Brochure

Hewlett Packard Enterprise

Eliminate Compromise with Flash-Optimized Architecture

HPE 3PAR StoreServ Storage family

Get started >

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Flash-optimized architecture, modern Tier-1 storage

IT has never been more important to business success, which means that storage infrastructure must be simpler, smarter, faster, more flexible, and more business aligned than ever. In the idea economy, business success is defined by how quickly your business can turn ideas into value. Is your data center ready?

With a flexible, **flash-optimized architecture**, HPE 3PAR StoreServ Storage can help you consolidate your applications and workloads from legacy storage as part of your digital transformation. Regardless of whether you are a midsize enterprise experiencing rapid growth, a large enterprise looking to support IT as a Service (ITaaS), or a global service provider building a hybrid or managed private cloud, **HPE 3PAR StoreServ Storage** features a modern architecture to support better business outcomes. A range of models bring Tier-1 data services, deliver all-flash array performance that is predictable and consistent, and provide mission-critical resiliency and quality of service (QoS).

Consolidate with confidence

HPE 3PAR StoreServ Storage offers true convergence of block, file, and object access while eliminating single points of failure so you can consolidate with confidence. By delivering Tier-1 resilience and secure administrative segregation of users, hosts, and application data using virtual machine technology, HPE 3PAR StoreServ Storage lets you serve multiple user groups, applications, and workloads from a single storage system with complete confidence that access to your data will not be compromised or interrupted.

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

Don't just take our word for it.

With the **HPE 3PAR Get 6-Nines Guarantee Program**, HPE stands behind the ability of HPE 3PAR StoreServ Storage systems to deliver data high availability with 99.9999% uptime.[1]

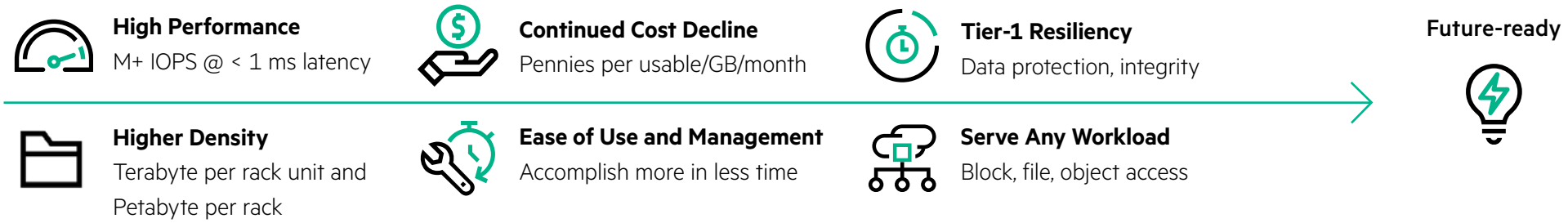


Figure 1. Storage requirements for the idea economy

[1] Contact HPE for full terms and conditions.

HPE InfoSight: AI for the Data Center

HPE InfoSight eliminates wasted time and headaches by transforming how storage is managed and supported. Through AI, predictive analytics and machine learning, HPE InfoSight predicts and prevents problems before your business is impacted. And, as it analyzes and correlates millions of sensors every second, all customers benefit as their systems get smarter and more reliable. HPE InfoSight watches over your infrastructure 24/7 so you don't have to spend your days, nights, and weekends dealing with storage issues anymore.

For 3PAR StoreServ arrays, HPE InfoSight:

- Sees across the infrastructure stack and helps pinpoint issues beyond storage
- Simplifies planning with forecasts into capacity and resource needs
- Proactive fault detection with faster time to resolution
- Global visibility with detailed performance, capacity, and bandwidth analytics

