

OVERVIEW

HITACHI VIRTUAL STORAGE PLATFORM ANSWERS YOUR KEY CHALLENGES

Run Applications at Peak Performance

- Deliver up to 4M IOPS of flash-accelerated performance.
- Respond in <1ms for a leading 99.6% of transactions.
- Automatically maximize performance in real time with Hitachi Dynamic Tiering active flash.

Simplify for Greater IT Efficiency

- Employ inline compression offload.
- Virtualize and manage all storage from a single view.
- Automate application-specific provisioning in seconds.
- Nondisruptively migrate data with no application downtime.

Eliminate Risks

- Improve business continuity with active-active clustering via global-active device.
- Meet tight service level agreements (SLAs) and standardize data protection.
- Leverage the industry's only 100% data availability guarantee.
- Deploy industry-standard XTS-AES-256 bit encryption.

Build a Flash Accelerated, Software-Defined Infrastructure

The Hitachi Virtual Storage Platform (VSP) family of storage systems now offers the ultimate in enterprise storage technology in your choice of midrange to high-end systems. Built on 20 years of experience and an industry-leading 3,500+ storage patents, the VSP family provides unparalleled performance, efficiency and reliability. Hitachi is ranked highest in value among midrange storage vendors¹ and highest in overall product score for high-end storage². Consistently ranked among the industry leaders in reliability³, Hitachi offers the industry's only 100% data availability guarantee.

Powered by Hitachi Storage Virtualization Operating System (SVOS), VSP systems deliver best-in-class, flash-accelerated scalability, simplified management and advanced data protection that eliminates



downtime. VSP systems also include up to eight times greater memory cache, two times more connectivity and four times more cores than the previous generation. These improvements result in up to four times greater performance, including the lowest response time in the industry⁴.

To help you on your journey to the all-flash data center, VSP systems can be configured in hybrid or all-flash configurations. These systems include more than 200 flash optimizations designed to deliver increased performance, lower latency and improved resiliency to meet your most demanding performance challenges. With the new flash module drives (FMD DC2) Hitachi enables you to take these benefits even further, delivering enterprise performance and consistent low latency that cannot be achieved with off-the-shelf solid-state disks (SSDs).

The Foundation for the Software-Defined Data Infrastructure

The software-defined infrastructure (SDI) is vital to businesses because it provides the automation for simplicity, more access to data for insight, and abstraction for greater agility that businesses need to run and grow, quickly and efficiently. VSP family systems running SVOS are designed with this future in mind: to deliver maximum performance, IT efficiency and resiliency in your infrastructure, while eliminating complexity.

Every VSP system has the ability to virtualize and consolidate storage management under a single view. Each allows IT organizations to provide a common method of controlling storage operations, independent

of how the physical hardware evolves over time. Automated, application-specific, service-level-driven resource management for provisioning and data protection enables tasks to be completed in seconds. It eliminates repetition and risk associated with potential human error, so your team is more responsive and achieves a higher level of customer satisfaction.

With VSP family systems, you can:

- Virtualize an industry-leading 100+ types of storage.
- Leverage powerful SVOS feature sets across all storage, upleveling the capabilities of external third-party storage.
- Centralize day-to-day administration with a single management view.

These features, combined with a powerful set of data management functions, enable organizations to build an IT infrastructure that is flash accelerated and software defined.

Key Features and Benefits of VSP Systems

Hitachi Storage Virtualization Operating System

Hitachi Storage Virtualization Operating System is the only storage operating system that scales from midrange to high end and mainframe. It provides the foundation for a software-defined infrastructure that delivers superior storage performance, automated, simplified management and high availability.

The enterprise-grade capabilities in Hitachi's flash-accelerated SVOS include system element management and advanced storage system features. For example, the global-active device feature enables superior business continuity by providing a true

VSP Family
at a Glance

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active-active cluster that spans systems and metro distances. Additional features include:

- Real-time automated tiering and thin provisioning.
- Nondisruptive data migration.
- Automated storage service-level controls.
- Data-at-rest encryption.
- Simplified performance analytics and correlation.
- Deduplication for up to 90% storage savings.
- Cloud optimized with automatic file tiering capabilities.

Hitachi Accelerated Flash Storage

Combining the flash optimizations of SVOS and our patented flash module drives, Hitachi Accelerated Flash (HAF) delivers best-in-class performance and efficiency for hybrid and all-flash VSP systems. For hybrid systems, HAF software provides automated, active-flash tiering that monitors and moves data to flash in real time, so you can be more responsive to sudden changes in workloads and deliver an “all-flash” experience.

