IBM Systems
Data Sheet

IBM Storwize V5000

Designed to drive innovation and greater flexibility

Highlights

- Customize your storage system with flexible software and hardware options
- Optimize performance with flash storage and automated tiering
- Store up to five times more data on your existing storage with data reduction technologies[1]
- Consolidate and provide IBM® Storwize® V5000 capabilities to existing storage infrastructures
- Enhance productivity with a modern intuitive and simplified graphical user interface (GUI)

The enterprise data storage marketplace is changing at a rapid pace. Organizations of all sizes are experiencing new business and IT operational challenges. Businesses now need greater data collaboration, agility and cost efficiency to stay ahead of the competition. Today, data is more important than ever for making highly informed decisions in real time. Security teams need data to recognize and prevent fraud before it happens. Call centers need data to help accelerate customer service. Most important, top executives need data to develop strategic insights for battling the competition.

With the rise of new applications that demand the integration of big-data analytics, mobility and social platforms, organizations require additional storage capacity, performance, advanced functionality and flexibility. IT must deliver more services faster and more efficiently, enable real-time insight and support more customer interaction. The right infrastructure allows clients to share information, secure transactions and drive real-time insights.

To enter the new era of business, organizations need robust storage solutions such as Storwize V5000 to provide comprehensive storage services, extraordinary scale and simplified management with all-flash or hybrid-flash options—all designed to support key business initiatives.

Three Storwize V5000 hybrid models—IBM Storwize V5030, IBM Storwize V5020 and IBM Storwize V5010—provide the flexibility to start small and keep growing while leveraging existing storage investments. And, to enable organizations with midsized workloads to achieve advanced performance, IBM Storwize V5030F provides an all-flash solution at an affordable price.

Utilizing IBM Spectrum Virtualize™ software at its core, Storwize V5000 is designed to optimize performance, providing virtualization capabilities and greater flexibility. It includes built-in functions such as data reduction pools and IBM Easy Tier® technology to deliver extraordinary levels of efficiency and high performance. Available in different models, Storwize V5000 delivers enterprise capabilities at entry-level pricing to help handle business-critical applications while controlling costs for growing organizations.

Multiply your possibilities. Storwize V5000 models provide the flexibility to start small and keep growing, while leveraging existing storage investments.

IBM Storwize also helps organizations achieve better data economics to support the traditional and new mobile, social and analytics workloads that are critical for success. The shift to cloud computing requires a fundamental shift in how organizations consume and support IT.

Storwize V5000 is intended to deliver more of what you need from storage with greater flexibility—while using fewer resources. Using innovative IBM technology, a single Storwize V5000 system can scale up to 760 drives per system (and up to 1,520 drives with two-way clustered systems).

Encompassing Storwize family functions

Storwize V5000 leverages proven Storwize family functions, management and interoperability features.

Enhance storage function

Built with IBM Spectrum Virtualize software, Storwize V5000 enables applications to run without disruption, even when changes are made to the storage infrastructure.

Available in the larger model, Storwize V5030 also extends capabilities to other storage systems. When virtualized, data in a storage system becomes part of the Storwize solution, and it can be managed in the same way as internal drives. Data in external systems inherits all the Storwize functional richness and ease-of-use features, including advanced replication, high-performance thin provisioning, encryption, compression, deduplication and Easy Tier.

Heterogeneous data services help improve administrator productivity and boost storage utilization while also enhancing and extending the value of existing storage investments.

Enhance efficiency with data reduction

New data reduction pools help transform the economics of data storage. When applied to new or existing storage, they can significantly increase usable capacity while maintaining consistent application performance. This can help eliminate or drastically reduce costs for storage acquisition, rack space, power, and cooling, and can extend the useful life of existing storage assets. Capabilities include:

- Block deduplication[2] that works across all the storage in a data reduction pool to minimize the number of identical blocks
- New compression technology[2] that provides consistent performance across application workload patterns
- New SCSI UNMAP support that deallocates physical storage when operating systems delete logical storage constructs such as files in a file system.

