenants. Consider a tier 1 database (DB) application, for example. The performance of the entire DB depends on the performance of online transaction logs. HPE 3PAR Priority Optimization checks that no other application or workload running on the same storage system will impact its write performance. In a Microsoft® Exchange environment, with Priority Optimization, you can configure a policy that sets a minimal threshold on the IOPs, latency and bandwidth to protect the performance of Exchange DB or log files. When deploying virtualization platforms like VMware® and Microsoft Hyper-V, applying a Priority Optimization rule on the logical unit number (LUN) for a VM storage container file streamlines, either or both input/output operations per second (IOPs) and bandwidth for all virtual hard drives carved out of the container. This is an efficient way to preserve the stable performance of particular virtual machines (VMs). With Priority Optimization, configure mission-critical applications as "high" priority, with other applications as "Medium" or "Low" priority so that under load scenarios, precious system resources are preserved for the workloads with "High" priority.

Set priorities and expectations in an unpredictable environment

Even production quality software can occasionally consume an excessive amount of disk bandwidth resources. DB queries doing a full table scan during business hours, for example, can interfere with transaction based workloads and other interactive applications resulting in high response times. Use HPE 3PAR Priority Optimization to limit the bandwidth consumed by a DB during the day while lifting the limit during nighttime hours.

Consider a storage system where only a fraction of the intended workloads are deployed. Performance for those workloads will initially be excellent, but once other workloads come online it cannot be sustained. To avoid support calls from users who will experience reduced performance, use HPE 3PAR Priority Optimization to set the right expectation level for the users of those initial workloads.

HPE 3PAR Priority Optimization is also helpful in managing periodic variations in workloads—those that run only monthly or quarterly, for example—to reduce their impact on near-continuous production workloads.

Reduce resource contention with performance caps

Support for multi-tenant storage is a must have requirement in modern data centers. But multi-tenancy can create resource contention.

With HPE 3PAR Priority Optimization software, you can reduce contention by limiting maximum performance for a specific application, tenant, or workload, effectively assigning it to a "Bronze" tier. You can also consolidate test and development workloads with production workloads, assuring performance for production and limiting service levels for Test/Dev.

HPE 3PAR Priority Optimization operates by applying minimum goals for IOPs, latency and bandwidth where performance for a specific application or tenant will not be throttled below these goals. Also, Priority Optimization can apply upper-limit control to I/O traffic to and from hosts connected to HPE 3PAR StoreServ Storage. These minimum goals and limits, called quality of service (QoS) rules, are defined for front-end IOPs and for bandwidth, are applied via HPE 3PAR Autonomic Groups and are managed via the HPE 3PAR StoreServ Management Console and the HPE 3PAR CLI. Configure the QoS rules or policies on a Virtual Domain or a Virtual Volume Set (VVset), which may contain a single volume or multiple volumes. Enabling a system QoS rule from VVs and VVsets might not be subjected to a named QoS rule. This prevents any bursty or unplanned increase in I/O traffic on HPE 3PAR StoreServ from these volumes.

In fact, HPE 3PAR Priority Optimization is the industry's only "Latency goal" feature that enables one, to set up SLAs as low as 500 µs, also making it possible to configure service-level objectives in terms of KB/s and I/O bandwidth on a virtual volume set (VVset) or between different virtual domains.

