

Hitachi Adaptable Modular Storage and Workgroup Modular Storage

Modular Hitachi Storage Delivers Enterprise-level Benefits



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Organizations of all sizes now confront storage challenges faced by the largest enterprises—escalating data growth, application performance and availability, business continuity, shortened backup windows and complex, difficult-to-manage storage infrastructures. They must meet these challenges not with enterprise-sized resources, but rather within the constraints of limited budget, staff and data center space.

With many years of experience serving FORTUNE 500® companies, Hitachi Data Systems understands these challenges. It has developed Services Oriented Storage Solutions that match application and business requirements to storage attributes. These proven solutions are built on a new set of modular, cost-effective product lines that deliver superior performance, availability and reliability, along with advanced storage management features previously unavailable to this market segment.

Hitachi Data Systems—Ready to Help Meet Enterprise-like Storage Challenges

As organizations seek competitive advantage and growth in their market spaces while trying to comply with regulatory requirements, they face many of the same data storage challenges and pain points as the world's largest enterprises:

- Data growth continues to accelerate.
- Old or obsolete storage devices are unreliable and perform poorly.
- IT budgets and head counts are flat or reduced.
- Hard-to-manage storage infrastructures—server-internal disks or server-attached storage from multiple vendors—drive management costs to several times the acquisition costs.
- Backup and restore windows are shrinking.
- Disaster recovery time objectives require that applications be recovered within hours or even minutes.
- Applications are not meeting performance and availability expectations.
- Compliance requirements and litigation fears demand that data be kept in tamper-proof storage for defined time periods and made available quickly when necessary.
- “Old” data needs to be online and accessible in short time periods (generally seconds or minutes).

That's why Hitachi Data Systems wants to provide organizations of all sizes with the availability, performance, reliability, manageability and surrounding services of storage systems traditionally reserved for very large enterprises. How is this possible if you have a limited budget, staff and data center space? Hitachi Data Systems offers two lines of modular storage scaled to fit your environment and budget. They serve as the foundation for its proven Services Oriented Storage Solutions that help align IT with your business objectives.

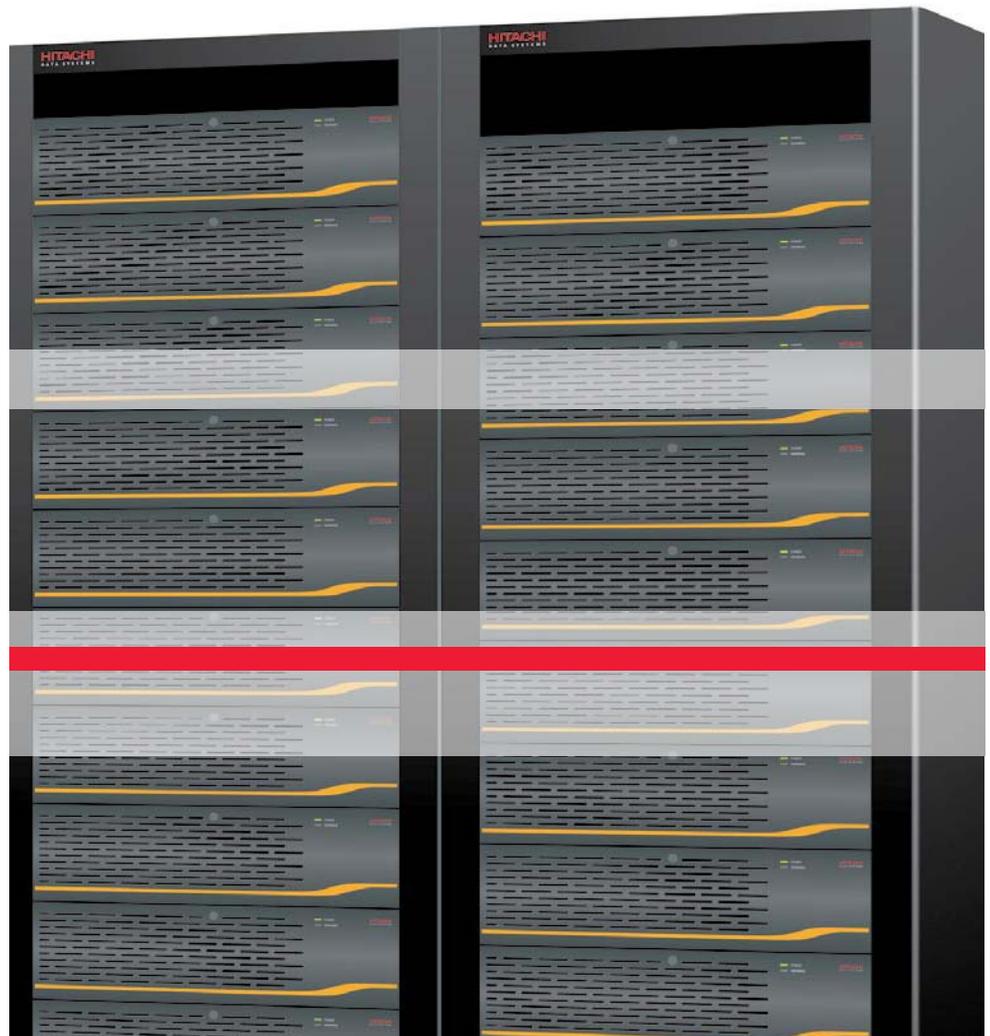
In addition, by leveraging the industry- and application-specific expertise of Hitachi TrueNorth™ Channel Partners, Hitachi Data Systems brings you the optimal solution for your organization. And it does so without compromising the legendary quality and reliability that make Hitachi storage systems the choice for more than half of the top 100 companies of the FORTUNE 500.

