IBM

IBM FlashSystem 5200 | Data sheet

Highlights

- Affordably accelerate workloads in only 1U

- Enhance cyber resilience without compromising application performance

- Leverages the power of IBM Spectrum® Virtualize for rich data services

- Benefit from hybrid cloud storage capabilities to increase business agility

- Extend wide-ranging data services across hundreds of external systems

- Rely on powerful AI-enhanced tools to optimize storage operations

- Deliver rock-solid data resilience and business continuance

Bringing NVMe-accelerated storage performance and new levels of cost-efficiency to smaller deployments in enterprises of all sizes

Startup companies, entry-level enterprises, remote offices, and network edge locations – these are the most common business environments around the world, by far. They may not have thousands of employees, but they are still adopting the same technologies as their larger competitors – hybrid cloud architectures, real-time analytics, artificial intelligence (AI), and blockchain, among many others. And they still require IT infrastructure that provides great flexibility and scalability, wide-ranging data services, seamless movement within cloud architectures, speed, and perhaps most importantly — data resilience from potential threats.

For enterprises more sensitive to affordability, it is especially important to be able to start with small capital investments and add capabilities and components as their business and IT requirements grow.

These are the types of organizations that turn to IBM FlashSystem 5200. This compact member of the IBM FlashSystem family of leading-edge storage systems offers the same levels of functionality as other family members – but in an efficient smaller form factor that enables enterprises to start with a very modest initial storage investment without sacrificing performance and then easily expand capacity and capabilities as needs grow and change.

IBM FlashSystem 5200

A family of cost-efficient, high-performance storage solutions

The IBM FlashSystem family has evolved and adapted to changing requirements – single platform approach, better flash management and durability, hardware-driven data reduction and encryption, IBM FlashCore® technology innovation, new hybrid cloud capabilities, and incorporation of NVMe, among many other changes. The major improvements have been towards simplicity, cost-efficiency, density, and blazing fast performance.

IBM FlashSystem storage solutions are:

- Starting on FlashSystem 5200, the family is NVMe-accelerated with control enclosures that are end-to-end NVMe-enabled, with flexibility to choose and mix between FlashCore Modules, industry standard NVMe drives and storage-class memory. The systems offer industry-leading performance and scalability with support for bare-metal, virtual, and containerized environments.

- Built with IBM Spectrum Virtualize, which delivers a full range of industry-leading data services such as dynamic tiering, IBM FlashCopy® management and data mobility among many other advanced data management features.

- Ready for hybrid cloud, with support for private, hybrid, or public cloud deployments. The solutions come with ready-to-use, proven, validated "cloud blueprints".

- Designed to address rising cyber threats with high-performance data encryption, by isolating immutable data copies with Safeguarded Copy, and speeding recovery with IBM FlashSystem Cyber Vault.

- IBM Storage support for Ansible® -- the Red Hat® open source IT configuration management and automation platform continue to be enhanced including automation for HyperSwap® for high availability configurations for mission-critical workloads.

- Cost-efficient, with innovative data reduction pool (DRP) technology that includes deduplication and hardware-accelerated compression technology[1], plus SCSI UNMAP support and all the thin provisioning, copy management, and efficiency you'd expect from IBM Spectrum Virtualize-based storage

- Supporting hybrid storage, with multiple expansion enclosure options based on 12 Gb/s SAS that support both solid state drives (SSD) and hard disk drives (HDD)[2]

- AI-enhanced through the IBM Storage Insights analytics, resource management, and support platform. Plus, IBM Spectrum Virtualize functionality includes AI-based data placement for optimal data center performance and zero-downtime data migration.

IBM FlashSystem 5200 is the most compact storage system ever produced by IBM. It is designed to accelerate a wide range of enterprise deployments with bare metal, virtualized, or containerized servers. Leveraging IBM Spectrum Virtualize, IBM Storage Insights software and end-to-end NVMe protocols, these new systems bring the performance and functionality needed for almost any workload, delivering a lot more work using fewer drives and rack space than traditional SAS or even traditional flash systems, with as low as 50 microseconds latency[3], as much as 1 petabytes of effective capacity in only one rack unit, HyperSwap high availability technology, 3-site replication, scalability and data reduction.

