

## IBM System Storage DS8000 series



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### Highlights

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- **Designed to deliver robust, flexible and cost-effective disk storage for mission-critical workloads**
- **Built for outstanding performance and supports 4 Gbps FC/IBM FICON® high bandwidth connectivity for fast access to data**
- **Offers IBM's first implementation of storage system logical partitions (LPARs) to help enable consolidation while maintaining separation for differing workloads**
- **Created to help provide exceptional system availability to support continuous operations**
- **Able to scale up to 320TB of physical capacity that can be accessed by a wide variety of servers**
- **Offers a choice of Fibre Channel and Fiber Channel ATA disk drives, enabling tiered storage usage**
- **Designed to facilitate asset protection and help lower costs with model-to-model field upgrades and a standard 4-year warranty on hardware and advanced functions**

### **Virtualized, resilient, high-performance storage for medium to large enterprises**

The IBM System Storage™ DS8000™ series has been enhanced to include IBM System Storage DS8000 Turbo models, which offer even higher performance, higher capacity storage systems that are designed to deliver a generation-skipping leap in performance, scalability, resiliency and total value. Created specifically for the mission-critical workloads of medium and large enterprises, the DS8000 series can help consolidate system storage, support tiered storage requirements, simplify storage management and support system availability to address the needs of businesses operating in an on demand world.

The DS8000 series is designed to provide exceptional performance while adding virtualization capabilities that can help organizations allocate system resources more effectively and better control application quality of service.

The DS8000 series offers powerful data backup, remote mirroring and recovery functions that can help protect data from unforeseen events. In addition, the DS8000 supports non-disruptive microcode changes. These functions are designed to help maintain data availability, which can benefit businesses in markets where information must be accessible around the clock, every day of the year.

### **Virtualized to simplify**

Virtualization can offer dramatic opportunities for organizations to help reduce the total cost of ownership (TCO) of their storage systems. Introducing a new level of virtualization with innovative storage system logical partitioning (LPAR), the DS8000 series delivers the first use of the IBM POWER5™ processor IBM Virtualization Engine™ logical partitioning capability. This storage system LPAR technology is designed to enable the creation of two completely separate storage subsystems that can run the same or different versions of the microcode. The subsystems can be used for production, test or other unique storage environments, and they operate within a single physical enclosure. Each storage partition can be

established to support the specific performance requirements of a different, heterogeneous workload. The DS8000 series system hardware-based partitioning implementation helps to isolate and protect the LPARs. These storage system LPAR capabilities are designed to help optimize management efficiency, cost effectiveness and flexibility.

### **Impressive performance**

The DS8000 series is designed to deliver a new standard in high performance, helping organizations process, store and retrieve data more quickly. Its innovative design incorporates a high-bandwidth and fault-tolerant internal Fibre Channel interconnect, Fibre Channel disk technology, and a patented highly efficient new caching technology. The DS8000 series includes top-notch front-end performance with single port performance of up to 400 MBps with up to four ports per host adapter. The DS8000 series also boasts leading back-end performance, designed to deliver greater total storage system sequential bandwidth than other enterprise disk storage platforms. The DS8000 series uses 64-bit

IBM POWER5 microprocessors in dual 2-way (for the DS8100) or dual 4-way (for the DS8300) processor complexes to help reduce cycle times and accelerate response times, giving users fast access to vital information. And now for even greater performance, the DS8000 Turbo models include an updated IBM POWER5+™ processor feature that can enable, for transaction processing workloads, up to 15% improvement in I/O operations per second compared to previous DS8000 models. The DS8000 models are designed to offer outstanding performance scalability—scaling up in disk, cache, and fabric infrastructure—with processor “wayness” (2-way, 4-way, etc.).

Cache efficiency can help to greatly improve I/O performance and reduce the overall cache requirements. DS8000 series systems can be equipped with up to 256GB of cache to help support high-capacity workloads. The DS8000 series caching algorithms are designed to dynamically and adaptively self-tune to continually optimize for the current workload. It can help the system deliver an unimpeded flow of data and high levels of throughput—bringing information to businesses and their customers smoothly and rapidly.

Moreover, the cooperative caching and I/O priority functions of the DS8000 can help enable even greater cache efficiency and performance for higher priority IBM AIX® DB2® applications running on IBM System p™ servers.

The DS8000 series also incorporates features designed to extend the performance in an IBM System z™ environment. Parallel Access Volumes (PAVs), priority I/O queuing, Multiple Allegiance capabilities and support for the IBM System z MIDAW facility help the DS8000 series to process data efficiently, dramatically improving performance and enabling better use of large volumes. To facilitate rapid data transfer between the storage enclosure and the server, the DS8000 series can also support up to 128 4 Gbps Fibre Channel/FICON ports or up to 64 IBM ESCON® ports.