Systems Provide Enterprise-class Functionality without Compromising Quality and Reliability

Offering several unique features, Hitachi Adaptable Modular Storage and Workgroup Modular Storage provide the greatest scalability and flexibility of any modular storage line on the market. Systems include:

- Adaptable Modular Storage 1000
- Adaptable Modular Storage 500
- Adaptable Modular Storage 200
- Workgroup Modular Storage 100

These advanced modular storage systems are configured and managed from a “single pane of glass”—the easy-to-use, graphical user interface (GUI) of Hitachi Storage Management and HiCommand® Suite software.





Adaptable Modular Storage and Workgroup Modular Storage

Adaptable Modular Storage 1000, 500 and 200 systems are today's most scalable, high-performance, high-availability modular storage systems. All three models support native Fibre Channel storage area network (SAN), network attached storage (NAS) or Ethernet-attached iSCSI on high-performance Fibre Channel or cost-efficient SATA intermix drives. The Adaptable Modular Storage 1000 supports any two protocols. The other models support dual iSCSI and Fibre Channel host connections. All of these models also support RAID-6 disk configurations, for even higher availability.

Workgroup Modular Storage 100 is ideal for small to midsized organizations that require the best in scalability and performance in a small footprint. This system supports cost-efficient SATA drives while maintaining the reliability edge that world-class Hitachi engineering delivers.

Adaptable Modular Storage and Workgroup Modular Storage systems complement the Hitachi Universal Storage Platform™ V and the Hitachi Universal Storage Platform VM

models in tiered storage configurations, hosting data that has multiple performance and archiving requirements. Both Adaptable Modular Storage and Workgroup Modular Storage models support cache partitioning and logical-volume migration—unique innovations in the midrange market.

Power, Scalability, and Flexibility in Smaller, Modular Footprints for Small to Midsized Organizations

These modular systems equip Services Oriented Storage Solutions with many enterprise-level benefits—in smaller, modular footprints to meet many of an organization's business needs. For example:

- Cost-efficient storage solutions support any organization, from the small to midsized business or small to midsized enterprise (SMB/SME) to a “branch office” for a large data center deployment. They also support tiered storage configurations built on Universal Storage Platform V or Universal Storage Platform VM models. All Adaptable Modular Storage models offer three tiers of storage in a single rack: 15,000RPM Fibre Channel, 10,000RPM Fibre Channel, or

7,200RPM SATA. The Adaptable Modular Storage 200 and 500 systems can both be field-upgraded to larger Adaptable Modular Storage models.

- Advanced features improve the reliability and usability within any modular infrastructure or mission-critical operation, and for specific application workloads.
- Support for native Fibre Channel SAN, iSCSI or NAS configurations and a choice of Fibre Channel and SATA II disks allow administrators to match the application's performance to the cost of storage. The Adaptable Modular Storage 1000 offers a dual protocol, enabling the storage to be accessed via Ethernet (iSCSI or NAS) or Fibre Channel (SAN or direct). The other three models have an option for dual protocol connectivity that allows for both iSCSI and Fibre Channel host connectivity. All volumes are managed by the same set of software tools, making Adaptable Modular Storage and Workgroup Modular Storage perfect for consolidating any data. The other three models have an option for dual protocol connectivity that allows for both iSCSI and Fibre Channel host connectivity.
- Cache partitioning enhances application quality of service and prevents cache gridlock. Cache partitioning is included in all dual controller Adaptable Modular Storage and Workgroup Modular Storage models. Cache partitioning allows the storage administrator to allocate cache to a specific volume to meet the needs of any application. Cache partitions and segments can be expanded or retracted and cache partitions can be aligned to match RAID stripe sizes for efficient movement from cache to the disk drives. No other modular products offer such flexibility.
- Hitachi Modular Volume Migration software functionality enables nondisruptive movement of a volume within the storage device. Volumes can be moved from one RAID group to another across tiers of storage (SATA to Fibre Channel, Fibre Channel to SATA), from one RAID size to another, or between different RAID types (RAID-5 to RAID-6, RAID-6 to RAID-5), for example. Any volume can be moved while being

accessed; no volume re-mount is required. This gives the storage administrator a very powerful tool to manage data.