Powerful to the core

FlashSystem 5200 brings all the simplicity and innovation of other family members, then adds an extremely important new capability – entry-level NVMe all-flash flexibility and affordability. IBM FlashSystem 5200 offers storage solutions that are simple enough for every environment; powerful enough for all environments.

It's time to revolutionize the entry-enterprise storage space. IBM FlashSystem 5200 introduces affordable end-to-end NVMe systems that allows enterprises of all sizes to start "small" and grow as their business requires in both performance and capacity. A single FlashSystem 5200 with only three NVMe FlashCore Modules (FCM), delivers the same throughput as a system with twenty-four SAS SSDs. And, like all IBM FlashSystem models, it also leverages IBM Spectrum Virtualize for data management and hybrid cloud functionality.

The basic system is comprised of an NVMe dual controller 1U control enclosure that can support up to 12 FCM, industry standard SSDs, or storage-class memory drives. These drive technologies can be mixed in the same chassis and come in various sizes that provide up to 460TB of raw storage capacity and 1PB effective capacity within a single 1U system. Up to 512GB of controller cache is available with multiple 16/32 Gbps fibre channel, 12 Gbps SAS, or 10/25 Gbps Ethernet I/O adapters with iSCSI and NVMe RDMA options. The systems allow clustering for scale up to the multi-petabyte range, and the capability to connect up to 20 SAS expansion enclosures per system for nearly limitless scale out options.

IBM FlashSystem 5200 leverages the advantages of IBM FlashCore storage media that provides greater flash density and higher capacity than any industry-standard flash drives. Purpose-engineered FCMs utilize powerful inline, hardware-accelerated data compression and

encryption technologies that provide consistent compression and encryption across the full range of workloads – with no performance penalties. IBM invented several technologies to make QLC perform and endure as well as TLC. FCMs use QLC combined with dynamic SLC allocation, smart data placement (hotter read data placed on lowest latency pages) and read heat assessment. QLC enables a 38.4TB module (densest NVMe SSD in the industry). New FCM generation 3 includes improved compression capability that supports up to 116TB in a single FCM drive. Additionally, FCM 3s are planned to provide Federal Information Processing Standard (FIPS) 140-3 Level 1 encryption with IBM Security Key Lifecycle Manager or Gemalto SafeNet KeySecure centralized key management and full hot-swap capabilities.

IBM FlashSystem 5200 can operate in distributed RAID (DRAID) 1, 5, or 6 modes. A key advantage is its ability to operate at full DRAID protection and efficiency with only three drives. This means that cost-sensitive users can start with a smaller capital expenditure and add capacity as needed. IBM DRAID 1 data can be read from all three drives, which provides a performance boost over traditional RAID 1 approaches, as well as allowing full recovery with loss of one drive. And assuming DRAID 1, the systems can achieve a maximum 1.5 million input/outputs per second (IOPS), minimum 50 microsecond latency, and 21 GB/s throughput.

Award-winning capabilities

All IBM FlashSystem solutions leverage the proven capabilities of IBM Spectrum Virtualize software-defined storage (SDS) for data and storage management. IBM Spectrum Virtualize has been helping enterprises improve infrastructure flexibility and data economics for more than 15 years. It offers an industry-leading spectrum of features and functionality, including enhanced cloud functionality, comprehensive data reduction, and support for leading-edge container technologies that can provide enterprises with the capabilities they need to capture and keep competitive advantage across the full spectrum of modern business environments.

IBM Spectrum Virtualize delivers a full range of sophisticated storage functionality, including:

- IBM HyperSwap for non-disruptive application and data mobility between data centers

- Support for host-side virtualization solutions, including VMware virtual machines, Microsoft Hyper-V, and IBM PowerVM, among others

- Support for more than 500 external, heterogeneous storage systems from a wide variety of vendors

- Powerful DRP technology that includes deduplication, compression, and automated thin provisioning

- IBM Easy Tier® AI-driven automated tiering functionality

- Safeguarded Copy for isolated and immutable copies plus software-based encryption that can be extended across all managed systems

- IBM FlashCopy and IBM Remote Mirror for local and remote three-site replication