Improve storage access with Easy Tier

Easy Tier provides automatic migration of frequently accessed data to high-performing flash storage or multiple tiers of disk drives, enhancing usage efficiencies. Operating at a fine-grained granularity, the optional Easy Tier function automatically repositions different data types to the appropriate class of drives based on input/output (I/O) patterns and drive characteristics, requiring no administrative interaction.

Protect your most valuable asset—your data

To help protect sensitive data from unauthorized users, Storwize V5030 and Storwize V5020 give IT teams the full power of storage encryption. In addition to placing encryption inside hardware arrays—which protects only against a subset of data security risks—IBM Spectrum Virtualize software includes encryption capabilities in its management layer. This enables organizations to add encryption across their existing heterogeneous storage arrays, while leveraging a single point of control for encryption throughout the storage layer.

Gain Storage Visibility, Insight, and Control

As the resource on which your business depends, data is paramount. Your storage systems take on even greater importance. IBM Storage Insights and Storage Insights Pro provide critical capabilities that enhance your experience throughout its lifetime:

- A single dashboard so you can see the status of all your IBM block storage at a glance
- Trend information about capacity and performance so you can make better and more informed decisions
- Storage health information that helps you bring your configuration in line with best practices
- When support is needed, the ability to easily open a ticket, upload log information, and view open tickets
- Detailed configuration data available to IBM specialists to help close tickets quickly.

Delivered as a service from IBM Cloud at no charge, Storage Insights is quick and easy to set up and requires no ongoing software maintenance. IBM Storage Insights Pro is an upgrade that provides more detailed information and additional capabilities.

Complement server virtualization and containerization

IBM Spectrum Virtualize in Storwize V5000 complements server virtualization with technologies such as PowerVM, Microsoft Hyper-V, VMware vSphere, Kubernetes and Docker.

Similar to virtualized servers, provisioning with Storwize V5000 is achieved with software and with thin provisioning, and is designed to become an almost entirely automated function. Without Storwize V5000, server provisioning could be slowed by the need to provision storage.

Containers are an open-source technology that lets software be packaged with everything it needs to run the same in any environment. Containers offer the versatility of virtual machines, but at a much smaller footprint and cost. As a result, containerization is a key enabling technology for flexibly delivering workloads to private and public cloud and DevOps. Using the IBM storage container plug-in framework, Storwize V5000 enables any supported storage to be used as persistent storage in Docker and Kubernetes container environments, improving flexibility, simplifying deployment and lowering costs while offering clients the confidence of deploying stateful containers using highly available storage with enterprise capabilities.

Take advantage of additional features

In addition, Storwize V5000 includes:

- Innovative management capabilities, to ease storage management
- High availability configurations with IBM HyperSwap® for Storwize V5030
- FlashCopy® function and remote mirroring to create copies of data for back up and disaster recovery
- Dual clustering for Storwize V5030, to enable growth from smaller configurations
- High-density expansion enclosures, which can hold up to 92 drives and 1.4 PB in a 5U form factor.
- The option to add IBM Spectrum Virtualize for Public Cloud software to enable new opportunities to migrate data between on-premises and public cloud storage as well as enabling use of public cloud for disaster recovery
- Support for OpenStack Cinder driver, which helps automate storage provisioning and volume management for organizations by combining the efficiency of Storwize V5000 with the OpenStack Compute cloud platform

IBM Storwize V5000 at a glance

Software	IBM Spectrum Virtualize software for Storwize V5030	IBM Spectrum Virtualize software for Storwize V5020	IBM Spectrum Virtualize software for Storwize V5010
User interface	Web-based GUI	Web-based GUI	Web-based GUI
Single or dual controller	Dual	Dual	Dual
Connectivity (standard)	10 Gb iSCSI 1 Gb iSCSI	12 Gb SAS 1 Gb iSCSI	1 Gb iSCSI
Connectivity (optional)	16 Gb Fibre Channel 12 Gb SAS 25 Gbps iSCSI 10 Gb iSCSI/Fibre Channel over Ethernet (FCoE) 1 Gb iSCSI	16 Gb Fibre Channel 12 Gb SAS 25 Gbps iSCSI 10 Gb iSCSI/FCoE 1 Gb iSCSI	16 Gb Fibre Channel 12 Gb SAS 25 Gbps iSCSI 10 Gb iSCSI/FCoE 1 Gb iSCSI

