

IBM System Storage DS8000 Turbo series



Highlights

- **Performance:** *New dual IBM POWER6-based controllers, PCI Express (Peripheral Component Interconnect Express) Generation 2 internal component interconnect, and device adapter cards enable up to over 2.5 times performance improvement over previous models.*
- **Availability & Resiliency:** *Greater than five-nines availability¹ with redundant, hot-swappable components, faster concurrent microcode updates, and a steady, 10-year lineage of microcode improvements built on the IBM POWER server architecture.*
- **Flexibility & Scalability:** *Clients can scale up from the smallest configuration to the largest configuration nondisruptively by upgrading drive capacity, host adapters, drive adapters, memory, and even the system's processor complexes.*
- **Consolidation:** *Manage growth and reduce operational complexity through consolidation with high-performance solid-state drives, enterprise fibre channel drives, high-capacity Serial ATA (SATA) drives, advanced management capabilities, support for advanced IBM deduplication technology, and thin provisioning.*
- **Security:** *Protect sensitive information from internal and external threats with innovative self-encrypting disk drives that can help address PCI-DSS (Payment Card Industry Data Security Standard) compliance requirements.*
- **Investment Protection:** *Exceptional total cost of ownership with Enterprise Choice warranties of up to four years on both hardware and advanced function software, while preserving client investments in prior models with full interoperability of hard drives, drive enclosures, tools, scripts, and copy services.*

Scalable, resilient, high-performance storage for mission-critical workloads

The IBM System Storage™ DS8700 is the most advanced model in IBM's DS8000® lineup and introduces new dual IBM POWER6®-based controllers that usher in a new level of performance for the company's flagship enterprise disk platform. With overall performance improving up to over 2.5 times, the new DS8700 is designed to support the most demanding business applications with its superior data throughput, unparalleled resiliency features and five-nines availability¹. In today's dynamic, global business environment, where organizations like yours need information be reliably available around the clock and with minimal delay, can you really afford not to run your business on the DS8000 series? Moreover, with its tremendous scalability, flexible tiered storage options, broad server support, and support for advanced IBM deduplication technology, the DS8000 can help simplify the storage environment by consolidating multiple storage systems onto a single system while providing the availability and performance you've come to trust for your most important business applications.

The new DS8700 model is a testament to IBM's legendary reputation for outstanding quality and world-class engineering. And in today's challenging economic climate, having an enterprise disk platform that combines the highest levels of system and application availability with superior performance and total cost of ownership is essential.

Reduce cost and complexity through tiered storage consolidation and deduplication

Physical capacity of the DS8000 can range from 1.1 Terabyte (TB) to over 1 Petabyte (PB) on a single system, providing scalability on which to grow and consolidate data from multiple storage systems. Consolidating disk platforms in this way can help customers address both their performance and capacity requirements more effectively, while simplifying their storage environments and reducing costs related to data center floor space, energy usage, and cooling. Add to that the tremendous capacity optimization and performance benefits when combining the DS8000 series and the world-class data deduplication technology of the IBM System Storage ProtecTIER® Deduplication product line, and you've got an enterprise disk system that can help you maintain control of your burgeoning storage environment.

World-class performance to maximize responsiveness in today's on-demand world

The DS8000 series is designed to deliver the utmost in high performance—helping organizations store, process, and retrieve data at astounding speeds. Its unique design incorporates a high-bandwidth and fault-tolerant internal component interconnect, switched connections to internal drives, innovative cache optimization algorithms from IBM Research, as well as lightning fast solid-state drives. Not only is the DS8000 designed to deliver the highest levels of balanced performance throughout the system, close collaboration with other IBM offerings across IBM's storage, server and software portfolios yields the type of solution performance our competitors can only envy.

The latest example is the close collaboration across IBM's hardware and software organizations that aims to enable clients to get more value from solid-state storage solutions by looking at how solid-state drives (SSDs) affect not just the disk system, but also the overall application environment, including

servers and software. While competitors would have you believe that simply supporting SSDs in a disk system is sufficient, IBM believes that as high-end disk systems increasingly incorporate multiple tiers of drives, clients need help aligning various application workloads and their data on the appropriate drive tier, which requires insight beyond simply the disk system. IBM is there to help with smart performance analysis and data migration tools that can help clients optimize the performance and cost effectiveness of their tiered storage deployments. That's the IBM difference.