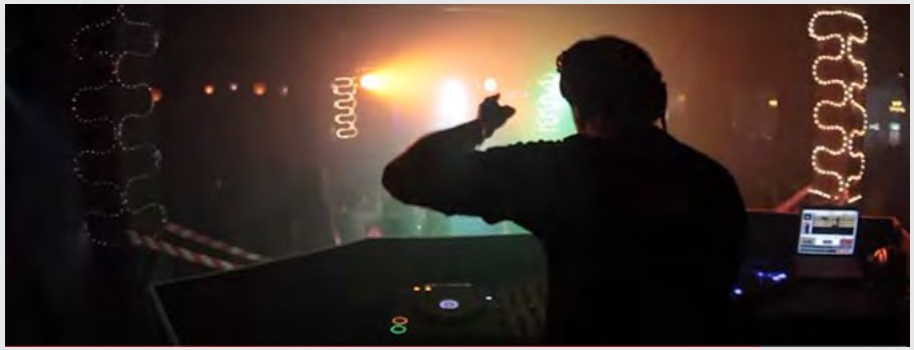
RIVERSIDE HEALTHCARE

Riverside Healthcare speeds access to critical medical images with all-flash HPE 3PAR

HPE 3PAR StoreServ Storage improves responsiveness of critical radiology picture archiving and communication system (PACS) that directly impacts patient diagnosis and care, and ensure high performance and availability for other core healthcare and business applications.

Read the case study

SOCAN turns up the volume on digitally streamed data with flash storage from HPE



"With the HPE 3PAR StoreServ solution, it is a 4-node system, and it load balances very well, it actually does it automatically for us. It's been great. We've been doing maintenance upgrades on the solution with little to no impact at all. It's perfect.

We've seen a huge increase in our throughput. It's allowed us to step back and think about how we work as an organization."

– Trevor Jackson, Senior Director—Information Technology, Society of Composers, Authors and Music Publishers of Canada

YOOX NET-A-PORTER GROUP

YNAP powers online retail stores with HPE 3PAR Storage and HPE Flexible Capacity

HPE 3PAR StoreServ Storage improve storage performance and capacity to handle unpredictable surges in e-commerce transactions.

Read the case study

Accelerate performance

HPE 3PAR StoreServ Storage makes innovative use of flash-based storage technologies to give **you a choice between all-flash arrays, converged flash arrays that use solid-state storage** tiered with spinning media, and the use of flash-based media to extend system cache.

HPE Flash Now

Evaluating the cloud but not sure you're ready to surrender your data? Looking to reduce storage costs but don't like the idea of ceding control and stomaching new security risks? **HPE 3PAR Flash Now** brings public cloud-like economics to your on-premises flash storage deployment. Maintain control of your data for less than the cost of outsourcing it to the public cloud.

HPE 3PAR Flash Advisor Toolset

Wondering about the return on investment of adding flash to your existing infrastructure? With the HPE 3PAR Flash Advisor Toolset, you can get the most out of your current storage investment by understanding the benefits of adding flash.

Figure 2. All-flash HPE 3PAR StoreServ Storage

Serve a broad spectrum of workloads

HPE 3PAR StoreServ incorporates multi-protocol support into the system architecture to deliver a tightly integrated, converged solution for provisioning both block volumes and file shares from a single storage system. Unlike traditional solutions, this converged solution extends the architectural benefits that the HPE 3PAR StoreServ Storage system already delivers for block workloads to file shares and object access in a way that is simple to deploy and administer.

HPE 3PAR File Persona enables a rich set of file protocols, file data services, and an Object Access API (REST) and gives you the ability to provision file shares in addition to block volumes from a single graphical user or programmatic management interface. This solution extends the spectrum of storage workloads natively addressed by the system's default Block Persona. The Block Persona is ideal for your virtualization, database, and application workloads with the File Persona enabling home directory and user shares, enhanced content management and collaboration, and data preservation and governance.