All of these performance enhancements can deliver tangible results: The DS8000 series systems have as much as six times the throughput of the IBM TotalStorage® Enterprise Storage Server® (ESS) Model 800. This enables

customers to buy one DS8000 series system where multiple other storage servers may have been needed in the past for similar capacity and throughput.

#### **Exceptional flexibility and scalability**

The DS8000 series is well-prepared to address the exponential growth of data within an enterprise. Many of the boundaries for logical volumes, devices, paths, LUNs, and logical subsystems (LSS) have been extended so previous disk storage limitations no longer apply. Additionally, the physical storage capacity of the DS8000 series systems can range from 1.1TB up to 320TB of physical capacity, and disk capacity may be increased within a frame without system disruption by adding integrated packages of 16 disk drives. Organizations can mix and match disk packages that contain 73GB, 146GB or 300GB Fibre Channel disk drives or 500GB Fibre Channel ATA (FATA) disk drives to construct a tailored system that addresses their specific price, performance and capacity requirements. The DS8000 offers Fibre Channel ATA (FATA) disk drive packages to help meet second-tier storage needs. These FATA

drives can provide cost-effective storage for large amounts of less frequently used information such as backup data, archiving, document imaging, retention, and reference data. In addition, IBM RAID-5 and RAID-10 configurations can be intermixed within a single DS8000 series enclosure.

The DS8000 series models are modular systems that are designed to be built upon and upgraded from one model to another in the field, helping organizations respond swiftly to changing business requirements. To help accommodate more ongoing workload fluctuations, the DS8000 series supports the addition or deletion of volumes on-the-fly to help meet sudden spikes in demand or to react to other changes. To help further meet the changing storage needs of growing businesses, the DS8000 series can use the IBM Standby Capacity on Demand option, which is designed to allow access to extra capacity quickly whenever the need arises. With all these capabilities, the DS8000 series can quickly respond to changing business needs.

### **Availability**

The DS8000 series is designed to address the needs of on demand environments requiring the highest levels of availability. It has a dual-processor complex implementation and is designed to support concurrent microcode loads, dynamic hardware upgrades, sophisticated Light Path diagnostics, and near transparent I/O failover and failback. It also features many redundant, hot-swappable components to help support continuous operations. Furthermore, each system is built to monitor its internal functions. If a potential problem is detected, DS8000 series systems can automatically “call home” to alert service personnel that a potential problem could be developing. The DS8000 series also offers an audit logging security function designed to track and log changes made by administrators.

The DS8000 series offers exceptional advanced functions for data backup, remote mirroring and disaster recovery. These capabilities, which are part of the IBM System Storage Resiliency Family, are designed to help maintain access to information even in unexpected circumstances.

### **IBM FlashCopy**

The IBM FlashCopy® feature is a point-in-time copy capability that can be used to help reduce application outages caused by backups and other data copy activities. FlashCopy is designed to enable data to be copied in the background while making both source and copied data available to users almost immediately. In addition to being able to make a full physical copy in the background, FlashCopy has a “no-copy” feature that is designed to reduce internal data movement overhead and can enable a quicker reuse of disk capacity that might otherwise be dedicated to copy operations for an extended period of time. With its copy-on-write capability, the only data copied is that which is about to be changed or overlaid. Copies can be made quickly, after which data can be backed up and capacity reallocated.

### **Remote mirroring and copy functions**

The DS8000 series remote mirroring and copy functions—Global Mirror, Metro Mirror and Global Copy—are designed to create duplicate mirrors and copies of application data at remote sites that are cities—or continents—away. These capabilities include both synchronous and asynchronous protocols for disaster recovery and backup.

High-speed data transfers help keep data up-to-date and allow it to be retrieved rapidly. Global Mirror is designed to help maintain data currency at the remote site within a few seconds of the local site, regardless of distance. It includes exceptional capabilities, such as self-managed cross-system data consistency groups, which help protect data integrity for large applications across a wide variety of flexible system configurations. The DS8000 also supports a three-site Metro/Global Mirror solution to help enable even greater protection from unexpected site outages.

These copying and mirroring capabilities are designed to help give users constant access to critical information during both planned and unplanned local outages. For businesses in on demand fields, that level of data availability and resiliency is essential in sustaining business continuity. To help increase flexibility and investment protection, these functions are compatible with those of the IBM System Storage DS6000™ series and the IBM TotalStorage ESS 800 and 750.

**Simplified systems management**

The DS8000 series simplifies system deployment by supporting major server platforms, including IBM z/OS®, z/VM®, OS/400®, i5/OS® and AIX operating systems, as well as Linux®, HP-UX, Sun SOLARIS, Novell NetWare and Microsoft® Windows® environments, among others. With such broad platform support, the DS8000 series can easily accommodate a comprehensive list of applications.

