All-Flash and Hybrid Flash for Block, File and Mainframe

Businesses are under increasing pressure to stay relevant and succeed. To maintain customer interest and maximize revenue, businesses must transform their operations to be more efficient and deliver information faster. At the same time, it is critical that the infrastructure delivers enterprise reliability and operational simplicity.

Legacy IT infrastructures lack the speed required to rapidly serve data to online, mobile users. They are also inefficient, making it costly and complex to deliver growing data sets to teams analyzing customer trends or deploying new business models.

All-flash arrays (AFAs) and hybrid-flash arrays (HFAs) can help, delivering data faster to improve customer experiences. However, few AFAs or HFAs support the broad range of workloads businesses run or deliver the advanced capabilities required to keep IT operations running at maximum efficiency. They also lack scalability to handle multiple workloads, resulting in poor utilization and data center sprawl. Ultimately, this results in a higher cost of ownership and lower customer satisfaction. With the Hitachi Virtual Storage Platform (VSP) family you no longer have to compromise.
HITACHI VIRTUAL STORAGE PLATFORM ANSWERS YOUR KEY CHALLENGES

Run Applications at Flash Speed for More Workloads
- Deliver up to 4.8M IOPS of flash performance with all-flash VSP F series or hybrid VSP G series systems.
- SAN, NAS and mainframe support enable superior consolidation of workloads onto a single all-flash or hybrid platform.
- All-flash VSP F series systems respond in < 1ms for a leading 99.6% of transactions.
- Deploy powerful quality of service (QoS); QoS is adaptive, activating when needed so that you get maximum leverage of systems and prevent latency spikes.
- Automatically maximize VSP G series hybrid storage flash performance in real time with Hitachi Dynamic Tiering active flash.

Best-in-Class Data Center Efficiency
- Reduce capacity needs by 5:1 or more with adaptive data reduction services, including deduplication and compression.
- Minimize on-site storage needs dramatically with direct connection to the cloud.
- Cut costs and accelerate DevOps with linked snapshot clones that enable testing new business ideas or application versions while using near-zero extra capacity.

Simple Management and Monitoring
- Consolidate and simplify IT by virtualizing all storage under a single view. ¹
- Reduce time spent managing storage, even for IT generalists, with Hitachi Storage Advisor (HSA) at-a-glance monitoring.
- Nondisruptively migrate data with no application downtime.

Peace of Mind, Guaranteed Return
- 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.
- Benefit from all-flash data reduction.

Key Features and Benefits of VSP Systems

Flash Speed for More Workloads
The Hitachi Virtual Storage Platform family of storage systems now offers the ultimate in enterprise storage technology in your choice of midrange to high-end systems. All-flash VSP F series systems and hybrid flash VSP G series systems give you more choice in how you design your data center, while delivering industry-leading data management. Built on 20 years of experience and an industry-leading 4,000+ storage patents, the VSP family of all-flash and hybrid systems provides unparalleled performance, efficiency and reliability. Hitachi is ranked highest in value among midrange storage vendors ² and highest in overall product score for high-end storage ³. Consistently ranked among the industry leaders in reliability ⁴, Hitachi offers the industry’s only 100% data availability guarantee.

For organizations looking to implement a modern, all-flash data center, Hitachi offers the all-flash VSP F series. VSP F series delivers up to 4.8M IOPS of scalable performance through an enhanced, flash-aware I/O stack that leverages flash-specific data processing and priority data handling to reduce system latency as well as potential latency from background flash media management. This is combined with new flash virtual memory scaling, which offloads tasks from Hitachi Storage Virtualization Operating System (SVOS) to flash modules (FMDs). Together, these features enable more of your transactions to be executed with sub-millisecond response. These improvements result in up to four times greater performance, including the lowest response time in the industry ⁴.

IT executives looking for a staged transition to all flash can achieve significant benefits from hybrid VSP G series, which can be transitioned to an all-flash configuration transparently, over time. VSP G series delivers advanced, active flash tiering that analyzes data streams in real time and moves data from disk to flash for rapid access by applications. This enhanced method of tiering gives organizations the ability to meet demanding performance SLAs with a cost-effective mix of flash and disk. Over time, disk can be replaced with flash for a seamless transition to a modern, all-flash configuration.

Unified Storage
To enable greater consolidation and operational simplicity, the VSP family provides support for both block and file workloads. SAN and NAS protocols are supported, enabling organizations to serve a wide variety of internal and customer-facing applications from a single high-performance array. And for mainframe users, the VSP family can be integrated with mainframe applications for an unprecedented level of performance and operational resiliency.

High-End Enterprise Storage and Mainframe Compatibility
The new VSP F1500 and VSP G1500 deliver IBM®-tested and compatible mainframe support and scale-out resiliency. They enable businesses to achieve greater performance on mission-critical applications as well as scalable, high-speed data reduction. Compared to VSP G1000, VSP G1500 runs deduplication fingerprinting 50% faster and accelerates individual workloads up to 40%. This enables organizations to realize return on investment sooner and reach the maximum 4.8M IOPS faster. For all-flash needs, the VSP F1500 offers 4.8M IOPS and up to 8PB of raw capacity. These capabilities enable powerful scaling at a superior price-performance value.