IBM Storwize V5000 at a glance

Cache (per system)	32 GB or 64 GB	16 GB or 32 GB	16 GB
Drives supported	Small form-factor 2.5-inch disk drives: • 300 GB, 600 GB @ 15k rpm • 900 GB, 1.2 TB, 1.8 TB and 2.4 TB @ 10k rpm • 2 TB @ 7.2k rpm SAS nearline • Large form-factor 3.5-inch disk drives: • 300 GB, 600 GB, 900 GB @ 15k rpm, SAS (2.5-inch drive in a 3.5-inch drive carrier) • 900 GB, 1.2 TB, 1.8 TB @ 10k rpm, SAS (2.5-inch drive in a 3.5-inch drive carrier) • 2 TB, 3 TB, 4 TB, 6 TB, 8 TB, 10 TB, 12 TB @ 7.2k rpm • 2.5-inch flash drives: • 400 GB, 800 GB, 1.6 TB, 1.92 TB, 3.2 TB, 3.84 TB, 7.68 TB and 15.36 TB	Small form-factor 2.5-inch disk drives: • 300 GB, 600 GB @ 15k rpm • 900 GB, 1.2 TB, 1.8 TB and 2.4 TB @ 10k rpm • 2 TB @ 7.2k rpm SAS nearline • Large form-factor 3.5-inch disk drives: • 300 GB, 600 GB, 900 GB @ 15k rpm, SAS (2.5-inch drive in a 3.5-inch drive carrier) • 900 GB, 1.2 TB, 1.8 TB @ 10k rpm, SAS (2.5-inch drive in a 3.5-inch drive carrier) • 2 TB, 3 TB, 4 TB, 6 TB, 8 TB, 10 TB, 12 TB @ 7.2k rpm • 2.5-inch flash drives: • 400 GB, 800 GB, 1.6 TB, 1.92 TB, 3.2 TB, 3.84 TB, 7.68 TB and 15.36 TB	Small form-factor 2.5-inch disk drives: • 300 GB, 600 GB @ 15k rpm • 900 GB, 1.2 TB, 1.8 TB and 2.4 TB @ 10k rpm • 2 TB @ 7.2k rpm SAS nearline • Large form-factor 3.5-inch disk drives: • 300 GB, 600 GB, 900 GB @ 15k rpm, SAS (2.5-inch drive in a 3.5-inch drive carrier) • 900 GB, 1.2 TB, 1.8 TB @ 10k rpm, SAS (2.5-inch drive in a 3.5-inch drive carrier) • 2 TB, 3 TB, 4 TB, 6 TB, 8 TB, 10 TB, 12 TB @ 7.2k rpm • 2.5-inch flash drives: • 400 GB, 800 GB, 1.6 TB, 1.92 TB, 3.2 TB, 3.84 TB, 7.68 TB and 15.36 TB
Maximum drives supported	Maximum of 760 drives per system and 1,520 drives in two-way clustered: • Small form-factor enclosure: 24 x 2.5-inch drives • Large form-factor enclosure: 12 x 3.5-inch drives • High-density expansion enclosure: 92 x 3.5-inch drives	Maximum of 392 drives per system: • Small form-factor enclosure: 24 x 2.5-inch drives • Large form-factor enclosure: 12 x 3.5-inch drives • High-density expansion enclosure: 92 x 3.5-inch drives	Maximum of 392 drives per system: • Small form-factor enclosure: 24 x 2.5-inch drives • Large form-factor enclosure: 12 x 3.5-inch drives • High-density expansion enclosure: 92 x 3.5-inch drives
Maximum expansion enclosure capacity	• Standard expansion enclosures: up to 20 standard expansion enclosures per controller • High-density expansion enclosures: up to 8 high-density expansion enclosures per controller	• Standard expansion enclosures: up to 10 standard expansion enclosures per controller • High-density expansion enclosures: up to 4 high-density expansion enclosures per controller	• Standard expansion enclosures: up to 10 standard expansion enclosures per controller • High-density expansion enclosures: up to 4 high-density expansion enclosures per controller
RAID levels	RAID 0, 1, 5, 6, 10, Distributed	RAID 0, 1, 5, 6, 10, Distributed	RAID 0, 1, 5, 6, 10, Distributed

