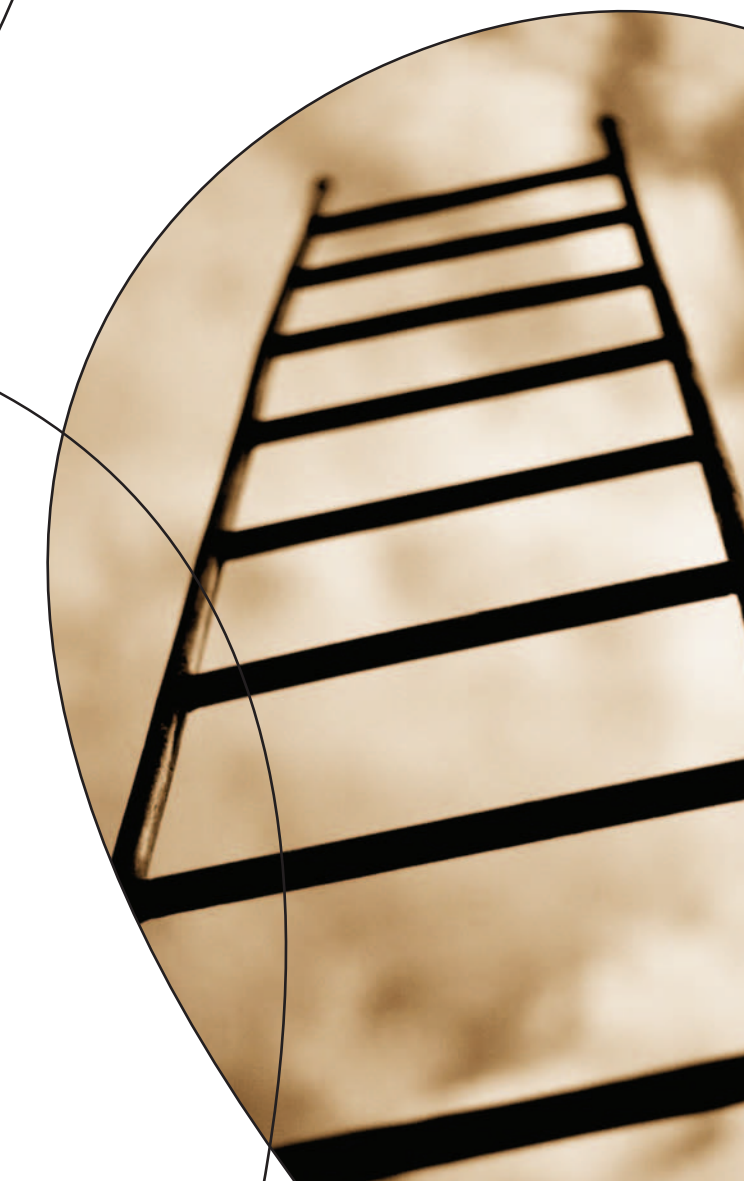




HITACHI
DATA SYSTEMS

Hitachi TagmaStore™
Network Storage Controller,
Adaptable Modular Storage, and
Workgroup Modular Storage
Modular Storage for the Midrange Market

Partner Beyond Technology





Hitachi TagmaStore™ Modular Storage for the Midrange Market

Small- and medium-sized businesses (SMBs) face storage challenges much like larger enterprises, but with reduced budget, staff, and data center space. For these customers, Hitachi Data Systems offers Application Optimized Storage™ solutions built on new, modular, cost-effective storage systems with management capabilities previously not available to the midrange market.

Storage Challenges Faced by SMBs

As SMBs seek to gain competitive advantage and grow in their respective markets while also trying to comply with regulatory requirements, they are facing many of the same data storage challenges and pain points as large enterprises:

- ∴ Data growth is continuously accelerating.
- ∴ Applications are not meeting performance and availability expectations.
- ∴ Backup and restore windows are shrinking.
- ∴ Compliance requirements and litigation fears demand that data be kept in tamperproof 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).
- ∴ Business continuity objectives require that applications must be recovered in minutes or hours.
- ∴ Inexpensive storage devices are unreliable and perform poorly.