The DS8700 is the latest model in the DS8000 series and is built on powerful and market-proven IBM POWER6 microprocessors in dual two-way or dual four-way shared symmetric multi-processor (SMP) complexes. Not only do these POWER6 processors offer much higher system performance, they are also more energy efficient with over a 56 percent increase in IOPS/Watt than previous DS8300 models. The decision to base the DS8000's design on this the IBM Power® chip architecture is complemented by two additional tiers of high-performance processors

within its host and device adapters, which further add to the DS8000's outstanding, balanced performance. Upgraded processors on the system's device adapters double the adapter's performance, which increases performance even further.

The DS8000 series also includes a variety of features designed to extend the performance of IBM System z® environments. The most recent of these performance innovations includes advanced support for High Performance FICON® for System z, which can double data throughput over the traditional FICON interconnect.

In addition to its performance gains, to address the reliability and high availability requirements expected of high-end disk systems, the new DS8700 and its POWER6 processor complex reuses over 90 percent of the DS8300's microcode. What's more, the DS8300's disks and disk enclosures, as well as the DS8300 tools and scripts, are compatible with the DS8700, which translates into extraordinary investment protection for clients migrating to this new model. Existing clients will also appreciate the fact that their DS8300 (and some prior IBM TotalStorage®

Enterprise Storage Server®) remote mirror and copy functions are interoperable with the new DS8700. Why is this significant? It's significant because it underscores our commitment to providing our clients the performance and reliability they've come to expect from IBM. So, while the new DS8700 provides a tremendous boost in performance over prior models, it also preserves the reliability and high availability necessary to support the mission-critical applications of our most demanding clients.

Increase security and reduce cost and complexity of drive retirement with innovative self-encrypting drives

The unrelenting tide of data breaches over the last several years has fueled an immense interest in IBM self-encrypting storage, which automatically secures all information on a tape cartridge or disk drive when they are physically removed from a storage system. By having the entire tape cartridge or disk drive encrypted, customers can be assured that should the cartridge or drive get lost or stolen, the information can't be read by unauthorized parties...

anywhere. In addition, this unique self-encrypting storage solution also provides a simple and cost effective approach to cleansing sensitive data from storage systems that are being retired or repurposed. This cryptographic erasure is quick, effective, and extremely inexpensive, compared to other methods of drive disposal that can be much more risky. If you are looking for a storage solution that can help you address PCI-DSS (Payment Card Industry Data Security Standard) compliance requirements, the IBM System Storage DS8000 is the disk system for you!

Adapt to a changing world with exceptional flexibility and scalability

Customers and industry observers praise the DS8000 series for its unique combination of flexibility, resiliency, performance, and scalability, which can help address the many challenges stemming from the exponential growth of data across the enterprise. Savvy businesses are looking for innovative ways to manage and adapt in today's increasingly competitive, global business environment, and the DS8000 series is designed to meet this challenge with multi-vendor interoperability and broad support for open industry standards.

What's more, the extraordinary adaptability of the DS8000 series is further demonstrated by the ability to extend and upgrade from one model to another on-site, helping organizations quickly respond to changing business requirements. Unlike high-end disk platforms from some competitors, customers with an older IBM POWER5™ model, for instance, can upgrade to an IBM POWER5+™ or even the latest IBM POWER6 model without purchasing an entirely new system. And now that we're talking about investment protection, clients with older DS8000 and even Enterprise Storage Systems, which date back 10 years, can use their advanced copy services across both newer and older systems! You want investment protection? You got it!

To help accommodate real-time workload fluctuations, the DS8000 series also supports the addition, deletion and dynamic expansion of storage capacity on the fly to help meet sudden spikes in demand or to react to other environmental changes. Dynamic Volume Expansion and Thin Provisioning not only help reduce the need for customers to disrupt their applications to add capacity, they also can significantly lower the amount of time administrators spend provisioning new storage, which can help lower management costs across your environment.

If your organization needs the flexibility to run a mix of performance-optimized workloads alongside those that might require a little less performance but with the reliability that a tier-one disk system affords, the DS8000 can help with that too. With the capability to adeptly run workloads on three different tiers of drives (SSDs, fibre channel, SATA), you have all the flexibility you need to consolidate a variety of disk platforms on a single DS8000 system.