IBM Storwize V5000 at a glance

Fans and power supplies	Fully redundant, hot-swappable	Fully redundant, hot-swappable	Fully redundant, hot-swappable
Rack support	Standard 19-inch	Standard 19-inch	Standard 19-inch
Advanced functions included with each system	• Embedded GUI • Virtualization of internal storage • Data reduction pools with thin provisioning, unmap and deduplication • One-way data migration • Dual-system clustering	• Embedded GUI • Virtualization of internal storage • Data reduction pools with thin provisioning and unmap • One-way data migration	• Embedded GUI • Virtualization of internal storage • Data reduction pools with thin provisioning and unmap • One-way data migration
Additional available advanced functions	• Easy Tier • Compression • FlashCopy • Remote mirroring • Encryption • External virtualization	• Easy Tier • FlashCopy • Remote mirroring • Encryption	• Easy Tier • FlashCopy • Remote mirroring
Size*	8.7 cm (3.4 in.) H x 48.3 cm (19.0 in.) W x 55.6 cm (21.9 in.) D • Approximate weight: – Large form-factor control enclosure: ❍ Empty: 18.0 kg (39.6 lb) ❍ Fully configured: 28.3 kg (62.2 lb) – Large form-factor expansion enclosure: ❍ Empty: 16.4 kg (36.1 lb) ❍ Fully configured: 26.7 kg (58.8 lb) – Small form-factor control enclosure: ❍ Empty: 19.0 kg (41.8 lb) ❍ Fully configured: 27.3 kg (60.0 lb) – Small form-factor expansion enclosure: ❍ Empty: 16.7 kg (36.7 lb) ❍ Fully configured: 25.0 kg (55.2 lb)	8.7 cm (3.4 in.) H x 48.3 cm (19.0 in.) W x 55.6 cm (21.9 in.) D • Approximate weight: – Large form-factor control enclosure: ❍ Empty: 18.0 kg (39.6 lb) ❍ Fully configured: 28.3 kg (62.2 lb) – Large form-factor expansion enclosure: ❍ Empty: 16.4 kg (36.1 lb) ❍ Fully configured: 26.7 kg (58.8 lb) – Small form-factor control enclosure: ❍ Empty: 19.0 kg (41.8 lb) ❍ Fully configured: 27.3 kg (60.0 lb) – Small form-factor expansion enclosure: ❍ Empty: 16.7 kg (36.7 lb) ❍ Fully configured: 25.0 kg (55.2 lb)	8.7 cm (3.4 in.) H x 48.3 cm (19.0 in.) W x 55.6 cm (21.9 in.) D • Approximate weight: – Large form-factor control enclosure: ❍ Empty: 18.0 kg (39.6 lb) ❍ Fully configured: 28.3 kg (62.2 lb) – Large form-factor expansion enclosure: ❍ Empty: 16.4 kg (36.1 lb) ❍ Fully configured: 26.7 kg (58.8 lb) – Small form-factor control enclosure: ❍ Empty: 19.0 kg (41.8 lb) ❍ Fully configured: 27.3 kg (60.0 lb) – Small form-factor expansion enclosure: ❍ Empty: 16.7 kg (36.7 lb) ❍ Fully configured: 25.0 kg (55.2 lb)

