

FORM VIRTUALIZATION ECONOMICS FLEXIBILITY INNOVATE
INFORMATION GLOBAL CHANGE INTELLIGENT TECHNOLOGY
SIGHT OPPORTUNITY SOCIAL INFRASTRUCTURE INTEGRATION



Hitachi Virtual Storage Platform

Unified. Enterprise. Accelerated.

As businesses strive to innovate and prosper, the need to solve complicated data management issues has never been greater. Organizations of all sizes are hampered by data growth demands, rising costs and complexities, and difficulties meeting service level agreements. While data capacity, applications and virtual server environments are growing at exponential rates, budgets are not. Data centers must become more efficient and simpler to adeptly meet these challenges.

And with the rampant rise in unstructured data storage requirements, traditionally separate file and block solutions are no longer adequate for meeting business cost-efficiency goals. Savvy IT leaders are looking to unified storage platforms as a way to infuse overburdened data centers with greater flexibility, investment protection and cost savings.

Hitachi Virtual Storage Platform

Hitachi Virtual Storage Platform (VSP) is the only enterprise-class unified storage for all data that helps businesses satisfy their growth requirements without compromise. VSP is the only system that can centrally consolidate file, block and object data (with Hitachi Content Platform) and storage from other vendors, to redefine unified storage for the future.

It optimizes support for critical applications, cloud-ready infrastructure and data center consolidations, all through a single intuitive interface.

VSP is not just unified storage. It delivers on the Hitachi Data Systems vision of an integrated portfolio of storage solutions, coordinated with intelligent and uniform management, to unify the storage environment, making it highly scalable, efficient and reliable.

VSP provides a leading scalability that extends investments further. Internal capacity of a single system can grow to more than 3PB while performance can increase linearly in excess of 1,000,000 transactions per second. With external storage virtualization, VSP can scale to an industry-leading 255PB of total storage. Scale the capacity of data sets with megaLUNs up to 128TB and file systems up to 256TB. Take thousands of point-in-time snapshots for finer granularity of recovery. Remotely copy all data without limits.

Virtual Storage Platform is a powerful and cost-effective storage solution for data retention and business continuity. With the majority of the Fortune 500® companies as our customers, Hitachi Data Systems has the experience and technology to meet the storage challenges of large and small enterprises. Complemented by professional services from Hitachi Data Systems, VSP is the most complete enterprise storage offering available.

Flash Accelerated Virtualization and Reduced Storage Costs

Hitachi Virtual Storage Platform is designed for organizations that seek to accelerate the performance of their business applications. VSP incorporates a flash acceleration software enhancement that speeds flash device I/O throughput, integrated Hitachi Accelerated Flash, and enterprise storage virtualization. It delivers faster access to information and increased efficiency through central management of all storage assets. Database, analytics, virtual desktop, virtualized server environments and mainframe benefit from its superior performance and improved response times.

Flash technology has become more pervasive in the data center over the past few years as IT practitioners seek to provide the competitive business advantages of real-time computing. However, its widespread adoption as a mainstream storage option has been hampered by high costs, limited endurance and sub-optimal write performance. IT organizations have been forced to make tradeoffs in performance, capacity and functionality to reach the cost points that their shrinking budgets can accommodate. Hitachi Accelerated Flash fundamentally changes this model by eliminating these tradeoffs and answering demands for high capacity, performance and advanced functionality with increased durability. Hitachi Accelerated Flash delivers the performance, cost points, capacity and environmental characteristics that alternative solid-state storage options cannot match.

Hitachi Accelerated Flash features the new flash module built specifically for the most demanding enterprise-class workloads. It employs innovative Hitachi-developed embedded flash memory controller technology. And, it is designed to achieve higher performance, increased durability and greater capacity compared to the commodity solid-state drives found in competitive systems.

Meet These Challenges With 3-D Scaling

3-D scaling gives you optimal infrastructure growth in all dimensions.