Another example of the flexibility and modularity of the DS8000 series is the ability to increase physical storage capacity within a frame without system disruption. In most cases, drive packages of different capacities and/or performance characteristics can be intermixed within a system, which offers additional flexibility for customers looking to deploy a tiered storage environment within the DS8000 system.

Make business continuance a reality with high-availability architecture

The DS8000 series is designed to help address the needs of dynamic environments requiring the highest levels of availability. It is designed to support dynamic system changes, such as online system microcode updates and online hardware upgrades. The DS8000

also features redundant, hot-swappable components to help support continuous operations. This highly resilient design and its five-nines availability make the DS8000 series an ideal storage platform for supporting today's round-the-clock, global business environment.

All disks are RAID-protected, such that multiple spare disks are configured in a RAID group to allow a failed, RAID-protected disk to be rebuilt quickly and automatically to maintain access to information. The DS8000 series supports RAID-5, RAID-6 and RAID-10 configurations for increased flexibility. Furthermore, each DS8000 system is built to monitor its own internal functions, so it can "call home" automatically to alert service personnel if it detects a potential problem arising. Sophisticated Light Path Diagnostics also facilitate system maintenance, and the DS8000 series also offers an audit log security function designed to log changes made by administrators to aid in root cause analysis.

In addition to its exceptionally resilient architecture, the DS8000 series offers an array of advanced functions for data backup, remote mirroring and disaster

recovery. The DS8000's advanced two-site and three-site business continuity capabilities give customers the peace of mind of knowing their mission-critical applications will be available when they need them during both planned and unplanned system outages. With this type of resiliency and high availability, it's no wonder customers turn to the DS8000 to support their most important business applications.

Simplified systems management

The DS8000 series can help simplify 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, VMware and Microsoft® Windows® environments, among others. With such broad platform support, the DS8000 series can easily accommodate a wide array of applications.

The DS8000 series includes powerful management capabilities that can help IT administrators regain control of their storage environments as their capacity grows. The DS8000 uses the IBM System Storage Productivity

Center (SSPC), an advanced management console that can provide a view of both IBM and non-IBM storage elements across the storage network. SSPC can enable a greater degree of simplification for organizations grappling with the growing number of disparate element managers in their environment.

Utilizing IBM Tivoli Storage Productivity Center Basic Edition software, the SSPC console extends the rich capabilities available through the IBM DS Storage Manager while offering the ability to manage a variety of storage devices connected across the storage area network (SAN). With its single sign-on capability for the various devices it manages, and its rich, user-friendly graphical interface, SSPC provides a comprehensive view of the storage topology from which storage administrators can inspect the real-time health of the environment at an aggregate or in-depth view. Moreover, IBM Tivoli Storage Productivity Center Standard Edition, which is also preinstalled on the SSPC console, can be licensed for more in-depth performance analysis, asset and capacity reporting, and automation of the DS8000, as well as other resources, such as server file systems, tape drives and libraries.

Adding to its management flexible, the DS8000 series also supports a command line interface (CLI) and an SMI-S-conformant application programming interface (API). Furthermore, dynamic volume creation/deletion and LUN masking for RAID-5, RAID-6 and RAID-10 configuration capabilities can be performed by storage administrators themselves without requiring special assistance from the vendor. Logical configuration changes, such as these, can be made dynamically while

the system remains online, a real benefit when supporting tier one applications.

Completing the solution

Whatever the requirements, IBM can help with a complete information infrastructure solution that includes storage hardware, servers, software, services, support and equipment financing. The DS8000 series also offers the Enterprise Choice Warranty, which allows customers to select one-, two-, three- and four-year support options with world-class IBM support.

Additionally, IBM Global Services can offer comprehensive assistance, including planning and design, as well as implementation and migration support services. IBM also collaborates with a variety of IBM business partners and leading technology companies to deliver the right solutions for your business. For a hands-on test drive or for access to IBM storage solutions for proof-of-concepts and benchmarking, customers can visit an IBM briefing center or an IBM solution center.

