



IBM System Storage DS5000 series



The IBM System Storage™ DS5000 series storage system is designed to meet today's and tomorrow's demanding open-systems requirements while establishing a new standard for life cycle longevity. Building on many decades of design expertise, the DS5000 series' seventh-generation architecture delivers relentless performance, real reliability, multi-dimensional scalability and unprecedented investment protection.

Highlights

- ***New seventh-generation architecture with extreme and balanced performance for increased application performance***
- ***“Pay-as-you-grow” scalability, initially 256 drives, for the most demanding capacity requirements***
- ***Unique host interface cards designed to provide investment protection and life cycle longevity***
- ***Designed to support high availability with dual active, hot-swappable controllers, power supplies and many non-disruptive firmware upgrades***
- ***Heterogeneous support for the most common operating systems, including Microsoft® Windows®, UNIX® and Linux®***
- ***Architecture efficiently handles compute-intensive parity calculations, enabling exceptional disk-based performance that's ideally suited for RAID 5 and RAID 6 configurations***

The DS5000 series delivers industry-leading performance and is equally adept at supporting transactional applications such as databases and OLTP, throughput-intensive applications such as HPC and rich media, and concurrent workloads for consolidation and virtualization. With its relentless performance, architected to prove the highest reliability and availability, the DS5000 series storage system can support the most demanding service level agreements (SLAs). And when requirements change, the DS5000 series can add or

replace host interfaces, increase performance, grow capacity, add cache and be reconfigured on the fly—ensuring that it will keep pace with your growing company.

This multi-dimensional scalability enables the DS5000 series storage system to extend beyond the normal three- to four-year life cycle—protecting your storage investment by delaying (or even eliminating) the expense of migrating data to a new system and allowing its acquisition costs to be amortized over extended periods of time. This life cycle longevity enables the DS5000 series to continue delivering value long after other systems have been retired.

The DS5000 series storage system delivers the reliability and availability attributes to further push midrange storage into the enterprise. IBM has a long history of designing highly reliable and available storage systems, and the DS5000 series is the culmination of that expertise. With redundant components, automated path failover and extensive online configuration, reconfiguration and maintenance capabilities, the DS5000 series helps ensure that your data will be available 24x7x365. The DS5000 series also offers multiple replication options and a persistent cache backup to ensure that any data in cache is captured and safe in the event of a power outage.

EXP5000 drive enclosure

The EXP5000 drive enclosure is more than “just-a-bunch-of-disks.” It's designed to optimize performance, availability and serviceability.

- *4 Gb/s FC interfaces for connectivity*
- *Up to 16 dual-ported FC or SATA disk drives intermixable in same enclosure.*
- *ESM-embedded “loop switch”*
- *Redundant 4 Gb/s FC drive loops ensure complete accessibility to all drives in the event of a loop or cable failure.*
- *Redundant power supplies, cooling fans and ESMs.*
- *24x7x4hr Warranty same as the DS5000*

All primary components are hot-swappable CRUs and can be easily accessed and removed or replaced

Designed to seamlessly adapt to ever-changing requirements—enabling unprecedented life cycle longevity and investment protection

With a foundation that includes industry-leading performance, real reliability and robust storage management, the DS5000 series can add or replace host interfaces, increase performance, grow capacity, and add cache.

Multi-dimensional scalability keeps up with continuous growth

Look to the IBM DS5000 series storage system to meet today's and tomorrow's demanding open-systems requirements. Its multi-dimensional scalability enables the DS5000 series to adapt when requirements change, and to continue to deliver required performance, capacity and connectivity going forward.

Relentless performance to run business-critical applications

The DS5000 series delivers unprecedented performance in a family of industry-leading technology. Its seventh-generation architecture is optimized to power faster, more responsive applications—increasing productivity, improving customer satisfaction and meeting SLAs. The DS5000 series is equally adept at supporting transactional applications, such as databases and OLTP, and throughput-intensive applications such as HPC and rich media. The DS5000 series' linear scalability helps its performance scale to meet the most demanding application and growth requirements.

Trusted storage that protects and delivers your data when needed—24x7x365

IBM has a long history of providing customers with highly reliable and available storage systems, and the DS5000 series is the culmination of that expertise. Architected with a goal of the

highest reliability and availability, the DS5000 series storage system offers redundant components, automated I/O path failover, and extensive online configuration, reconfiguration and maintenance capabilities, helping to ensure that your data is available 24x7x365. The DS5000 series helps protect stored data as well:

- *DACstore technology stores configuration metadata on each drive.*
- *Proactive Drive Health Monitoring (PDHM) technology identifies faulty drives before they create problems.*
- *RAID 6 technology guards against concurrent drive failures and errors.*
- *Persistent cache backup ensures that data in the cache is captured and safe in the event of a power outage.*

Unparalleled flexibility to address a wide range of storage needs

IBM DS Storage Manager software provides unparalleled configuration flexibility to ensure that the DS5000 series storage system is configured to meet your application's LUN requirements. DACstore technology allows drives to be relocated with data intact as requirements change. Support for intermixing high-performance and high-capacity drives creates tiered storage in a single

system. And the DS5000 series' balanced performance excels at IOPS and MB/s. This extensive flexibility makes the DS5000 series a great system for storage consolidation implementations where an individual storage system supports concurrent and diverse workloads and application requirements.