¹ Available after initial release on Hitachi Virtual Storage Platform F series. Contact your HDS representative or HDS reseller for details regarding availability.
² Gartner, Critical Capabilities for General-Purpose, High-End Storage, November 2014
³ Info-Tech Vendor Landscape Report 2013
⁴ See, for example: Storage Magazine’s Quality Awards, April 2015
⁵ http://www.storageperformance.org/results/benchmark_results_spc1_top-ten
VSP family systems also deliver global storage virtualization, enabling over 100 different types of disk, hybrid and even all-flash arrays to be used as VSP system capacity. A single data management offering can be used to control storage infrastructure, simplifying day-to-day operations. Automated, application-specific, service-level-driven resource management for provisioning and data protection enables tasks to be completed in seconds. Repetition and risk associated with potential human error are eliminated, so your team is more responsive and achieves a higher level of customer satisfaction.

SVOS compatibility features include PAV, HyperPAV, dynamic volume expansion (DVE), extended address volumes (EAV), peer-to-peer remote copy (PPRC), and IBM high-performance FICON® with multi-track, FICON forward error correction, plus basic and IBM GDPS® HyperSwap®, IBM XRC, IBM FlashCopy®, IBM zHyperWrite and IBM zHPF Extended Distance II.

**Best-in-Class Efficiency**

To deliver the most value from storage investments and control overall data center costs, the VSP family offers a broad range of data reduction and storage efficiency services. Adaptive data reduction services, including deduplication and compression, minimize the storage footprint, enabling savings of 5:1 or greater. These savings can be combined with our direct cloud connect functionality to transparently move file data to your choice of content repository or cloud service (Hitachi Content Platform, Amazon Web Services or Microsoft® Azure). This enables unparalleled reduction in on-site storage costs and more predictable ongoing storage costs. All services are selectable and can be activated for specific workloads, giving you maximum control over efficiency and performance.

For organizations looking to develop new business offerings while controlling costs, the VSP family offers a range of versatile, scalable storage systems to manage your choice of data.

1. **Unified storage**: Support file workloads and improve storage efficiency with file optimized, field-programmable gate array (FPGA) accelerated 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.

2. **All-flash models**: VSP F series systems with new flash modules (FMD DC2 and FMD HD) scale up to 40PB of effective flash capacity, with high density and performance.

3. **Virtualization only**: VSP G series 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 F1500, VSP G1500 and IBM FICON connectivity option.

**OPTIONS FOR MAXIMUM FLEXIBILITY**

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

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6 Available after initial release on Hitachi Virtual Storage Platform F series. Contact your HDS representative or HDS reseller for details regarding availability.
Simple, Powerful Management

VSP family is designed to be set up quickly and managed at a glance using Hitachi Storage Advisor (HSA). Designed for IT generalists, HSA uses an intuitive graphical user interface (GUI) and recommended configuration practices to dramatically reduce the time to complete provisioning tasks as well as any diagnostic operations.

For organizations that have their own management tool set, HSA includes standards-based application program interfaces (APIs) that enable administrative operations to be centralized on your company’s preferred management application.

Delivering the best possible customer experience requires more than a fast array. It requires an optimized ecosystem. HDS understands this and offers scalable storage analytics via Hitachi Infrastructure Analytics Advisor (HiAA). HiAA looks across servers, virtual machines (VMs), and network and storage resources to optimize performance as well as long-term storage utilization. Standard reports provide quick views of the current operating environment and custom reporting capabilities let you modify them to your specific needs. You can quickly identify flash performance trends and optimize resources for improved application performance.

Enterprise-Grade Flash

To enable superior long-term performance and scalable, sub-millisecond response times – even at the petabyte scale – Hitachi offers its own brand of flash modules (FMD DC2 and FMD HD). The FMD line delivers superior real application performance at lower latency, improved efficiency with inline compression, and a higher resiliency than other offerings. These flash modules use specially designed flash controllers that are up to five times faster than off-the-shelf solid-state disks (SSDs), so applications run faster and are less likely to slow down, even as workload I/O increases. The FMD’s 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: up to 40PB effective capacity.

Optimized Storage for Virtualized Server Infrastructure

Hitachi Data Systems offers a wide range of plugins and adapters that enhance virtual server infrastructure performance and administrator productivity. SVOS features integration of VMware applications (including VAAI, VASA, VAMP, VADP, SRA, VVOL) and Microsoft Windows® 2012 applications (including VSS, ODX). This integration offloads storage-intensive tasks from hosts to increase virtual machine density, improve performance and reduce workload contention.

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. All VSP family systems use the same operating system, network file services, management and data protection services, 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 farther 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.

Hitachi Data Systems

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7 Based on typical 2:1 compression