- ∴ IT budgets and head counts are flat or shrinking.
- ∴ Hard-to-manage storage infrastructure, often from multiple vendors, drives management cost to several times the acquisition cost.

Application Optimized Storage™ Solutions Scaled for SMBs

With many years of experience successfully serving Fortune 500 companies, Hitachi Data Systems understands the storage challenges SMBs face and recognizes their limited budget, staff, and data center space. Hitachi Data Systems offers three new midrange modular lines, scaled to fit the SMBs' environment and budget, yet featuring many enterprise-level capabilities, to serve as the foundation for Application Optimized Storage solutions. These solutions match application requirements to storage attributes and help align IT with business objectives, while simplifying storage infrastructures, streamlining administration, and reducing costs. Further, by leveraging the industry and application-specific expertise of Hitachi TrueNorth™ Channel partners, Hitachi Data Systems brings you the optimal solution for your business.

Three Flexible, Scalable Lines Provide Unparalleled Choice for SMB Customers

Hitachi Data Systems brings enterprise-level capabilities, not previously available in the midrange market, to SMB customers in three flexible, powerful, highly scalable, and highly reliable modular storage lines.

Hitachi TagmaStore™ Network Storage Controller Model NSC55

- ∴ Delivers all of the unique virtualization, logical partitioning, and universal replication of the Hitachi TagmaStore Universal Storage Platform in a scaled-down modular package for midsize business.

Hitachi TagmaStore Adaptable Modular Storage Models AMS200 and AMS500

- ∴ Deliver the best price and performance in their class for superior support of Microsoft, ERP/CRM, database, and backup and data protection applications in standalone or tiered storage environments in midsize businesses.

Hitachi TagmaStore Workgroup Modular Storage Model WMS100

- ∴ Delivers the fastest, most reliable SATA-based storage area network (SAN) storage for SMBs and workgroups.

Network Storage Controller Model NSC55

Powered by the Hitachi Universal Star Network™ crossbar architecture, Network Storage Controller model NSC55 offers the unique virtualization, logical partitioning, and universal replication capabilities of the Universal Storage Platform in a rackmounted, modular form factor, priced well within reach of the mid-sized enterprise. Just as large enterprises are leveraging the Universal Storage Platform to think differently about storage, the NSC55 will enable mid-sized businesses to manage their storage infrastructures in ways never possible before.

- ∴ *Aggregation and Virtualization.* Manage as much as 16PB of virtualized internal and external storage to reduce complexity and maximize usage of existing resources, including storage systems from Hitachi, Sun, IBM and EMC.
- ∴ *Consolidation.* Reduce the number of storage systems in open and/or mainframe environments, maximize storage utilization, improve storage administrators' productivity, and bring SANs and network attached storage (NAS) under one storage and management umbrella.

- ❖ **Tiered Storage Deployment.** Benefit from the economy of solutions that match application requirements and value of data to the right class of storage and move data dynamically and nondisruptively between storage tiers as needed.
- ❖ **Scalability and Performance.** Meet application service level agreements (SLAs) in open systems and mainframe environments, and provide unequalled capacity and configuration flexibility compared to traditional midrange storage.
- ❖ **Application Quality of Service (QoS).** Create as many as eight logical partitions and dedicate storage resources to ensure application performance and availability.
- ❖ **Business Continuity.** Leverage universal replication to create a single infrastructure for local and remote replication, backup, or disaster recovery across heterogeneous storage systems—all managed by a single set of software tools and consistent policies, processes, and procedures.
- ❖ **Lower Total Cost of Ownership (TCO).** Maximize storage utilization, centralize management of heterogeneous externally attached storage, improve storage administrators' productivity, extend the lifespan of existing storage systems, and decrease the cost of mainframe data archival.

Adaptable Modular Storage Models AMS200 and AMS500

Designed for SMBs that need enterprise-quality storage management capabilities but do not need large-scale virtualization, the Adaptable Modular Storage models AMS200 and AMS500 offer excellent cost-efficient platforms in a modular footprint. With support for both SATA and Fibre Channel drives, these systems can be deployed as part of a tiered infrastructure, in a SAN, or even as tiered storage "in a box."