IBM FlashSystem 5200 solutions can lower both capital expenditures and operational costs by extending a rich set of data services across existing heterogeneous external storage or by adding SAS drive expansion enclosures, thanks to the extensive AI-enhanced storage resource management, predictive analytics, automated support, and data placement provided by IBM Spectrum Virtualize. Once under IBM Spectrum Virtualize management, data in external storage systems becomes part of the IBM FlashSystem solution and can be managed in the same way as internal drives. External systems inherit all the IBM Spectrum Virtualize functional richness and ease-of-use features incorporated into the IBM FlashSystem 5200 platform, including advanced replication, high-performance thin provisioning, encryption, isolated and immutable copies, compression, deduplication, and Easy Tier functionality that improve administrator productivity and boost storage utilization while also enhancing and extending the value of existing storage investments.

HyperSwap functionality enables a pair of IBM FlashSystem 5200 systems to support servers in multiple data centers. When combined with server data mobility functions such as VMware vMotion or IBM PowerVM Live Partition Mobility, HyperSwap enables nondisruptive storage and VM mobility between data centers up to 300 km (186 miles) apart. IBM Spectrum Virtualize three-site replication capability runs data copies at both metro and global distances to offer a variety of recovery point and time options.

Designed for cost-efficiency

IBM FlashSystem 5200 is not only compact with low total cost of ownership (TCO), the high density of FCM drives and the data reduction options within IBM Spectrum Virtualize help transform the economics of data storage. When DRP is applied to new or existing storage, they can significantly increase usable capacity while maintaining consistent application performance. This can substantially reduce costs for storage acquisition, rack space, power, and cooling, while extending the useful life of existing storage assets. DRP capabilities include:

- Block deduplication that works across all the storage in a DRP to minimize the number of identical blocks

- Compression technology that provides consistent performance across application workload patterns

- SCSI UNMAP support that de-allocates physical storage when operating systems delete logical storage constructs such as files in a file system

In addition to built-in cost-efficiency features, IBM FlashSystem 5200 capacity can be procured using the IBM Storage Utility pricing model. This offering allows you to predict monthly data capacity costs and only pay for the capacity you need, whether your data grows or shrinks. No need to over-purchase or lease large amounts of capacity for "just in case" needs. Simply use the data that your business needs and the IBM Storage Utility offering will take care of the rest.

Simplified management

IBM FlashSystem 5200 is designed to be easy to use from the very start. The innovative user interface enables administrators to perform configuration, management, and service tasks in a consistent manner over multiple storage systems — even from different vendors — vastly simplifying management and helping reduce the risk of errors. Plug-ins to support VMware vCenter help enable more efficient, consolidated management while a REST API and Ansible support help enable automated operations.

IBM Storage Inisghts in the cloud and IBM Spectrum Control on premises provide organizations with an end-to-end view of storage health, long-term performance analytics and capacity statistics for IBM FlashSystem 5200 and the surrounding storage infrastructure.

Rock solid data resilience

IBM Spectrum Virtualize in FlashSystem storage solutions also provides enterprise-grade system availability and data security features that include nondisruptive data migration and remote mirroring using IBM HyperSwap technology, plus "six nines" availability, isolated and immutable data copies, hardware-accelerated data-at-rest encryption, and an IBM distributed RAID technology that can reduce disk rebuild times substantially compared to traditional RAID solutions. The systems leverage the cost advantages of multiple flash drive options and feature an intuitive user interface, synchronous/asynchronous replication, and more than 600 application programming interfaces (APIs). Plus, IBM FlashSystem provides affordable, nondisruptive upgrade paths that deliver increased performance, scalability, and functionality.

As systems became linked with external networks, organizations are adopting a "defense-in-depth" security mode so that if the perimeter was breached, there were additional layers of security to protect critical information. IBM FlashSystem 5200 provides advanced capabilities that can help maximize data protection, security, and high availability to significantly reduce the risk of disruption and financial losses due to user errors, malicious destruction, or ransomware attacks. FlashSystem 5200 delivers the capability to enable this level of protection while also delivering high performance for applications.