IBM System Storage DS8000 Turbo models at a glance

| Models | DS8100 (931) | DS8300 (932, 9B2) | DS8700 (941, 94E) |
|--|--|--|--|
| Shared SMP processor configuration | POWER5+ dual 2-way | POWER5+ dual 4-way | POWER6 dual 2-way or 4-way |
| Other major processors | PowerPC®, ASICs | PowerPC, ASICs | PowerPC, ASICs |
| Processor memory for cache and NVS (min/max) | 16 GB/128 GB | 32 GB/256 GB | 32 GB/384 GB |
| 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 | 4-port 4 Gbps Fibre Channel/ FICON |
| Host adapters (min/max) | 2/16 | 2/32 | 2/32 |
| Host ports (min/max) | 4/64 | 4/128 | 4/128 |
| Drive interface | FC-AL | FC-AL | FC-AL |
| Number of disk drives (min/max) | 16/384 | 16/1024 | 16/1024 |
| Device adapters | Up to eight 4-port FC-AL | Up to 16 4-port FC-AL | Up to 16 4-port FC-AL |
| Maximum physical storage capacity** | 384 TB | 1024 TB | 1024 TB |
| Disk sizes | 73 GB solid-state drives 146 GB solid-state drives 146 GB (15,000 rpm) 300 GB (15,000 rpm) 450 GB (15,000 rpm) 1 TB (7,200 rpm) | 73 GB solid-state drives 146 GB solid-state drives 146 GB (15,000 rpm) 300 GB (15,000 rpm) 450 GB (15,000 rpm) 1 TB (7,200 rpm) | 73 GB solid-state drives 146 GB solid-state drives 146 GB (15,000 rpm) 300 GB (15,000 rpm) 450 GB (15,000 rpm) 1 TB (7,200 rpm) |

IBM System Storage DS8000 Turbo models at a glance

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|-------------------------------------|--|--|--|
| RAID levels | 5, 6, 10 | 5, 6, 10 | 5, 6, 10 |
| Dimensions (height x width x depth) | 193 x 84.7 x 118.3 cm With one expansion frame: 193 x 169.4 x 118.3 cm | 193 x 84.7 x 118.3 cm With one expansion frame: 193 x 169.4 x 118.3 cm With two expansion frames: 193 x 254.1 x 118.3 cm | 193 x 84.7 x 118.3 cm per frame up to 5 frames total |
| Maximum weight | 1189 kg (2620 lb) Add per expansion frame: 1089 kg (2400 lb) | 1307 kg (2880 lb) Add per expansion frame: 1089 kg (2400 lb) | 1307 kg (2880 lb) base rack Add per expansion frame: 1089 kg (2400 lb) |

Operating environment:

| | | | |
|------------------------------|--|--|--|
| Dry bulb temperature | 16–32°C (60–90°F) | 16–32°C (60–90°F) | 16–32°C (60–90°F) |
| Relative humidity | 20–80% | 20–80% | 20–80% |
| Power supply | Single-phase or three-phase 50/60 Hz | Three-phase 50/60 Hz | Single-phase some configurations or three-phase 50/60 Hz |
| Caloric value BTU/hr min/max | 13,400/19,800 (for 93E: 7,500/22,200) | 17,400/24,000 (for 9AE 7,500/22,200) | 13,400/26,600 (941 rack) 7,500/22,200 (94E rack) |
| Electrical power kva min/max | 3.9/5.8 (for 93E: 2.2/6.5) | 5.1/7.0 (for 9AE: 2.2/6.5) | 3.9/7.8 (941 rack) 2.2/6.5 (94E rack) |
| Warranty | 4 years on type 2424 models 3 years on type 2423 models 2 years on type 2422 models 1 years on type 2421 models | 4 years on type 2424 models 3 years on type 2423 models 2 years on type 2422 models 1 years on type 2421 models | 4 years on type 2424 models 3 years on type 2423 models 2 years on type 2422 models 1 years on type 2421 models |

Supported systems

For more details on supported servers, visit ibm.com/systems/storage/disk.

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For more details on supported servers, visit ibm.com/systems/storage/disk.



For more information

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

ibm.com/systems/storage/disk/ds8000

Additionally, IBM Global Financing can tailor financing solutions to your specific IT needs. For more information on great rates, flexible payment plans and loans, and asset buyback and disposal, visit:

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Route 100
Somers, NY 10589

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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. Support for concurrent microcode updates may not be available for all updates.

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** Usable capacity depends on factors such as data format, RAID level and spare disks configured.

¹ Five-nines is a term used to denote that a piece of equipment is functioning with 99.999 percent reliability



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