- ❖ **Scalability and Performance.** Provide unequalled application-specific performance and capacity that scales beyond 80TB.
- ❖ **Consolidation.** Reduce the number of storage systems, maximize storage utilization, improve storage administrators' productivity, and lower management and environmental costs.
- ❖ **Application QoS.** Dedicate cache to specific applications and volumes to enhance performance.
- ❖ **Tiered Storage Deployment.** Benefit from the economy of solutions that match application requirements and value of data to the right class of storage.
- ❖ **Configuration Flexibility.** Host virtually any workload and multiple performance and archive requirements on the most economical storage system with SATA and Fibre Channel intermix; use also for disk-to-disk backup and tape replacement.
- ❖ **Ease of Management.** Simplify configuration and storage administration via easy-to-use graphical user interfaces.
- ❖ **High Availability and Reliability.** Leverage RAID-6 dual-parity striping to improve availability and speed RAID group rebuild times; maximize uptime with redundant hot-pluggable components and high-reliability Hitachi SATA implementation.
- ❖ **Business Continuity.** Leverage local and remote replication and backup software to shrink backup windows and expedite recovery from application failures.
- ❖ **Lower TCO.** Maximize storage utilization, centralize management of storage through consolidation, improve storage administrators' productivity, and reduce downtime.

Workgroup Modular Storage Model WMS100

Offering excellent scalability and performance, Workgroup Modular Storage model WMS100 leverages cost-effective SATA drives without compromising reliability and data integrity. The WMS100 can be quickly installed and configured to serve as the core storage system or for fast SAN deployment in small companies, or for data archive applications in tiered storage deployments at larger enterprises.

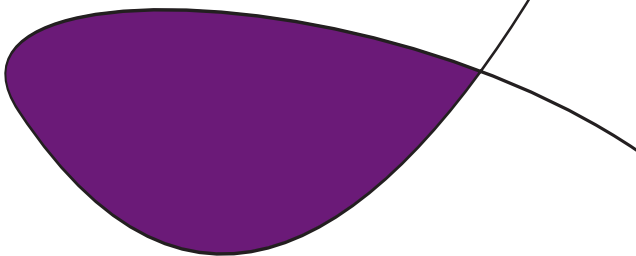
- ⚡ *Scalability and Performance.* Provide excellent performance and scalability beyond 40TB in a highly cost-effective SATA-based package for small companies.
- ⚡ *Consolidation.* Reduce the number of storage systems, maximize storage utilization, improve storage administrators' productivity, and lower management costs.
- ⚡ *Application QoS.* Dedicate cache to specific applications and volumes to enhance performance.
- ⚡ *Configuration Flexibility.* Dedicate to specific mission-critical applications, deploy as part of a first SAN in small enterprises, or integrate into a tiered storage infrastructure for archive, backup, or tape replacement in larger companies.
- ⚡ *Ease of Management.* Simplify configuration and storage administration through easy-to-use graphical user interfaces.
- ⚡ *High Availability and Reliability.* Leverage RAID-6 dual-parity striping to improve availability and speed RAID group rebuild times; maximize uptime with redundant hot-pluggable components and the high-reliability Hitachi SATA implementation.
- ⚡ *Business Continuity.* Leverage local and remote replication and backup software to shrink backup windows and expedite recovery from application failures.
- ⚡ *Lower TCO.* Maximize storage utilization, centralize management of storage through consolidation, improve storage administrators' productivity, and reduce downtime.

Hitachi Thunder 9585V™ Ultra High-end Modular Storage

For customers whose capacity needs exceed 88TB or who require more than 4 ports of Fibre Channel connectivity, the Thunder 9585V is a well-proven storage system that remains the fastest, most scalable modular system in the industry.

