

HITACHI
DATA SYSTEMS

Hitachi Lightning 9900™ V Series

Enterprise Storage Systems

Partner Beyond Technology





Hitachi Lightning 9900™ V Series

Exploit the power of intelligent storage for massive consolidation and to simplify management.

Simplify. Protect. Optimize.

Simplify Management with Massive Consolidation for Reduced TCO and Accelerated ROI

- :: Consolidate systems and pool storage resources
- :: Reduce licensing, maintenance, and environmental costs
- :: Scale nondisruptively to over 140TB
- :: Industry-leading performance driven by our second-generation Hi-Star™ crossbar switch architecture
- :: Maintain performance as capacity scales with over 15GB/sec aggregate internal system bandwidth
- :: Centralize management with the HiCommand® Storage Area Management (SAM) Suite—modular software based on industry standards
- :: Decrease infrastructure complexity with Virtual Storage Ports and Host Storage Domains
- :: Concurrent support for UNIX, Microsoft Windows NT, Windows 2000, Windows Server 2003, Linux, Novell NetWare, HP OpenVMS, IBM z/OS® and Transaction Processing Facility (TPF)

Protect Your Business Continuity and Provide High Availability to Your Operations—and Your Customers

- :: 100 percent data availability guarantee
- :: Global 24/7/forever availability
- :: Instant, user-defined point-in-time copies enable quick recovery from outages
- :: Nondisruptive, real-time copies for backups, application testing, and data warehousing/data mining
- :: Long-distance remote replication for offsite redundancy with complete data integrity

- :: Real-time data movement and online data migration over virtually unlimited distances
- :: Tapeless data vaulting and “serverless” disk copy and tape backup
- :: Use HiCopy cross-system copy software to move data between Lightning 9900 V Series and Thunder 9500 V Series storage systems
- :: Alternate path and clustering support and proven IBM GDPS support

Optimize Resources, Maximize Storage Utilization, and Improve Productivity

- :: Multidimensional scalability, including capacity, bandwidth, connectivity, workload mix, and embedded applications
- :: Simplified heterogeneous host access to dynamic storage pools
- :: Set-and-forget management—automate manual functions and improve productivity
- :: Maximize storage utilization with HiCommand SAM Suite
- :: Maintain performance levels with hot spot eliminator software
- :: Easy coexistence of SAN and NAS with HDS-NetApp® Enterprise NAS Gateway
- :: Complement with deployment of Hitachi Thunder 9500™ V Series modular storage systems to manage data across its life cycle

Maintain Peace of Mind—Exceptional Service and Support

- :: Surveys by FIND/SVP place Hitachi Data Systems Number One in overall service and support as well as in technical performance—two years in a row (2001-2002)
- :: Comprehensive professional services, ranging from strategic consulting to design, planning, and deployment, are available through Hitachi Data Systems Global Solution Services

Industry-leading Performance

Support Ongoing Productivity, Company-wide

- :: Second-generation, high-speed crossbar switch architecture
- :: Separate, redundant data and command paths
- :: High-throughput 10,000RPM and 15,000RPM dual-ported Fibre Channel disk drives
- :: 32 concurrent data transfers
- :: Fully addressable 128GB data cache; 6GB control cache for metadata
- :: Optional Hitachi FlashAccess™ cache residency manager software locks LUNs or LVs into cache
- :: Extremely fast and intelligent algorithms
- :: Flexible LUN support
- :: Hitachi CruiseControl™ hot spot eliminator software for automated performance tuning
- :: Support for Parallel Access Volumes (HPAV) and Multiple Allegiance (MA)
- :: Priority Access/port throttling provides guaranteed quality of service (QoS), maximum control
- :: Power to speed up complex decision-support queries and provide real-time analysis of customer behavior

No Downtime Worries

Open for Business—24/7 Access to Data

Your Hitachi storage is always available, always up.

