HITACHI
Inspire the Next

OVERVIEW

Hitachi Virtual Storage Platform Family

Advanced Storage Capabilities for All Organizations

As business moves faster and grows more complicated, IT faces increased pressure to keep pace. Infrastructure performance has to improve, and at the same time, IT has to control risks while adding new services faster than ever.

Many storage infrastructures simply cannot keep pace with today's demands. New solutions that deliver greater performance, IT efficiency and reliability are needed. And to meet future demands, these solutions need to lay the foundation for a software-defined infrastructure that has the agility to quickly adapt as demand grows and shifts.

HITACHI VIRTUAL STORAGE PLATFORM ANSWERS YOUR KEY CHALLENGES

Run Applications at Peak Performance

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

Simplify for Greater IT Efficiency

- 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 vendors[1] and highest in overall product score for high-end storage array[2]. Consistently ranked among the industry leaders in reliability[3], 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 previous generation, for up to four times greater performance, including the lowest response time in the industry[4].

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. The Hitachi 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 Hitachi VSP system has the ability to virtualize and consolidate storage management under a single view so that IT organizations can 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 and eliminates repetition and risk associated with potential human error so your team is more responsive and achieves a higher level of customer satisfaction.

With the Hitachi 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 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.

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 compression[5], 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 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.

Hitachi Unified Storage

Deploy and manage a single consolidated storage repository that can serve SAN, NAS and object workloads. With Hitachi Unified Storage (HUS) you simplify IT operations and eliminate silos of storage that reduce return on assets and effectiveness of budget. HUS and Hitachi NAS Platform use a hardware-accelerated hybrid-core architecture. This architecture efficiently consolidates capacity across multiple applications and simplifies storage management for enterprise environments, without compromising performance and scalability.

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.

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: Hitachi 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.
2. **All-Flash Configuration: Hitachi VSP and Hitachi Accelerated Flash.** Add Hitachi Accelerated Flash with new flash module drives (FMD DC2) with inline compression[5] to scale up to 8PB of effective flash capacity, with high density and performance.
3. **Virtualization Only: Hitachi VSP and Hitachi Storage Virtualization Operating System.** Use Hitachi SVOS to natively virtualize external storage and scale up to 64PB with automated, simplified management.
4. **Mainframe Only: Hitachi 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.

The No-Compromise Choice From the Leader in Storage Design

The Hitachi VSP family provides the ultimate in enterprise storage technology. Based on the industry's 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] 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

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OB-059-D DG February 2016