Feature-rich management software that maximizes utilization and minimizes storage TCO

As data continues to grow, companies must be able to efficiently manage their storage while minimizing total cost of ownership. The unparalleled configuration flexibility of DS Storage Manager software creates superior utilization—getting the most usable capacity out of the purchased capacity, while maximizing performance efficiency. And when requirements do change, its industry-unique dynamic capabilities support on-the-fly reconfigurations. DS Storage Manager software offers centralized administration of all DS Storage Manager-based systems, providing a common interface across all products and platforms. DS Storage Manager also offers a unique blend of robust functionality with intuitive GUI and wizards to ensure that storage is easily and optimally configured.

Efficiencies to cut your purchase and operational IT costs

The DS5000 series' modular design offers an affordable entry point by avoiding over configuration and delivers seamless "pay-as-you-grow" scalability as requirements change. Its efficient storage utilization lowers raw capacity requirement, and its support for intermixing high-performance and high-capacity drives enables tiered storage. Like all IBM storage systems, the DS5000 series' exceptional per-drive performance creates performance value by getting the most performance out of the fewest drives. This reduces the number of drives needed to meet performance and capacity demands—supporting LSI's commitment to green technologies.

Newest member of field-proven IBM storage family

The DS5000 series storage system is driven by the same field-proven firmware that all other IBM controllers employ, enabling common features, functionality and management interface across all DS Storage Manager-based systems. This commonality enables lower TCO by reducing management complexity and offering centralized administration. What's more, the DS5000 series storage system continues our long-standing tradition of

unparalleled investment protection. DS Storage Manager software's unique DACstore technology stores configuration metadata on every configured drive, and does so in exactly the same way on every system. This unique design creates data-intact drive portability—supporting drive-level

reconfigurations and controller-level upgrades as system requirements change. Drives can be relocated within the storage system to improve channel utilization/protection, or even migrated

as a complete volume group into another IBM storage system. Additionally, lower-end IBM storage systems can be seamlessly upgraded to high-performance IBM systems. And in each instance, all configuration and user data remains intact on the drives.

IBM System Storage DS5000 series - At a glance

Model	1818-51A, 1818-53A
RAID Controller	Dual Active
Cache	DS5100 (1818-51A): 8 GB Total, 1818-53A (DS5300): 8 GB or 16 GB total
Host Interface	DS5100: 8 x 4 Gbps FC host interface cards' - DS5300 up to 16 x 4 Gbps host interface cards, Auto-negotiate to 1, 2, and 4 Gbps speeds
Drive Interface	Sixteen 4 Gb/s drive loops support up to 256 drives
Supported drives with EXP5000 and/or EXP810 expansion	750/7.2K SATA DDM, 1,000 GB/7.2K SATA DDM, 146.8 GB/15K 4 Gbps FC DDM, 300 GB/15K 4 Gbps FC DDM, 450 GB/15K 4 Gbps FC DDM
RAID Levels	RAID 0, 1, 3, 5, 6 and 10
Storage partitions	8, 16, 32, 128, 256 or 512 storage partitions
Maximum drives supported*	256 drives max with use of 16 EXP5000's or EXP810 or a mixture of both (not to exceed 16)
Fans and power supplies	Dual-redundant, hot-swappable
Rack support	19" industry standard rack
Management software	IBM System Storage DS Storage Manager
SAN support	Supported SAN fabric and gateways are available online at: http://www-03.ibm.com/systems/storage/disk/ds4000/pdf/interop-matrix.pdf

* Supports intermix of EXP5000 and/or EXP810 (with certain pre-requisites)

IBM System Storage DS5000 series - At a glance

Relative Humidity (no condensation)	DS5000 series Controller Enclosure	EXP5000 Drive Enclosure
Operating range	20% to 80%	20% to 80%
Storage range	10% to 93%	10% to 90%
Transit range	5% to 95%	5% to 95%
Maximum dew point	26°C (79°F)	26°C (79°F)
Maximum gradient	10% per hour	10% per hour
Altitude ranges	DS5000 series Controller Enclosure	EXP5000 Drive Enclosure
Operating	30.5 m (100 ft) below sea level to 3,048 m (10,000 ft) above sea level	30.5 m (100 ft) below sea level to 3,000 m (9,842 ft) above sea level
Storage	30.5 m (100 ft) below sea level to 3,048 m (10,000 ft) above sea level	30.5 m (100 ft) below sea level to 3,000 m (9,842 ft) above sea level
Transit	30.5 m (100 ft) below sea level to 12,000 m (40,000 ft) above sea level	30.5 m (100 ft) below sea level to 12,000 m (40,000 ft) above sea level
Heat dissipation	DS5000 series Controller Enclosure	EXP5000 Drive Enclosure
Btu/Hr	1,842	1,517
KVA	0.562	0.462
Watts (AC)	540	444
Amps (240 VAC)	2.25	1.85
The tabulated power and heat dissipation values are the maximum measured operating power.		
Acoustic noise	DS5000 series Controller Enclosure	EXP5000 Drive Enclosure
Sound power	6.0 bels	6.5 bels
Sound pressure	60 dBA	65 dBA
Power input	DS5000 series Controller Enclosure	EXP5000 Drive Enclosure
Nominal voltage range	90 VAC to 264 VAC	90 VAC to 264 VAC
Frequency range	50 to 60 Hz	50 to 60 Hz
Max operating current	5.40 A at 100 VAC 2.25 A at 240 VAC	3.90 A at 100 VAC 2.06 A at 240 VAC
Typical current		115 VAC, 60 Hz at 0.73 power supply efficiency and 0.96 power factor 230 VAC, 60 Hz at 0.73 power supply efficiency and 0.96 power factor



For more information

To learn more about the IBM System Storage DS5000 series, please contact your IBM marketing representative or IBM Business Partner, or visit:

ibm.com/systems/storage/disk

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August 2008
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TSD03061-USEN-00