The complete HPE 3PAR software portfolio

Manage

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

Protect

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

Optimize

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

Efficient

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

Predictive analytics powered by StoreFront Remote

Manage: Everything you need to get up and running quickly and efficiently.	Simplified management is offered by the **HPE 3PAR StoreServ Management Console (SSMC)**. The scriptable **HPE 3PAR Command Line Interface (CLI)** gives you powerful customization capabilities that are simple to configure and reduce the need for extra management tools. **HPE 3PAR System Reporter** helps track performance and capacity utilization trends for multiple HPE 3PAR StoreServ systems. Remote error detection along with support for diagnostics and maintenance activities is offered via **HPE 3PAR Service Processor**. Rich file protocols from SMB/CIFS to NFS and FTP, and a RESTful Object Access API for programmatic access to files are offered with **HPE 3PAR File Persona**. Built-in automated SAN configuration is offered with **HPE 3PAR Smart SAN**. **HPE OneView integration**, gives you a web-based interface that is common across enterprise servers, storage, and networking. Support for the **Storage Management Initiative Specification (SMI-S)** provides simplified storage management from within the Microsoft System Center Management framework. With **OpenStack integration**, over both iSCSI and Fibre Channel protocols, the flexibility and cost-effectiveness of a highly resilient cloud-based open source platform that meets the requirements of your mission-critical applications, is offered. HPE 3PAR StoreServ Storage **integration with VMware vSphere®** enables you to take advantage of architectural benefits such as wide striping, a Mesh-Active clustered controller design, mixed workload support, and hardware-assisted VMware vSphere APIs for Array Integration (VAAI) support. **Dockers containers support** helps deliver enterprise-grade storage availability, resiliency and performance for stateful containers.
Protect: Safeguard your most mission-critical of applications.	**HPE 3PAR Remote Copy** offers simple and cost-effective data protection for efficient multi-tenant disaster recovery. **HPE 3PAR Peer Persistence** ensures transparent autonomic failover over metropolitan distances using Remote Copy Synchronous mode. **HPE 3PAR Cluster Extension Software** enables automatic failover across data centers. **HPE Recovery Manager Central** allows you to create, manage, and automate crash-consistent snapshots for any application and app-consistent snapshots for VMware vSphere, Microsoft SQL Server, Oracle and SAP HANA®. **HPE 3PAR StoreServ Data-at-Rest Encryption** protects data from both internal and external security breaches by securely encrypting all data as it is written to the drive. End-to-end data integrity, protection against silent corruption from the host to the storage array is offered via **HPE 3PAR Persistent Checksum**. **HPE 3PAR Persistent Cache** maintains service levels, so they are not impacted by unplanned component failures—a key requirement for the virtual data center. Non-disruptive upgrades to HPE 3PAR StoreServ 8000 Storage systems without relying on multipathing software and without initiating failover is initiated via **HPE 3PAR Persistent Ports**. **HPE 3PAR Virtual Domains and HPE 3PAR Virtual Lock Software** enables different applications and user groups with additional security attached to the retention of storage volumes. **HPE 3PAR File Lock** helps in data immutability (WORM) and long-term retention for data preservation to meet the enterprise governance requirements.
Optimize: Make the best use of the available storage capacity.	**HPE 3PAR Adaptive Sparing** leverages the system's sparing approach to improve the performance and endurance of flash. Performance acceleration is assured by **HPE 3PAR Adaptive Flash Cache**, which reduces application response times. **HPE 3PAR Priority Optimization** assures service levels with QoS controls for mission-critical applications. **HPE 3PAR Peer Motion** enables load balancing at will, wherein movement of data and workloads between arrays does not impact, applications, users, or services. **HPE 3PAR Online Import** is included to enable migration from HPE EVA, EMC, HDS or IBM Storage systems. **HPE 3PAR Adaptive Optimization** improves storage utilization by enabling cost-optimized storage tiering. **HPE 3PAR Express Protect** enables backups to StoreOnce—all through the familiar RMC GUI. **HPE 3PAR Adaptive Reads and Writes** help to avoid unnecessary data reads and writes to reduce latency, enhance backend performance and extend flash media lifespan to lower the total cost of ownership (TCO) for storage. **HPE 3PAR Express Writes** enhances write acceleration that helps optimize CPU utilization and depending on workload, delivers greater throughput. **HPE 3PAR Autonomic cache offload** helps reduce cache bottlenecks by automatically changing the frequency at which data is offloaded from cache to flash media based on utilization rate. **HPE 3PAR Multi-tenant I/O processing** enables performance improvement for mixed workloads or virtual desktop infrastructure (VDI) deployments by breaking large I/O into smaller chunks so that small read requests don't get held up behind larger I/O requests, ensuring reduced latency.
Efficient: Get maximum performance with minimum expenditure.	**HPE 3PAR Zero Detect** reduces the cost of storage by identifying and removing repeated data from incoming data streams. **HPE 3PAR Deduplication** helps reduce the amount of flash needed to store data by preventing the storage of duplicate data. **HPE 3PAR Compression** helps reduce the amount of flash needed to store data by reducing the data footprint. **HPE 3PAR Data Packing** helps improve storage efficiency and bandwidth by condensing multiple smaller data sets together. **HPE 3PAR Virtual Copy Software** protects and shares data affordably with rapid recovery using reservationless, non-duplicative, copy-on-write snapshots. **HPE 3PAR Thin Technologies**—including **HPE 3PAR Thin Provisioning, Thin Conversion, Thin Persistence, and Thin Copy Reclamation**—achieve data compaction by leveraging built-in hardware capabilities. **HPE 3PAR Express Layout**, allows HPE 3PAR controller nodes to share access to SSDs in order to drive efficiency. **HPE 3PAR Express Indexing** helps deduplicate data inline and with a high degree of granularity. **HPE 3PAR Express Scan helps** remove redundant data in-line and prevents wastage of CPU cycles.

Get connected and get back to business
Unlock all of the benefits of your technology investment by connecting your products to HPE Enterprise. Achieve up to 77 percent[1] reduction in down time, near 100 percent[2] diagnostic accuracy and a single consolidated view of your environment. By connecting, you will receive 24x7 monitoring, pre-failure alerts, automatic call logging and automatic parts dispatch. HPE Proactive Care Service and HPE Datacenter Care Service customers will also benefit from proactive activities to help prevent issues and increase optimization. All of these benefits are already available to you with your server, storage and networking products, securely connected to HPE support.

Optimize your IT investment strategy with new ways to acquire, pay for and use technology, in lock-step with your business and transformation goals.
hpe.com/solutions/hpefinancialservices

HPE 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

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

Gain the skills you need with ExpertOne training and certification from Hewlett Packard Enterprise. With HPE Converged Storage training, you will accelerate your technology transition, improve operational performance, and get the best return on your Hewlett Packard Enterprise investment. Our training is available when and where you need it, through flexible delivery options and a global training capability.
certification-learning.hpe.com

[1] IDC

[2] HPE CSC reports 2014–2015

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HPE Technology Services

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

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

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

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

Note: Specific service availability varies by product.

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

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

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

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

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

To learn more, visit **hpe.com/services/storage**.

Learn more at
hpe.com/storage/3PAR

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