Scale up to meet increasing demands by dynamically adding processors, connectivity and capacity in a single unit. This gives you optimal performance for open systems and mainframe environments.

- Proven scalability that outperforms other enterprise-class systems, powered by 192GB/sec aggregate internal bandwidth, the system delivers more than 1,000,000 transactions per second and is the highest performing storage system per the Storage Performance Council.¹
- Rack-mountable design that can be used as a diskless virtualization controller; can grow its storage up to 2,048 SAS 2.5 in. drives or 1,280 SATA 3.5 in. drives, and can support up to 192 flash module drives for exceptional performance.
- Unmatched multiplatform connectivity with up to 192 Fibre Channel 8Gb/sec host ports or 192 IBM® FICON® 8Gb/sec host ports or 96 Fibre Channel over Ethernet (FCoE) 10Gb/sec host port and network attached storage (NAS) gateways.

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¹ http://www.storageperformance.org/results/benchmark_results_spc1/#spc1

ADVANCED BLOCK AND HITACHI NAS PLATFORM UPGRADE OPTIONS

Unified Storage	Up to 4 high-performance file modules consolidate all file systems under a single namespace. Scales LUNs to 128TB and file systems pools to 256TB.
Unified Software	Includes multiprotocol file services, file data deduplication, intelligent file tiering, file virtualization and unified directory structure.
VMware Integration	Hitachi NAS Virtual Infrastructure Integrator provides complete unified data management services for VMware vCenter.
Optimization Software	Use of automatic and proactive tiering, data mobility and alignment with business applications helps lower costs and improve return on investment for maximum efficiency.
Intelligence Software	Establishes service level objectives by business application, including metrics like capacity, response time, IOPS and data transfer rates, plus reports for showback and chargeback accounting.
Analysis Software	Discovers, correlates, analyzes and provides root cause, delivering insights to improve performance and asset utilization as well as problem avoidance.
Protect Software	Supports in-system and remote replication, snapshots, backups and application-consistent restores, reduces risk, provides the foundation for business continuity, and ensures high availability.

■ Hardware-accelerated network protocols in Hitachi NAS Platform, which support up to 2GB/sec throughput for sequential workloads and up to 140,000 IOPS per node (per SPECsfs_2008 NFS benchmark).

Scale out to meet business demands by dynamically combining multiple units into a single logical system with shared resources and clustered nodes. Support increased needs in virtualized server environments and ensure safe multitenancy and quality of service (QoS) through partitioning of cache and ports.

- Up to 8 virtual storage directors and 1TB single image global cache.
- Powered by our 5th-generation crossbar switch architecture that joins multiple control chassis under one logical system.
- Up to 4 Hitachi NAS Platform nodes per cluster and up to 16PB usable capacity, 256TB file system pools, large single namespace up to maximum capacity, and up to 60,000 concurrent users.

Scale deep to extend the advanced functions of Hitachi Virtual Storage Platform to multi-vendor storage through virtualization. Offload less-critical data to external tiers in order to optimize the availability of the Tier 1 resources.

- Virtualization of internal and externally attached storage from Hitachi, EMC, IBM, Sun and other manufacturers, supporting up to 255PB under management.
- Multitenancy support enabled by virtual port, cache partitioning, resource group access control and volume ownership management.

Hitachi Virtual Storage Platform Highlights

- **Data mobility** functions enable rapid transfer of data to new storage with host-transparent migration. Reduce operational risks with advanced data replication topologies.
- **Unmatched efficiency** features yield the highest capacity available in the least space.
 - Primary data deduplication using hardware-based SHA-256 calculation engines provides high performance and up to 90% capacity savings depending on data types. Auto-throttling of the dedupe process enables uncompromised performance during high file sharing workload periods.
 - Unlimited file clones are available to enable writable snapshots while efficiently using capacity.

»»» INNOVATE WITH INFORMATION™

www.hds.com/innovate

Innovation is the engine of change, and information is its fuel. Innovate intelligently to lead your market, grow your company, and change the world. Manage your information with Hitachi Data Systems.