- :: No single point of failure—redundant, hot-swappable components
- :: Global dynamic hot sparing
- :: Mirrored write cache with battery backup
- :: Nondisruptive microcode upgrades
- :: RAID-1+ and RAID-5 support
- :: Hi-Track® “call-home” service/remote maintenance tool

Ideal for Networked Infrastructures

Extensive Connectivity

Enjoy freedom of choice as you implement your infrastructure strategy.

- :: Fibre Channel, iSCSI, FICON, and ESCON enable integration for SANs and z/OS systems
- :: Virtual storage ports combined with Host Storage Domains deliver nearly unlimited, secure heterogeneous open systems connectivity

Hitachi Storage Software for the Lightning 9900 V Series

Our Powerful Software Solutions Are Made for Business

Employ our comprehensive software suites for additional power and flexibility to seamlessly support your business objectives.

- :: Business Continuity
 - :: Data Replication
 - :: Backup and Recovery
 - :: Data Movement
- :: Storage Area Management
 - :: HiCommand SAM
 - :: Performance Enhancement

Automate Storage Management and Gain New Levels of Control

Our HiCommand SAM Suite is based on industry standards and designed to reduce storage management complexity and costs.

- :: Apply policy-based automation
 - :: Reduces operational errors
 - :: Maximizes availability
 - :: Optimizes storage management
- :: Control a broad set of heterogeneous storage devices from any location
- :: Leverage application-centric view of storage to meet business unit's service levels and maximize storage utilization
- :: Improve the productivity of storage administrators through consistent, easy-to-use interfaces and automated procedures

Extensive Platform Support

Open Systems

- :: Sun Solaris
- :: Microsoft Windows NT
- :: Microsoft Windows 2000
- :: Microsoft Windows Server 2003
- :: IBM AIX
- :: HP-UX
- :: IBM DYNIX/ptx
- :: SGI IRIX
- :: Novell NetWare
- :: HP Tru64 UNIX
- :: SuSE Linux
- :: NetApp Data ONTAP
- :: Red Hat Linux
- :: HP OpenVMS

Mainframe

- :: z/OS®
- :: OS/390®
- :: MVS/ESA
- :: MVS/XA
- :: TPF/MPLF
- :: VM/ESA
- :: VM/XA
- :: VM/HPO
- :: VSE/ESA
- :: VSE/SP(4.1)
- :: TPF
- :: Linux for zSeries

Available in Flexible Configurations for Deployment to Meet Your Requirements

Lightning 9900 V Series systems are made for massive consolidation

Employ our comprehensive software suites for additional power and flexibility to seamlessly support your business objectives.

- :: The Lightning 9970V™ system offers you all the high-speed, high-availability characteristics of our advanced series in a small footprint—deploy for truly manageable SAN strategies
- :: Implement for disaster recovery assurance
- :: Utilize for company-wide information sharing
- :: The Lightning 9980V™ system enables you to consolidate vast amounts of storage across open systems and mainframe servers
- :: Form centralized host group pools
- :: Replace several systems with one to simplify and save
- :: Reduce management tasks, improve productivity, lower operational costs

Global Solution Services

Hitachi Data Systems Global Solution Services (GSS) has a collaborative business model and the experience to team our storage systems with the networked storage products that best optimize and enable continuous access to your critical information. GSS employs a building-blocks methodology to rapidly provide whatever level of assistance you require—from quick-start services for products to full business solutions. Our solutions integrate scalable, cost-efficient storage infrastructures with your business processes to solve industry-specific problems.