- Hitachi Power Savings can be integrated into backup and archiving applications that store data on any Adaptable Modular Storage or Workgroup Modular Storage model. Power Savings allows selected RAID groups of disk drives to be powered down when no host I/O activity takes place. This feature can yield significant savings in energy costs.
- Hitachi TrueCopy® Extended Distance software supports cost-effective, long-distance asynchronous remote replication of data between Adaptable Modular Storage 500 and 1000 models—enterprise-class remote data replication between sites. This enhances the recoverability of data by shrinking recovery time and recovery point objectives without increasing network costs for long-distance replication.
- Hitachi TrueCopy Synchronous software for all Adaptable Modular Storage and Workgroup Modular Storage models enables the Adaptable Modular Storage 200 and Workgroup Modular Storage 100 to offer synchronous remote data replication between sites. This powerful feature is even cost-effective for small businesses. The Adaptable Modular Storage 200 and Workgroup Modular Storage 100 now make great second-site systems for offsite backup and archive.
- “Single pane of glass” management of all Hitachi storage is accomplished via Hitachi Storage Management and HiCommand Suite software, which enables the centralized management of large and complex storage networks via an integrated set of utilities. Smaller companies can use the powerful but easy-to-use Hitachi Resource Manager™ utility package and its Storage Navigator program.
- “Secured” management of Adaptable Modular Storage and Workgroup Modular Storage is delivered via Role-based Access and Audit Logging. For large environments where storage is shared across multiple groups, managing access and changes via

secured, role-based access with the ability to undo incorrect configuration changes is crucial to maintaining data access and performance.

- The Plug-and-play SAN Kit for Hitachi Modular Storage supports Microsoft® Simple SAN. It enables provisioning of Adaptable Modular Storage and Workgroup Modular Storage models from a very easy-to-use GUI. Small companies using Microsoft Windows 2003 can run their entire storage network from a few screens using the kit, which includes Microsoft Windows—Hitachi Virtual Disk Service integrated with QLogic's SAN Surfer Express. The entire kit can be installed by a novice in under one hour by following included instructions.
- Redundant, hot-swappable components and Hi-Track® Monitor support maximum uptime. All dual controller Adaptable Modular Storage and Workgroup Modular Storage models offer full redundancy. Volumes can be attached to a server through two ports on separate controllers, ensuring access to data in the event of any component failure.

Adaptable Modular Storage 1000, 500 and 200 Systems

Features and functions clearly address the needs of any business, from small to midsized to large organizations:

- **Field upgradeability.** Upgrade from the Adaptable Modular Storage 200 to the 500 system with over 160 terabytes (TB) of SATA and Fibre Channel storage capacity. Upgrade from the Adaptable Modular Storage 500 to the 1000 system with over 320TB of capacity.
- **Fibre Channel, NAS and iSCSI support.** This support allows IP-based volumes to be managed with the same tools as SAN volumes, reducing management overhead and improving usability. The Adaptable Modular Storage 1000 offers dual protocol (any two) support. The other models have an option for dual protocol connectivity that allows for both iSCSI and Fibre Channel host connectivity.

Hitachi Data Systems Global Solution Services—at Your Service

Hitachi Data Systems Global Solution Services, often working with Hitachi TrueNorth™ Channel Partners, offers professional services for planning, design and deployment of solutions across the spectrum of organizations.

Global Solution Services teams combine the industry's best people, products and methodologies to provide architectural analysis, configuration planning and enterprise assessment. They ensure that organizations maximize their storage investments and meet their business objectives.

For information on services to help meet regulatory compliance requirements, protect data, reduce total cost of ownership or develop a disaster recovery plan, contact your Hitachi Data Systems representative or go to www.hds.com.