The Thunder 9585V:

- ⚡ Scales to 129TB of Fibre Channel or 173TB of Fibre Channel/SATA intermix of raw capacity
- ⚡ Provides 8 Fibre Channel ports; 1,024 virtual storage ports
- ⚡ Supports RAID levels 0 (Fibre Channel only), 1, 1+0, 5
- ⚡ Shares the same software as all other Hitachi storage



Technical Specifications

	Network Storage Controller Model NSC55	Adaptable Modular Storage Model AMS500	Adaptable Modular Storage Model AMS500
Architecture	Hitachi Universal Star Network™ crossbar switch, Global cache	Dual controller, Shared bus	Dual controller, Shared bus
Number of controllers	Shared global cache architecture	1 or 2	1 or 2
Data cache	4GB–64GB	2GB–8GB	1GB–4GB
Control memory	2GB–6GB	N/A	N/A
Maximum LUNs	16,384	2,048	512
Internal raw capacity	72TB Fibre Channel	88.5TB SATA intermix, 67.5TB Fibre Channel	40.5TB SATA intermix, 31.5TB Fibre Channel
Externally attached storage capacity	16PB	N/A	N/A
Internal disk drive options (Fibre Channel unless noted)	73GB (15K RPM), 146GB (10K RPM), 300GB (10K RPM)	73GB (10K RPM), 73GB (15K RPM), 146GB (10K RPM), 146GB (15K RPM), 300GB (10K RPM), 250GB SATA (7200 RPM), 400GB SATA (7200 RPM)	73GB (10K RPM), 146GB (10K RPM), 300GB (10K RPM), 250GB SATA (7200 RPM), 400GB SATA (7200 RPM)
Disk drive interface	Fibre Channel	SATA–Fibre Channel intermix	SATA–Fibre Channel intermix
Minimum–maximum number of disk drives	5–240 Fibre Channel	4–225 Fibre Channel, 0–210 SATA	4–105 Fibre Channel, 0–210 SATA
Model upgrade options	NO	NO	AMS500
RAID Support			
RAID-0	NO	YES (Fibre Channel only)	YES (Fibre Channel only)
RAID-1	YES (RAID-1+)	YES	YES
RAID-1+0	YES	YES	YES
RAID-5	YES	YES	YES
RAID-6	YES	YES	YES
Connectivity			
Maximum host connections	48 Fibre Channel, 16 FICON, 16 ESCON, 8 NAS	4 @ 1, 2, or 4 Gbit/sec Fibre Channel	4 @ 1 or 2 Gbit/sec Fibre Channel
Maximum attached hosts through virtual ports	1,024 per physical Fibre Channel port	512	512
Availability			
Nondisruptive component replacement	Major FRU	Major FRU	Major FRU
Nondisruptive hot-pluggable disks	YES	YES	YES
Nondisruptive microcode updates	YES	YES	YES
Hi-Track® “call-home” service/remote maintenance tool	YES	YES	YES
Cache binding	Hitachi Cache Residency Manager	Hitachi Cache Residency Manager	Hitachi Cache Residency Manager
Software			
Management software	Hitachi Resource Manager™ utility package, HiCommand® Suite	Hitachi Resource Manager™ utility package, HiCommand® Suite	Hitachi Resource Manager™ utility package, HiCommand® Suite
Virtualization of externally attached storage	Hitachi Universal Volume Manager	N/A	N/A
Logical partitioning	Hitachi Virtual Partition Manager 8 partitions (cache, ports, internal and externally attached capacity)	Cache Partition Manager 16 partitions (cache only)	Cache Partition Manager 8 partitions (cache only)
Remote copy	Hitachi TrueCopy™ Remote Replication (sync and async) and Hitachi Universal Replicator	Hitachi TrueCopy™ Remote Replication (sync)	N/A
Point-in-time copy	Hitachi ShadowImage™ In-System Replication, Hitachi Copy-on-Write Snapshot	Hitachi ShadowImage™ In-System Replication, Hitachi Copy-on-Write Snapshot	Hitachi ShadowImage™ In-System Replication, Hitachi Copy-on-Write Snapshot
Serverless disk copy and tape	Hitachi ShadowImage™ In-System Replication, Hitachi TrueCopy Remote Replication (sync and async), Hitachi Universal Replicator	Hitachi Cross-System Copy to/from Universal Storage Platform and Hitachi Lighting 9900™ V Series	Hitachi Cross-System Copy to/from Universal Storage Platform and Hitachi Lighting 9900™ V Series
Tiered storage management	HiCommand Tiered Storage Manager	N/A	N/A
Hot-spot eliminator	Hitachi Volume Migration	N/A	N/A
LUN security	Hitachi Volume Security	Hitachi Volume Security	Hitachi Volume Security
Host Storage Domains; multiple LUN/port; Virtual Storage Ports	YES	YES	YES
Disk-based WORM data protection	Hitachi Data Retention Utility	Hitachi Data Retention Utility	Hitachi Data Retention Utility
Dynamic LUN management	YES	YES	YES
Host failover	Hitachi Dynamic Link Manager™	Hitachi Dynamic Link Manager™	Hitachi Dynamic Link Manager™
Heterogeneous SAN management	Hitachi HiCommand Storage Services Manager, powered by AppIQ	Hitachi HiCommand Storage Services Manager, powered by AppIQ	Hitachi HiCommand Storage Services Manager, powered by AppIQ
Common APIs	Yes, across Hitachi storage systems	Yes, across Hitachi storage systems	Yes, across Hitachi storage systems