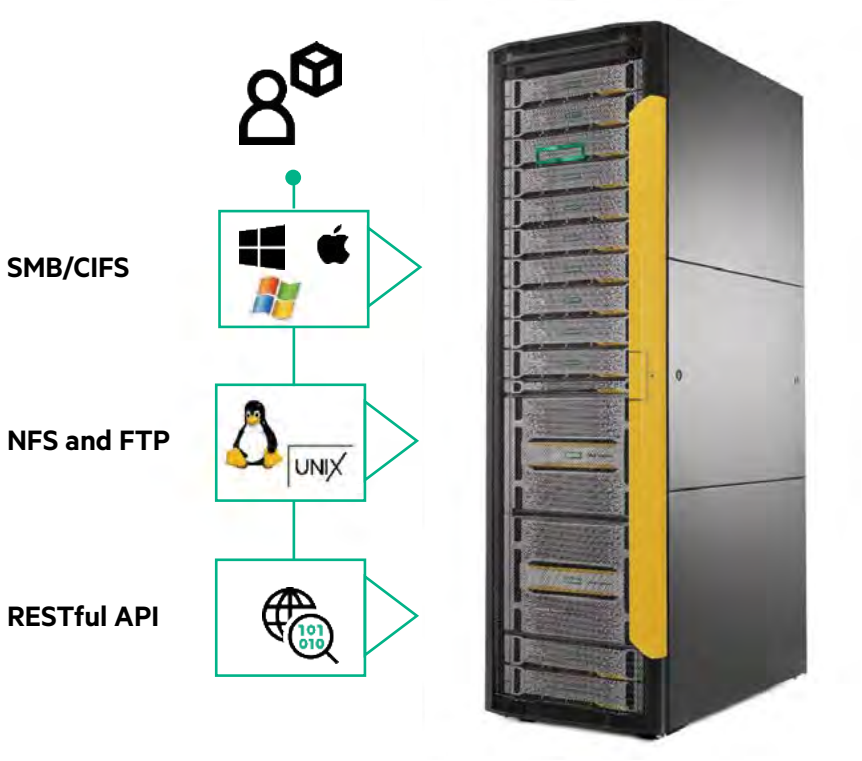


Figure 3. HPE 3PAR File Persona Software built into the HPE 3PAR OS

HPE 3PAR Data Reduction Guarantee

You can save on the cost of a storage technology refresh and increase storage ROI by keeping incremental purchases, administration, and operating costs low over time. **These technologies** help you get the most out of your system's flash capacity and reduce your total cost of storage while improving flash media endurance. In fact, the **HPE Data Reduction Guarantee** offers assured storage efficiency for your workload—guaranteed.[2]

Free storage efficiency assessment

Do you know how to reduce energy, floor space, and disk capacity requirements while slashing administrative time?

Get a FREE storage assessment from HPE that includes:

- A complete efficiency audit of your current storage
- Storage utilization ratios and standard capacity
- Array sizing needed to meet SLAs

Sign up now

Maximize your all flash investment

HPE 3PAR Adaptive Data Reduction technologies, including data packing, deduplication, and compression, enable flash affordability. These features reduce storage costs for total storage efficiency by minimizing your data footprint and improving flash media endurance, at no extra cost.

The software includes inline deduplication for any SSD tier that allows the system to run in a state of consistent high-capacity utilization without performance tradeoffs. Express Scan carries out inline compression that removes redundant data and prevents wasted CPU cycles while Data Packing condenses data to a single page increasing storage efficiency and bandwidth.

You save on the cost of a storage technology refresh and increase storage ROI by keeping incremental purchases, administration, and operating costs low over time.

[2] Subject to qualification and compliance with the HPE 3PAR Data Reduction Guarantee details

Respond faster

Simplify, automate, and expedite management with storage that is self-configuring, self-provisioning, and self-optimizing. HPE 3PAR StoreServ Storage eliminates traditional manual storage planning and changes management with autonomic management and optimization features that are intelligent, take place at a subsystem level, and don't require administrator intervention.

These features let you respond quickly by shrinking provisioning time from hours, weeks, and days to just seconds. Automation also reduces 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.

Eliminate complexity

HPE Smart SAN for HPE 3PAR reduces end-to-end SAN complexity for flash deployments by orchestrating SAN host provisioning (SAN zoning) automatically. To address the complexity and tedious nature of traditional SAN switch zoning, HPE leveraged an industry standard FCIA T-11 definition for peer zoning, added a set of creative software features in HPE 3PAR StoreServ, and collaborated with HPE StoreFabric FC to implement HPE Smart SAN support in their FC solutions.

Load balance without virtualization complexity

HPE 3PAR StoreServ Storage supports federated data mobility across Tier-1, and midrange arrays so you can manage resources at the data center level without external virtualization appliances.