With Safeguarded Copy, IBM protects your valued data form cyberattacks with immutable and isolated copies that are hidden, non-addressable and cannot be altered or deleted. In the event

of an attack, these copies can be quickly restored to support recovery. Customized to your particular application mix, IBM FlashSystem Cyber Vault builds on IBM Safeguarded Copy to help reduce cyber attack recovery times from days to hours. In addition, physical isolation layers can also be created by storing sensitive copies in immutable storage, cloud environments or off-line write-once read many (WORM) tape devices to provide physical air-gap protection.

And with more organizations looking to adopt data resilience solutions that go beyond simple data backup and recovery, the IBM Spectrum Protect portfolio is the perfect complement for IBM FlashSystem. It provides unified end-to-end workload protection, both on-premises and in the cloud, including applications, VMs, file systems, SaaS workloads, AWS EC2 instances, and containers.

IBM FlashSystem 5200 provides advanced capabilities that can help maximize data protection, security and high availability to significantly reduce the risk of disruption and financial losses due to user errors, malicious destruction or ransomware attacks.

Greater storage visibility, insight, and control

Because data is the resource that drives your business, storage systems take on even greater importance. IBM Storage Insights and IBM Storage Insights Pro provide critical capabilities that enhance your experience with IBM Storage, including:

- 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

- Monitoring of Brocade and Cisco switches and fabrics to help identify saturation, congestion, and fabric errors that might impact your storage performance

- 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, AI-enhanced Storage Insights is quick and easy to set up and requires no ongoing software maintenance. Storage Insights Pro is an upgrade that provides more detailed information and additional capabilities. IBM Spectrum Control software provides similar capability for clients who prefer an on-premises solution.

Hybrid cloud, virtualized and container environments

The challenge for organizations these days is how to take advantage of hybrid cloud technology without the expense of replacing current storage with cloud-capable storage systems. IBM FlashSystem 5200, when combined with IBM Spectrum Virtualize for Public Cloud provides a consistent approach to the replication of heterogeneous storage between on-premises data centers and IBM Cloud, Amazon Web Services (AWS) or Microsoft Azure. It also provides the ability to use cloud capabilities for setting up a disaster-recovery target or for workload migration between on-premises and cloud-based resources. By leveraging IBM Spectrum Copy Data Management software, cloud storage may be used for data copies as well.

The IBM Spectrum Virtualize functionality in IBM FlashSystem 5200 complements server virtualization technologies such as PowerVM, Microsoft Hyper-V, and VMware vSphere.. Similar to provisioning virtualized servers, provisioning capacity with IBM FlashSystem 5200 is designed to become an almost entirely automated function.

Containers are an open-source technology that wraps applications with everything needed to run in any environment. Containerization is a key enabling technology for flexibly delivering workloads to private and public cloud and DevOps. IBM FlashSystem 5200 supports Red Hat OpenShift and Kubernetes container environments, accelerating the deployment of persistent volumes with the IBM block storage CSI driver, certified by Red Hat and IBM.

World-class support

IBM FlashSystem 5200 offers world-class customer support, product upgrade and guarantee programs:

- IBM Storage Expert Care service and support is simple. Select from basic or advanced support options and the period that best fits your needs with predictable and upfront pricing that is a fixed percentage of the system cost.

- The IBM Data Reduction Guarantee helps reduce planning risks and lower storage costs with baseline levels of data compression effectiveness in IBM Spectrum Virtualize-based offerings.

- The IBM Controller Upgrade Program enables customers of designated all-flash IBM storage systems to reduce costs while maintaining leading-edge controller technology for essentially the cost of ongoing system maintenance.

- The IBM High-Availability Guarantee helps enterprises avoid the costs and risks related to business downtime by ensuring the availability of business-critical data and storage systems.

[1]HW accelerated compression starts with FlashSystem 5200.

[2] IBM FlashSystem 9500 and 9500R are only all-flash models.

[3] Based on IBM internal analysis, February 2021. Actual performance results will vary.