HAF, built with our new FMD DC2, delivers increased real application performance at lower latency, improved efficiency with inline compression⁵, and a higher resiliency than other offerings. FMD DC2 uses specially designed flash modules that are up to five times faster than off-the-shelf SSDs, so applications run faster and are less likely to slow down, even as workload I/O increases. FMD DC2 embedded ASIC enables accelerated data compression that runs 10 times faster than competitive offerings, freeing up system resources so that more hosts and applications can be supported. Compared to most solid-state systems, it also offers greater total system capacity of up to 8PB effective capacity.

Integrated Active Mirroring

This capability ensures the highest data protection service level for zero downtime and no data loss. Global-active device feature supports read/write copies of the same data in two places at the same

OPTIONS FOR MAXIMUM FLEXIBILITY

The Hitachi Virtual Storage Platform family includes a range of versatile, scalable storage systems to manage your choice of data.

- 1. Unified configuration: VSP and Hitachi NAS Platform.** Add a high-performance, clustered file option for completely unified storage that can scale to eight file nodes. Select from four models to scale to over 5PB internal capacity. HNAS also provides automatic and user transparent deduplication that provides up to 90% storage savings. Combine this with our data migrator to cloud feature to allow tiering of lesser used files to Hitachi Content Platform (HCP) or public cloud services, such as Hitachi Managed Cloud Services, Amazon S3 or Microsoft® Azure™. And, free up primary storage for critical applications. VSP G400, VSP G600 and VSP G800 are also able to support up to two NAS modules internally, per system that provides fully unified capability in a dense form factor.
- 2. All-flash configuration: VSP and Hitachi Accelerated Flash.** Add Hitachi Accelerated Flash with new flash module drives (FMD DC2) with inline compression⁵ to scale up to 8PB of effective flash capacity, with high density and performance.
- 3. Virtualization only: VSP and Hitachi Storage Virtualization Operating System.** Use SVOS to natively virtualize external storage and scale up to 64PB with automated, simplified management.
- 4. Mainframe only: VSP G1000 and IBM® FICON® connectivity option.** Supports mainframe storage features, including PAV, HyperPAV, dynamic volume expansion (DVE), extended address volumes (EAV), peer-to-peer remote copy (PPRC), and IBM high-performance FICON with multitrack, plus basic and IBM GDPS® HyperSwap®, XRC, IBM FlashCopy®, and FlashCopy Space Efficient.

time. Its active-active design implements cross-mirrored storage volumes between two matched VSP systems that accept read/write I/Os on both sides, which are continuously updated. If a disk controller failure occurs at one site, the controller at the other site automatically takes over and accepts read/write I/Os.

Global-active device assures that an up-to-date storage volume is always available and enables production workloads on both systems, while maintaining full data consistency and protection.

Automated Workflow

This capability accelerates storage provisioning for critical business applications to quickly deliver new IT services. Hitachi Automation Director software enables storage infrastructure self-service with intelligent automated workflows that incorporate storage management best practices. Through infrastructure abstraction, common and repeatable storage

management tasks can be simplified, improving reliability and helping to deliver new IT services quickly to the business.

The No-Compromise Choice From the Leader in Storage Design

The Hitachi Virtual Storage Platform family provides the ultimate in enterprise storage technology. Based on the industry-leading storage technology, the systems offer reliable, enterprise-grade capabilities at the price, capacity and performance levels necessary to satisfy your unique requirements.

Our VSP family systems use the same operating system, network file services, management and data protection services across all the family, enabling you to reduce administrative as well as service times. By virtualizing and consolidating storage management under a single view, these systems and services help you move further down the path toward a software-defined infrastructure. And you enjoy best-in-class performance, greater IT efficiency, lower risk and far less complexity, no matter what challenges the future presents to your business.

¹ Info-Tech Vendor Landscape Report 2013

² Gartner, *Critical Capabilities for General-Purpose, High-End Storage*, November 2014

³ See, for example: Storage Magazine's Quality Awards, April 2015

⁴ http://www.storageperformance.org/results/benchmark_results_spc1_top-ten

⁵ Based on typical 2:1 compression

 **Hitachi Data Systems**



Corporate Headquarters

2845 Lafayette Street
Santa Clara, CA 95050-2639 USA
www.HDS.com community.HDS.com

Regional Contact Information

Americas: +1 866 374 5822 or info@hds.com
Europe, Middle East and Africa: +44 (0) 1753 618000 or info.emea@hds.com
Asia Pacific: +852 3189 7900 or hds.marketing.apac@hds.com

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