- Respond to unpredictable and dynamic demands by moving data and workloads between arrays without impact to applications, users, or services
- Eliminate additional virtualization layers and management overhead with peer-based storage federation
- Map workloads to the right resources and establish tiers of storage across the data center for different service-level objectives
- Improve data availability and protection in clustered VMware® and Microsoft Hyper-V environments

Painless modernization onto Tier-1 storage

This federated data mobility also simplifies technology refreshes by eliminating data migration as a pain point—including:

- Replacing legacy EMC VMAX, CLARiiON CX4, DMX4 and VNX, VNX2 arrays
- **Replacing HDS TagmaStore Network Storage Controller (NSC), Universal Storage Platforms (USP), Universal Storage Platform V (USPV), Universal Storage Platform VM (USP VM) and Virtual Storage Platforms (VSP)**
- **Replacing legacy IBM XIV Gen 2 or Gen 3 systems**

Shield your business from application downtime RMC

Application downtime can be fatal to your business and can come from a variety of sources—from human error to natural disasters. As a result, data protection is a continuum that must cover a wide range of scenarios.

HPE 3PAR StoreServ Storage offers **a highly resilient, Tier-1 architecture** that provides the first line of defense against application outages with high availability features such as fault tolerance and hardware redundancy. **Point-in-time (PIT) snapshots** add additional protection against application errors and data corruption or loss.

Low-cost remote replication protects against site-wide outages and natural disasters with the flexibility to replicate between any member of the HPE 3PAR StoreServ family—regardless of model. Add to this online, disk-based backup with **HPE StoreOnce Systems** and you have comprehensive data protection that minimizes your risk from all angles.

HPE StoreOnce increases your application protection level by letting you maintain more frequent snapshots for longer and for less. Free up flash capacity on your HPE 3PAR StoreServ array by offloading snapshots to more cost-effective backup. Free your data center from dependence on traditional backup infrastructure by taking advantage of **direct backup** to reduce backup ISV licensing costs.

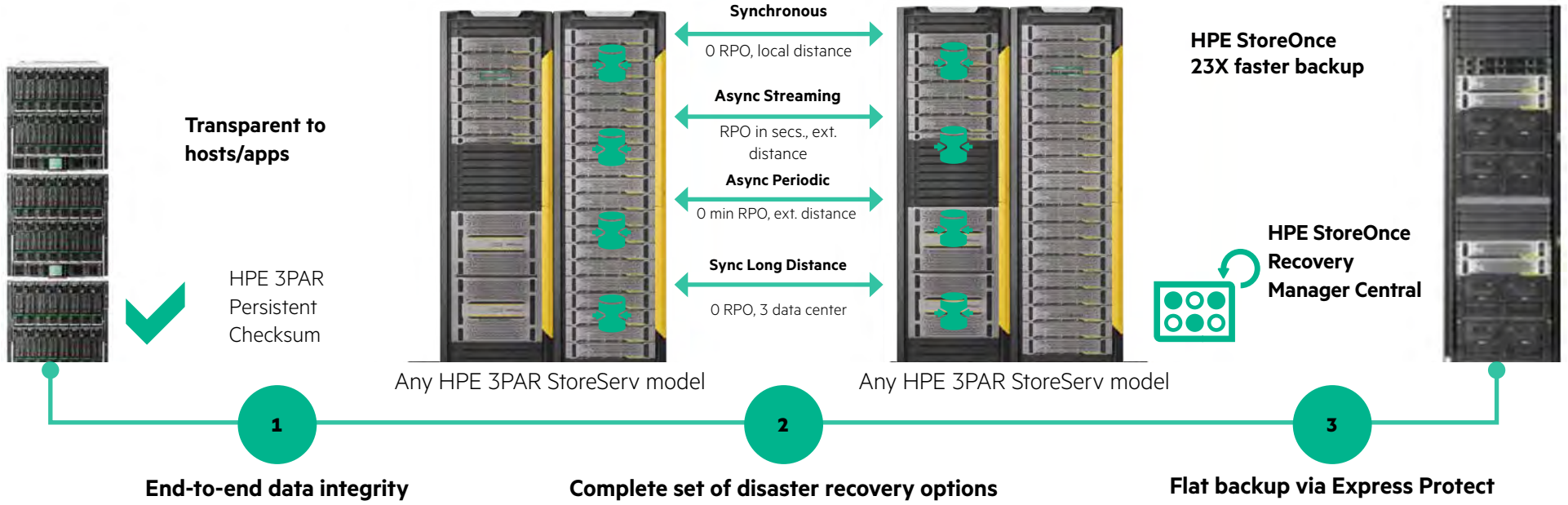


Figure 4. End-to-end availability and protection for enterprise applications with HPE StoreOnce Recovery Manager Central

Setting new standards for agility and efficiency

With a **modern architecture built for virtualization, the cloud, and ITaaS**, HPE 3PAR StoreServ Storage anticipates new requirements with a resilient, secure, multi-tenant platform that lets you:

- Provision instantly
- Improve provisioning agility 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.