- High-density block storage design holds 2,048 drives in six 19 in. standard racks.
- Single-image global cache is accessible across all virtual storage directors for maximum performance.
- Automated wide-striping of data allows pool balancing and lets volume grow or shrink dynamically.
- Latest rack-optimized Hitachi Accelerated Flash module drive and 2.5 in. 6Gb/sec SAS drives allow lower power consumption and higher density per rack.
- Hitachi Command Suite enables faster and simpler management across file and block workloads.
- **Hitachi Dynamic Tiering** software automates data placement for higher performance and lower cost. It manages internal and external data, including multivendor and mainframe data. Its pools place the right data in the right place at the right time with no performance degradation. Hitachi Tiered Storage Manager controls the automated behavior of Dynamic Tiering through the use of standard, custom policies and profiles.
 - Supports automated page-level placement according to user-defined policies across internal and external storage tiers, including multivendor systems.
- **Intelligent file tiering** and automated migration enables dynamic policy-based hierarchical storage management (HSM).

■ **Server virtualization** integration with leading virtual server platforms gives you end-to-end visibility from an individual virtual machine to the storage logical unit and protects large-scale multivendor environments.

- Integration with VMware vStorage APIs for Array Integration (VAAI) enables: hardware-assisted locking for improved protection of VMware Virtual Machine File System (VMFS) cluster file system metadata, full copies executed on the storage system to offload VMware vSphere host processor cycles, and array-based block zeroing for accelerated deployment of large-scale virtual machines.
- Integration of VMware vCenter Site Recovery Manager automates business continuity and protection.
- Integration with Microsoft® Virtual Shadow Copy Service (VSS) enhances data protection.

■ **Sustainable design** is highlighted by certification as a Super Eco-Product.

- 40% better capacity per square foot and lower power consumption compared to the Hitachi Universal Storage Platform V.
- Transparent space reclamation of existing allocated storage.

■ **Data resilience** is supported with integrated protection frameworks that work with any hypervisor as well as application-aware replication management, enhanced encryption and advanced security management.

- Up to 4 data center topologies.
- Storage-based failover for active-active hypervisor site protection.
- Mainframe enhancements for virtual tiering, greater efficiency for all data types and operating systems, advanced data protection, and up to 40% better utilization.

Hitachi Data Systems Global Solution Services

Fully exploit the unparalleled capabilities of Hitachi Virtual Storage Platform. Consolidate and aggregate multivendor systems for simplified management. Control your entire storage universe through a single management console. Hitachi Data Systems Global Solution Services incorporates the industry's best people, products, tools and methodologies to make your IT environment more agile so you can reach your critical enterprise milestones and maximize your return on investment (ROI).

We apply consulting, transition, management, education and support services to leverage tiered storage pools, multiprotocol aggregation and single point-of-management capabilities to solve your IT challenges.

Our consultants can help you plan and design, install and implement, transition and integrate, and manage and optimize storage infrastructure solutions that meet your needs.

GSS offers a range of service capabilities for Hitachi Virtual Storage Platform in the following areas:

- Storage Economics Strategy Services
- Risk Analysis Workshops
- Storage Virtualization and Tiered Storage Services
- Backup Assessment Services
- Implementation Services for Storage Management Products
- Implementation Services for Hitachi Replication Products
- Data Migration and Nondisruptive Migration Services
- Storage Consolidation Services
- Remote Tuning Services
- Mainframe Services

Why Invest in Hitachi Storage?

For more than 20 years Hitachi Data Systems has led the field in enterprise storage systems. Advanced design, a reputation for reliability and flexibility ensure that Hitachi Virtual Storage Platform extends the legacy of the renowned Hitachi Universal Storage Platform family. The ease of management and efficiencies of having all types of data managed by a single system should not be underestimated. VSP offers superb value to the data center.

For More Information

For more information on how to unify your storage without compromise using Hitachi Virtual Storage Platform, please visit www.HDS.com.

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