- **Cache partitioning.** More efficiently allocate cache to specific applications, optimizing their performance. Multiple partitions (2 partitions to 8 partitions in the 200 system, 2 partitions to 16 partitions in 500 system, and 2 partitions to 32 partitions in 1000 system) allow ultimate flexibility in meeting the performance needs of any application.
- **RAID-6 dual parity striping.** Employ RAID-6 for more reliable rebuild in the rare event of a disk drive failure. RAID-6 is over 1,300 times less likely to incur data loss due to hard disk drive (HDD) failure than RAID-5. RAID-6 enables the storage administrator to choose a convenient time to perform a RAID group rebuild after a failure. With dual parity, there is no exposure to a second HDD failure.
- **Logical Unit Migration software.** Enable volumes to be moved from one RAID group to another with this software without impacting the application server.
- **SATA and Fibre Channel disk drive intermix** (with Adaptable Modular Storage models). Take advantage of the intermix capability to host any workload on the most economical storage system.

All-SATA Workgroup Modular Storage 100—Cost-effective for Even the Smallest Organizations

The Workgroup Modular Storage 100 system is the choice for applications requiring functional SATA storage with high performance, availability and reliability for Fibre Channel, iSCSI-attached storage or NAS. It is also excellent for applications lending themselves to modular workloads, especially where SATA is a very good fit. These include:

- SMB/SME applications with performance characteristics suitable for cost-effective SATA storage
- Enabling first SANs for Microsoft Simple SAN environments and allowing cost-effective storage consolidation; Plug-and-play SAN Kits offering Fibre Channel or Ethernet (iSCSI) connectivity are available
- Fibre Channel, NAS and iSCSI support. This support allows IP-based volumes to be managed with the same tools as SAN volumes, reducing management overhead and improving usability. The Workgroup Modular Storage 100 has an option for dual protocol connectivity that allows for both iSCSI and Fibre Channel host connectivity.

- Long-term storage or archive data where SATA storage is more cost-effective than tape
- Tier II or Tier III storage when used with a Universal Storage Platform V or a Universal Storage Platform VM model
- Video- or media-streaming applications that require cost-effective but highly available storage

Services Oriented Storage Solutions for Adaptable Modular Storage and Workgroup Modular Storage

How do Hitachi modular storage systems help storage administrators gain control over the bigger picture? With Adaptable Modular Storage and Workgroup Modular Storage systems, administrators can:

- Reduce storage management complexity, cost and risk by using tiered storage infrastructures with the highest modular storage performance available. Adaptable Modular Storage supports three tiers in a single system: high-performance 15,000RPM Fibre Channel drives, midlevel-performance 10,000RPM Fibre Channel drives and cost-effective 7,200RPM SATA drives.
- Simplify the storage environment with easy-to-use software utilities for configuration and management. The Resource Manager utility package provides all of the functionality needed to manage even the most complex environments with a user-friendly GUI.
- Deliver application-specific performance, availability and protection across systems—from a few terabytes to more than 320TB. Adaptable Modular Storage systems offer the best performance, scalability and flexibility of any modular product on the market.

- Offer more cost-effective options for increased data protection and disaster recovery than any other storage in the midrange category. Hitachi TrueCopy software enables cost-effective long-distance replication between models.
- Enable a complete data lifecycle management solution that allows administrators to deploy the right class of storage and to match it to application requirements. Hitachi Data Retention Utility enables volume locking for secure archival of any data.
- Enhance availability and reliability for more uptime with fewer outages, both planned and unplanned. None of the dual controller Adaptable Modular Storage models has a single point of failure. When combined with RAID-6, these storage systems are many thousands of times more reliable (no data loss) than competitive systems using RAID-5.
- Scale as business grows from under a few terabytes to 324TB. The Adaptable Modular Storage 200 system can be upgraded “in place” to an Adaptable Modular Storage 500 or 1000 system.
- Deploy easy-to-manage Microsoft Simple SAN storage platforms, providing support for Microsoft Windows servers seamlessly, by using the Plug-and-play SAN Kit for Hitachi Modular Storage. These kits can be installed and made operational within minutes, allowing storage to be provisioned directly from Windows.
- Allow hot-swapping of virtually every component, ensuring continuous availability. Systems can be upgraded from the Adaptable Modular Storage 200 to the 500 to the 1000 systems. This ensures that an organization will never outgrow Adaptable Modular Storage.

- Benefit from seamless integration via Hitachi HiCommand Tiered Storage Manager software between Universal Storage Platform V or Universal Storage Platform VM and any of the modular models. Adaptable Modular Storage and Workgroup Modular Storage systems are perfect for reliable, cost-effective tiered storage when used with Universal Storage Platform V or Universal Storage Platform VM models.

Services Oriented Storage Solutions

Applications and the storage environments they depend upon have become critical drivers of the business processes and decisions that impact organizational growth, risk and profitability. That’s why it’s imperative that businesses more closely align storage infrastructure with application needs.

Services Oriented Storage Solutions from Hitachi Data Systems answer this business challenge by enabling organizations to precisely match application requirements to storage attributes such as performance, availability, cost and functionality.

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OB-004-G DG November 2007