High Performance
Flash-optimized architecture

Application Integration
Integration with VMware, Oracle, Microsoft SQL and Exchange

Reliability
Proven, highly resilient architecture

Ease of Use
Self-configuring, self-optimizing, and self-tuning

Scalability
Scale-out architecture with multiple Active-Active nodes

Drive Efficiency
Get the most out of your flash investments

Disaster Recovery
Data protection with multi-site synchronous and asynchronous replication

Data Mobility
Federate across systems and sites for greater efficiency

Flash-optimized architecture featuring a Mesh-Active design

HPE 3PAR StoreServ Storage features a Mesh-Active design based on a unique system of controller interconnects. **This flash-optimized architecture** combines the benefits of monolithic and modular architectures while eliminating price premiums, scaling complexities, and the performance bottlenecks of legacy storage designs.

Unlike legacy Active-Active controller architectures, the HPE 3PAR Mesh-Active design allows each volume to be active on every controller in the system. This delivers robust, load-balanced performance and greater headroom for cost-effective scalability.

A high-speed, full-mesh interconnection joins multiple storage controllers to form a cache-coherent, flash-optimized Mesh-Active cluster that is ideal for low-latency, high-performance, internode communication. Purpose-built HPE 3PAR Gen5 ASICs in each node connect all controllers via dedicated, high-bandwidth, low-latency links and spread I/O workloads widely across the array using direct memory access (DMA) to reduce latency times.