Technical Specifications

	Lightning 9980V	Lightning 9970V
System Capacity		
Number of disk drives (with spares)	5 to 1024	5 to 128
Disk capacity (GB)		
10,000RPM	73	73
15,000RPM	73	73
10,00RPM	146	146
Total raw capacity per system (w/146GB)	147.5TB	17.5TB
Maximum usable capacity for RAID-5 (7+1)		
Open systems	127.8TB	15.TB
z/OS®-compatible	119TB	14.1TB
Maximum usable capacity for RAID-1+		
Open systems	73TB	8.9TB
z/OS-compatible	63.5TB	7.7TB
Maximum number of RAID groups/system	254 (with 8 spares)	31(with 4 spares)
Data Cache		
Maximum	128GB	64GB
Minimum	4GB	2GB
Increments	4GB	2GB
Control Memory		
Maximum	6GB	6GB
Minimum	2GB	2GB
Logical Device Support	Up to 8,192	Up to 8,192
Control Frame		
Client-Host Channel Adapters (CHAS)		
Number of CHIP pairs	Up to 4	Up to 3
Simultaneous data transfers per CHIP pair	8	8
Physical interfaces per CHIP pair	8	8
Physical Interfaces per System		
Maximum	64	48
FICON	32	24
Extended Serial Adapters™ ¹ /ESCON	48	32
Fibre Channel (fiber-optic cable)	64	48
Interface Speed (Fibre Channel)	2Gb/sec	2Gb/sec
Maximum Virtual Storage Ports	8,192	6,144
Logical Paths per System		
Extended Serial Adapters	Up to 8,192	Up to 6,144
Array Control Processor (ACP)		
Number of ACP pairs per system	Up to 4	1 or 2 ²
Physical array paths per ACP pair	8	8
Maximum disks per array path	64	32
To cache	8	8
To disk array	8	8
Transfer rate		
Per disk array path	Up to 100MB/sec	Up to 100MB/sec
Per ACP pair (to cache)	Up to 800MB/sec	Up to 800MB/sec
Hi-Star™ Crossbar Switch Architecture		
Aggregate bandwidth (data)	10.6GB/sec	5.3GB/sec
Aggregate bandwidth (control)	5.3GB/sec	2.6GB/sec
Array Frame		
Array frames per system	Up to 4	N/A
Spare drives per system (standard) per drive RPM installed	1	1
Spare drives per system (maximum)	16	4

	Lightning 9980V	Lightning 9970V
Physical Specifications	Control Frame	Integrated Control and Array Frame
Height	1,860mm (73.2 in.)	1,860mm (73.2 in.)
Width (with two side panels)	782mm (30.77 in.)	782mm (30.77 in.)
Depth	800mm (31.5 in.)	800mm (31.5 in.)
Weight	553kg (1,216.6 lbs) ³	796kg (1,751.2 lbs) ⁴
Heat	2.17kW ³	4.52kW ⁴
Power	2.31kVA ³	4.87 kVA ⁴
	Array Frame (One to Four)	
Height	1,860mm (73.2 in.)	
Width (with two side panels)	750mm (29.5 in.)	
Depth	800mm (31.5 in.)	
Weight	755kg (1,661 lbs) ⁵	
Heat	6.61kW ⁵	
Power	7.16kVA ⁵	

Hard Disk Drives

	73GB	73GB	146GB
GMR (Giant Magnetoresistive Head Technology)			
Rotation Speed	10,025RPM	14,904RPM	10,025RPM
Form Factor	3.5-inch LP	3.5-inch LP	3.5-inch LP
Media Diameter	3.0 in.	2.5 in	3.0 in.
Actuator	Rotary	Rotary	Rotary
Servo System	Digital	Digital	Digital
INTERFACE	FC-AL	FC-AL	FC-AL
Internal Transfer Rate			
Inner Zone	44.2MB/sec	74.5MB/sec	57.3
Outer Zone	74.0MB/sec	111.4MB/sec	99.9
Average Seek Time			
Read	4.9ms	3.8ms	4.9ms
Write	5.4ms	4.2ms	5.4ms

- 1 Extended Serial Adapters are compatible with ESCON protocol.
 - 2 Only one with entry level ACP
 - 3 One controller, 64GB cache, 4 ACP pairs, 32 Fibre Channel ports.
 - 4 One disk array frame, 256 disk drives, 18,371GB raw capacity using 73GB hard disk drives.
 - 5 One full system, 32GB cache, 1 ACP pair, 24 Fibre Channel ports, and 128 disks.
- Note: All capacities are based on
1GB = 1,000,000,000 bytes
1 terabyte (TB) = 1,000GB

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DISK-438-02 March 2004