The DS8000 series is also designed to streamline configuration and management capabilities through the IBM DS Storage Manager—a high-function, easy-to-use GUI management console that helps storage administrators manage multiple subsystems and controllers, perform logical configuration setup and changes and also administer copy service management functions. It includes both online real-time configuration management, as well as an offline function that is designed to allow for the creation and saving of logical configurations for later use. The DS Storage Manager is designed to be accessed conveniently through a Web browser from any location with network privileges, greatly enhancing management efficiency.

To help enable even more effective and flexible system management the DS8000 series also supports a command line interface (CLI) and an SMI-S compliant application programming interface (API). Moreover, configuration options such as RAID 5 or 10 selection, volume creation/deletion and LUN masking are designed to be under direct user control with no vendor assistance required. Changes are designed to be made dynamically while the DS8000 series remains online.

Available separately, IBM TotalStorage Productivity Center software takes storage management to a new level. This collection of software provides a single administrative interface for the DS8000, many other individual IBM storage systems, and non-IBM disk systems that are also based on open SMI-S interfaces. IBM TotalStorage Productivity Center (TPC) for Replication can help in the management, automation and monitoring of FlashCopy and remote mirroring functions.

**More storage in less space**

The DS8000 series packs more capacity into each enclosure than the previous generation of IBM storage units. The result is a disk system that occupies up to 20 percent less floor space than the ESS 800 while requiring less management and maintenance. The benefit to businesses is a dramatic reduction in acquisition, operation and real estate costs.

**Completing the solution**

Whatever your requirement, IBM can help to support it with a complete solution that includes storage hardware, servers, software and support. The DS8000 series offers a leading 4-year warranty with IBM world-class support. Additionally, IBM Global Services can offer comprehensive assistance, including planning and design as well as implementation and migration support services. If a hands-on test drive of IBM storage solutions or access to proof-of-concept and benchmarking platforms is desired, you can visit an IBM briefing center or an IBM Solution Center. Moreover, IBM works with IBM Business Partners and other leading technology companies to deliver the right solutions for your business.

## IBM System Storage DS8000 Turbo models at a glance

Models	DS8100 (931)	DS8300 (932, 9B2)
Processor	POWER5+	POWER5+
Processor configuration	dual 2-way	dual 4-way
Virtualization Engine (LPAR) capability	Not available	Optional
Processor memory for cache and NVS (min/max)	16GB/128GB	32GB/256GB
Host adapter interfaces	4-port 4 Gbps or 2 Gbps Fibre Channel/FICON, 2-port ESCON	4-port 4 Gbps or 2 Gbps Fibre Channel/FICON, 2-port ESCON
Host adapters (min/max)	2/16	2/32
Host ports (min/max)	4/64	4/128
Drive interface	FC-AL	FC-AL
Number of disk drives (min/max)	16/384	16/640
Device adapters	Up to 8 4-port 2 Gbps FC-AL	Up to 16 4-port 2 Gbps FC-AL
Maximum physical storage capacity	192TB	320TB
Disk sizes	73GB (15,000 rpm) 146GB (10,000 rpm and 15,000 rpm) 300GB (10,000 rpm) 500GB (7,200 rpm) FATA	73GB (15,000 rpm) 146GB (10,000 rpm and 15,000 rpm) 300GB (10,000 rpm) 500GB (7,200 rpm) FATA
RAID levels	5, 10	5, 10
Dimensions (height x width x depth)	193 x 84.7 x 118.3 cms With one expansion frame: 193 x 169.4 x 118.3 cms	193 x 84.7 x 118.3 cms With one expansion frame: 193 x 169.4 x 118.3 cms With two expansion frames: 193 x 254.1 x 118.3 cms
Maximum weight	1189 kg (2620 lbs) Add per expansion frame: 1089 kg (2400 lbs)	1307 kg (2880 lbs) Add per expansion frame: 1089 kg (2400 lbs)
<b>Operating environment</b>		
Dry bulb temperature	16-32°C (60-90°F)	16-32°C (60-90°F)
Relative humidity	20-80%	20-80%
Thermal load BTU/hr	18,772	23,891
Power supply	Three phase 50/60 Hz	Three phase 50/60 Hz
Caloric value BTU/hr	24,000	24,000
Electrical power kVA	7.0	7.0
<b>Supported systems</b>		
	For more details on supported servers, visit <b>ibm.com/totalstorage/disk</b>	For more details on supported servers, visit <b>ibm.com/totalstorage/disk</b>



## For more information

Contact your IBM representative or an IBM Business Partner or visit:

[ibm.com/totalstorage/ds8000](http://ibm.com/totalstorage/ds8000)



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MB, GB and TB equal 1,000,000, 1,000,000,000 and 1,000,000,000,000 bytes, respectively, where referring to storage capacity. Actual storage capacity will vary based upon many factors and may be less than stated.

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