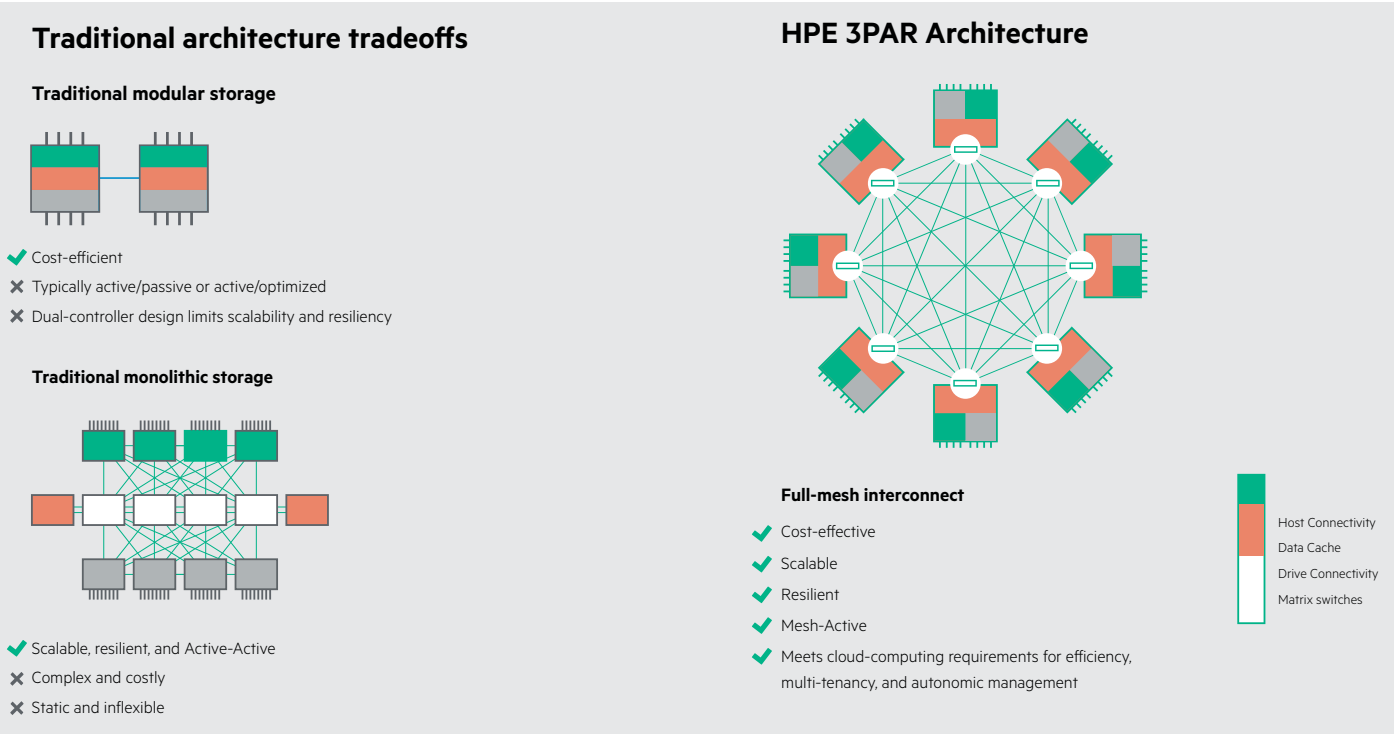


Figure 5. Legacy architectures versus HPE 3PAR StoreServ Storage

Fine-grained virtualization and system-wide striping

The **HPE 3PAR Architecture** uses three levels of storage virtualization to drive up capacity utilization and accelerate performance. This fine-grained approach to storage virtualization:

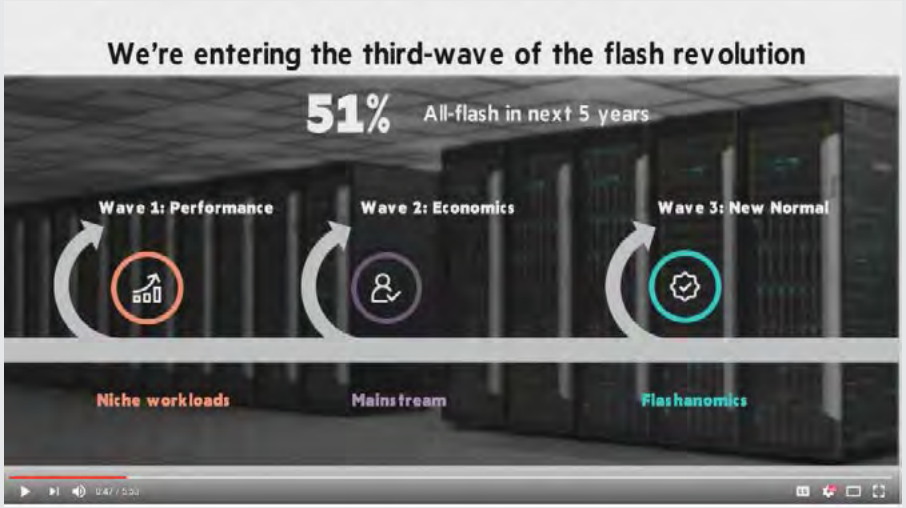
- Divides each physical disk into granular allocation units that can be independently assigned and dynamically reassigned to different logical disks to create virtual volumes
- Enables mixed RAID levels on the same physical drive
- Supports flash and other nonvolatile memory types

Logical disks are the virtualization layer in which QoS parameters are applied (availability level, drive media type, RAID level, etc.). This enables sub-LUN tiering and system-wide striping of data, increasing capacity utilization and performance levels. Fine-grained virtualization combined with system-wide striping drives uniform I/O patterns by spreading wear evenly and system-wide. System-wide sparing also helps guard against performance degradation if there is a media failure by enabling faster, "many-to-many" rebuilds.

Learn more

Download the **HPE 3PAR StoreServ Architecture** technical white paper.

HPE 3PAR StoreServ Storage



HPE 3PAR StoreServ Storage provides a single product family across midrange and high-end flash arrays designed to meet the demands of ITaaS. It is the only primary storage platform you need to respond to change with agility and efficiency.

Unique technologies extend your flash investments

HPE innovations around flash not only help bring down the cost of flash media, but HPE 3PAR Gen5 Express ASICs within each node also provide an efficient, silicon-based mechanism that extends your flash media investments.