Universal Modular Storage Model AMS200	Workgroup Modular Storage Model WMS100
Controller, bus	Dual controller, Shared bus
	1 or 2
Cache	512MB–2GB
	N/A
	512
SATA intermix, Fibre Channel	42TB SATA
	N/A
15K RPM), 73GB (15K RPM), 10K RPM), 146GB (15K RPM), 10K RPM), SATA (7200 RPM), SATA (7200 RPM)	250GB SATA (7200 RPM), 400GB SATA (7200 RPM)
Fibre Channel intermix	SATA
Fibre Channel, 0–90 SATA	4–105 SATA
	NO
Fibre Channel only)	NO
	YES
	YES
	YES
	YES
2 Gbit/sec Fibre Channel	4 @ 1 or 2 Gbit/sec Fibre Channel
	512
FRU	Major FRU
	YES
	YES
	YES
Cache Residency Manager	Hitachi Cache Residency Manager
Resource Manager™ package, HiCommand® Suite	Hitachi Resource Manager™ utility package, HiCommand® Suite
	N/A
Partition Manager (cache only)	Cache Partition Manager 8 partitions (cache only)
	N/A
ShadowImage™ In-System Replication, Hitachi Copy-on-Write Snapshot	Hitachi ShadowImage™ In-System Replication, Hitachi Copy-on-Write Snapshot
Cross-System Copy to/from Universal Storage Platform and Hitachi Lighting 9900™ V Series	Hitachi Cross-System Copy to/from Universal Storage Platform and Hitachi Lighting 9900™ V Series
	N/A
	N/A
Volume Security	Hitachi Volume Security
	YES
Data Retention Utility	Hitachi Data Retention Utility
	YES
Dynamic Link Manager™	Hitachi Dynamic Link Manager™
HiCommand Storage Services Manager, powered by AppliQ	Hitachi HiCommand Storage Services Manager, powered by AppliQ
Access Hitachi storage systems	Yes, across Hitachi storage systems

Operating Systems Supported

Open Systems:

HP-UX

HP Tru64 UNIX

HP OpenVMS

IBM® AIX®

Microsoft Windows NT, Windows 2000 and Windows Server 2003

Novell NetWare

SGI IRIX

Sun Solaris

Linux

NetApp Data ONTAP, via HDS-NetApp® Enterprise NAS Gateway

IBM® z/OS, via Universal Storage Platform external attachment (AMS200, AMS500, WMS100; NSC55 support is direct)

VMware

Apple Mac OS (except NSC55)

Mainframe: (NSC only)

OS/390

MVS/ESA, MVS/XA

VOS, z/OS.e, z/VM, z/VSE

Red Hat Linux for S/390 and zSeries



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