IBM Flashsystem 5200 at a glance

Models	IBM FlashSystem 5200
Host interface	10 Gbps Ethernet (iSCSI), 25/10 Gbps Ethernet (iSCSI and NVMe RDMA) 16 Gbps Fibre Channel (FC, FC-NVMe), 32 Gbps Fibre Channel (FC, FC-NVMe)
User interface	IBM Spectrum Virtualize web GUI and CLI
Supported drives	2.5-inch NVMe FlashCore Modules (FCM): • 4.8 TB, 9.6 TB, 19.2 TB and 38.4 TB self-compressing FCM 2.5-inch NVMe flash drives - industry standard: • 800 GB, 1.92 TB, 3.84 TB, 7.68 TB, 15.36 TB, and 30.72 TB Storage Class Memory (SCM): • 375 GB, 750 GB, 800 GB, 1.6 TB
Max IOPs	1.5M IOPs
Min Latency	Under 50µs
Max Bandwidth	21 GB/s
RAID levels	Distributed RAID 1, 5 and 6
Maximum drives supported	748 per control enclosure; 2,992 per clustered system IBM FlashSystem 5200 control enclosures support the following expansions: • 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
Fans and power supplies	Fully redundant, hot-swappable
Rack support	1U - 19-inch” / 29" depth enclosure
Cores per control enclosure/clustered system	16/64
Cache per control enclosure/clustered system	64 or up to 512 GB/256 GB or up to 2.04 TB
Management software	IBM Spectrum Virtualize licensed machine code
Advanced features included with each system	• Virtualization of internal storage • Data migration • Data Reduction Pools with thin compression, deduplication, and thin provisioning • UNMAP • Remote mirroring • Easy Tier • FlashCopy

Additional available advanced features	• External virtualization • Encryption • IBM FlashSystem Cyber Vault • IBM Storage Insights Pro • IBM Spectrum Virtualize for Public Cloud • IBM Spectrum Control • IBM Spectrum Protect • IBM Spectrum Protect Plus

Warranty	FlashSystem 5200 (4664) Hardware Warranty:
	
	• 1-year limited warranty
	• 9 x 5 on-site limited support
	• Upgradeable to IBM Storage Expert Care:
	  ◦ IBM Storage Expert Care Basic:
	    ■ Extended 9 x 5 on-site hardware support for the duration of the contract
	    ■ License machine code subscription and support for the duration of the contract
	    ■ Guidance on installation, usage and configuration
	    ■ Automated ticket management and alerting
	  ◦ IBM Storage Expert Care Advanced:
	    ■ Extended 24 x 7 on-site hardware support for the duration of the contract
	    ■ License machine code subscription and support for the duration of the contract
	    ■ Guidance on installation, usage and configuration
	    ■ Automated ticket management and alerting
	    ■ Predictive issue resolution
	
	Software Warranty:
	
	IBM Spectrum Virtualize licensed machine code governed by the IBM Agreement for Machine Code
	
	• Included with the machine's warranty
	• Extended through hardware support via IBM Storage Expert Care

Replication services	• FlashCopy • Metro Mirror (synchronous) and Global Mirror (asynchronous)
Control enclosure dimensions	• Height: 4.3 cm (1.7 in.) • Width: 44.6 cm (17.5 in.) (19 in. rack standard) • Depth: 77.0 cm (30.3 in.)
Control enclosure weight	• Fully configured (12 drive modules installed): 19.5 kg (43.0 lb)
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. https://www.ibm.com/systems/support/storage/ssic/interoperability.wss
Independent software vendor (ISV) solutions	For a list of high-quality solutions with our partner ISVs, including access to solution briefs and white papers, refer to the ISV Solutions Resource Library. https://www.ibm.com/partnerworld/wps/pub/systems/whyibm/programs

Performance numbers are based on IBM internal analysis, February 2021. Actual performance results will vary.

IBM

Why IBM?

Powerful all-flash block storage solutions that provide affordable, high-performance enterprise-grade functionality for businesses of all sizes. Unique IBM FlashCore Modules provide unparalleled density, endurance, and performance. Built with IBM Spectrum Virtualize and the AI-powered storage management and proactive support of IBM Storage Insights, FlashSystem delivers consistent rich data services across on-premises, hybrid cloud, containerized or virtualized environments.

For more information

Visit our solutions page to learn more about the FlashSystem family of data systems, or contact your IBM representative or IBM Business Partner. If you need to be connected, fill out this form to schedule a consult with an IBM storage expert.

Additionally, IBM Global Financing provides numerous payment options to help you acquire the technology you need to grow your business. We provide full lifecycle management of IT products and services, from acquisition to disposition. For more information, visit: ibm.com/financing

IBM Spectrum®

Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.