HPE 3PAR Adaptive Data Reduction software—including inline Deduplication for any SSD tier—allows the system to run in a state of consistent high-capacity utilization without performance tradeoffs; compression with inline Express Scan removes redundant data and prevents wasted CPU cycles; Data Packing condenses data to a single page increasing storage efficiency and bandwidth. You save on the cost of a storage technology refresh and increase storage ROI by keeping incremental purchases, administration, and operating costs low over time.

Adaptive Sparing technology

HPE Adaptive Sparing leverages the system's sparing approach to improve the performance and endurance of flash. Other architectures often reserve entire drives to use as "hot" spares—these drives are not used unless another drive in the system fails which is expensive and inefficient. Instead, the HPE 3PAR architecture reserves a small amount of "spare" space in each drive. HPE 3PAR StoreServ's patented Adaptive Sparing technology takes the spare space and hands it back to the drive's firmware to increase the internal capacity used by the drive for housekeeping tasks. Adaptive Sparing technologies are so powerful they can increase SSD endurance up to 5X over the drive's standalone endurance capability while also increasing write performance.

Persistent technologies for Tier-1 resiliency

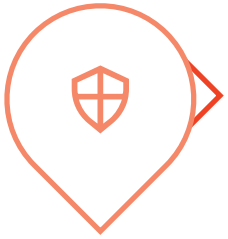
HPE 3PAR StoreServ Storage systems deliver Tier-1 resiliency via built-in hardware redundancy reinforced with persistent software technologies:

- **Peer Persistence**
  - Keeps your business-critical applications running seamlessly with automated, transparent failover and failback
  - Delivers effortless resilience that comes with VMware vSphere® Metro Storage Cluster (vMSC) certification and support for Microsoft Windows Server® and Microsoft Windows® Hyper-V environments. Support for a third data center provides extreme data protection where customers have not only non-disruptive data mobility in case of local storage failure, but also a complete disaster recovery plan by replicating the same data to a third site
- **Persistent Cache**
  - Removes performance impacts resulting from unplanned component failures; is ideal for maintaining service levels in the virtual data center
  - Leverages the unique Mesh-Active design to preserve write caching in the event of a failure by rapidly "remirroring" cache to other nodes within the cluster
- **Persistent Ports**
  - Supports high availability in virtualized environments
  - Automatically fails over any front-end controller port that experiences laser loss
  - Enables transparent switchover of host path connections
  - Keeps host paths online throughout the software upgrade process
- **Persistent Checksum**
  - Ensures end-to-end data integrity, protecting against silent corruption from the host to the storage array

The complete HPE 3PAR software portfolio

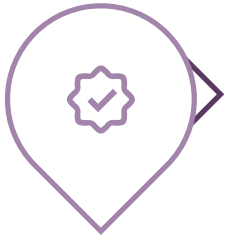
Management

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



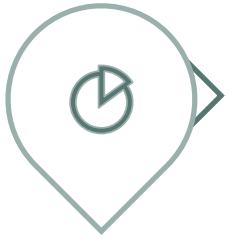
Protection

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



Optimization

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



Efficiency

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

Figure 6. The HPE 3PAR software portfolio

Application-managed storage

HPE invests in technologies to support key strategic IT initiatives by working with partners such as VMware, Citrix®, Red Hat®, Oracle, Symantec, Microsoft, and SAP® to develop integrated, platform-specific storage solutions that work with HPE 3PAR StoreServ Storage.

Storage built for ITaaS, virtualization, and cloud apps

Exclusive virtualization and automation features built into HPE 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. HPE 3PAR StoreServ's advanced storage technologies and hypervisor integration optimize your VM density and storage efficiency. It's why VMware chose HPE 3PAR StoreServ as the Fibre Channel reference platform for the development of its Virtual Volumes (VVols) technology.

Take five minutes to estimate your savings

Calculate the potential three-year cost savings and ROI from migrating your data from traditional storage to HPE 3PAR StoreServ Storage. Click **here** to get started saving with the HPE Storage Quick ROI Tool.

Learn more at
hpe.com/storage/3par
Download the full version of the HPE 3PAR StoreServ Family Brochure here

Sign up for updates

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