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Operating environment	• Air temperature: – Operating: 10°C – 35°C (50°F – 95°F) at 30.5 m below to 3,000 m above sea level (100 ft. below to 9,840 ft. above) – Non-operating: -10°C – 50°C (14°F – 125°F) • Relative humidity: – Operating: 20% – 80% – Non-operating: 10% – 90%	• Air temperature: – Operating: 10°C – 35°C (50°F – 95°F) at 30.5 m below to 3,000 m above sea level (100 ft. below to 9,840 ft. above) – Non-operating: -10°C – 50°C (14°F – 125°F) • Relative humidity: – Operating: 20% – 80% – Non-operating: 10% – 90%	• Air temperature: – Operating: 10°C – 35°C (50°F – 95°F) at 30.5 m below to 3,000 m above sea level (100 ft. below to 9,840 ft. above) – Non-operating: -10°C – 50°C (14°F – 125°F) • Relative humidity: – Operating: 20% – 80% – Non-operating: 10% – 90%
Warranty	Hardware: • Flexible warranty – One- or three-year warranty with 9 to 5 next-business-day response (dependent upon machine type) – Tier 1 customer-replaceable units and on-site repairs – Warranty service upgrades available • Post-warranty support available • Customer setup (initial installation and field upgrades) Software: • Initial license purchase Software maintenance agreement available	Hardware: • Flexible warranty – One- or three-year warranty with 9 to 5 next-business-day response (dependent upon machine type) – Tier 1 customer-replaceable units and on-site repairs – Warranty service upgrades available • Post-warranty support available • Customer setup (initial installation and field upgrades) Software: • Initial license purchase Software maintenance agreement available	Hardware: • Flexible warranty – One- or three-year warranty with 9 to 5 next-business-day response (dependent upon machine type) – Tier 1 customer-replaceable units and on-site repairs – Warranty service upgrades available • Post-warranty support available • Customer setup (initial installation and field upgrades) Software: • Initial license purchase Software maintenance agreement available
Supported systems	For a list of currently supported servers, operating systems, host bus adapters, clustering applications, and SAN switches and directors, refer to the IBM System Storage Interoperation Center at: **ibm.com**/systems/support/storage/config/ssic	For a list of currently supported servers, operating systems, host bus adapters, clustering applications, and SAN switches and directors, refer to the IBM System Storage Interoperation Center at: **ibm.com**/systems/support/storage/config/ssic	For a list of currently supported servers, operating systems, host bus adapters, clustering applications, and SAN switches and directors, refer to the IBM System Storage Interoperation Center at: **ibm.com**/systems/support/storage/config/ssic
ISV solutions	For a list of high-quality solutions with IBM partner ISVs, including access to solution briefs and white papers, refer to the ISV Solutions Resource Library	For a list of high-quality solutions with IBM partner ISVs, including access to solution briefs and white papers, refer to the ISV Solutions Resource Library	For a list of high-quality solutions with IBM partner ISVs, including access to solution briefs and white papers, refer to the ISV Solutions Resource Library

Why IBM?

The Storwize family of products from IBM, a recognized leader in the storage industry, is known for providing efficiency and high-performance storage for almost any type of workload. IBM storage offerings customized for small, midsized and large organizations are designed to deliver sophisticated capabilities that help control costs for growing businesses.

For more information

To learn more about IBM Storwize V5000, please contact your IBM representative or IBM Business Partner, or visit: **ibm.com**/us-en/marketplace/storage-consolidation

To learn more about IBM Storwize V5030F all-flash, please contact your IBM representative or IBM Business Partner, or visit: **ibm.com**/us-en/marketplace/external-virtualization

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Actual available storage capacity may be reported for both uncompressed and compressed data and will vary and may be less than stated.

* To assure installation and serviceability in non-IBM industry-standard racks, review the installation planning information for any product-specific installation requirements.

[1] IBM lab measurements – August 2017.

[2] Available only in Storwize V5030.

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