IBM FlashSystem V9000

All-flash arrays offering industry-leading performance, agile integration and enduring economics

Highlights

- Accelerate critical applications with the scalable performance of IBM® FlashCore™ technology

- Deploy all-flash storage for less than the cost of hard-disk drives (HDDs) with IBM Real-time Compression™

- Harness the power of data using storage virtualization powered by the ultra-low response times of IBM MicroLatency™

- Accelerate time to value with agile, easy-to-implement, fully-integrated systems

- Protect your data with a full suite of disaster-recovery tools including snapshots, clones and replication

- Achieve advanced virtualization, provisioning and performance management with IBM Virtual Storage Center

Today, IT infrastructure is fully entwined with basic business operations, which means that crucial business questions become information technology questions. What is it worth to stay ahead of the competition? What is a better online customer experience worth to the bottom line? What advantages are gained by making faster, more informed business decisions? Can we afford not to have the best possible fraud protection and data security? When you answer these business-critical questions in terms of IT infrastructure, and recognize the crucial role storage plays in the right answers, then the value of IBM FlashSystem® skyrockets.

IBM FlashSystem V9000 offers the advantages of software-defined storage at the speed of flash. These all-flash storage systems deliver the full capabilities of IBM FlashCore technology hardware-accelerated I/O, IBM MicroLatency modules, and advanced flash management coupled with a rich set of the features found in the most advanced software-defined storage solutions—including Real-time Compression, dynamic tiering, thin provisioning, snapshots, cloning, replication, data copy services and high-availability configurations.

Flash realized

IBM FlashSystem V9000 is designed to accelerate all types of applications and infrastructures. However, it is most often deployed to support high-performance database applications, such as IBM DB2® and those from Oracle or SAP, and to replace existing Tier 1 storage constrained by slow disk drives. By accelerating multiple workloads—both physical and virtual—IBM FlashSystem V9000 can help organizations reduce costs, increase revenue and improve customer satisfaction. Based on more than 70 patents, Real-time Compression offers up to 5:1 data reduction and can deliver flash for less than the cost of a disk array.[1] Compression is not recommended for every workload; therefore, IBM allows compression to be implemented on a per-volume basis.

IBM FlashSystem V9000 can function as a feature-rich, software-defined storage layer that virtualizes and extends the functionality of all managed storage. In this capacity, it acts as the virtualization layer between the host and other external storage systems, providing flexibility and extending functionality to the virtualized external storage capacity. Up to 32 PB of external storage can be managed by a single IBM FlashSystem V9000 array, and because the storage is virtualized, volumes can be nondisruptively moved between external and internal storage capacity. This functionality enables very agile integration into existing storage environments with seamless data migration between IBM FlashSystem V9000 and legacy storage systems.

IBM FlashSystem V9000 can take the place of multiple racks of HDDs—lowering your power, space and cooling costs. Plus, it can increase server efficiency, which can further cut power and cooling costs and reduce software licensing expenses. When using Real-time Compression for active data sets, IBM FlashSystem V9000 can increase the effective capacity of your flash storage up to five times.

To make your entire storage environment easier to manage while preserving your investments in legacy storage, IBM FlashSystem V9000 offers:

- **Storage virtualization technology:** Helps you manage other IBM or third-party storage arrays. The software-defined storage capabilities of IBM FlashSystem V9000 include optional IBM Virtual Storage Center. Virtual Storage Center can help slow storage growth and lower infrastructure costs through powerful features and capabilities such as end-to-end storage virtualization, real-time data compression, IBM Easy Tier® storage analytics and IBM FlashCopy® Manager for application-aware snapshots.
- **Scalable performance:** Allows flash capacity to be added (scaled up) to support multiple applications, the virtualized system to be expanded (scaled out) to support higher I/O operations per second (IOPS) and bandwidth, or the solution to be simultaneously scaled up and out to improve capacity, IOPS and bandwidth while maintaining MicroLatency.
- **Agile integration:** Enables enterprises to tailor storage deployment architectures to specific workloads, including data access that bypasses the storage virtualization layer for low latency, data access via Easy Tier, data compression using Real-time Compression and data replication to disaster-recovery sites.

IBM FlashSystem V9000 at a glance

IBM FlashSystem V9000 – base configuration

Models	9846/8-AC2, 9846/8-AE2
Flash type	IBM-enhanced MLC
Flash module configuration	4 x 1.2 TB, 6 x 1.2 TB, 8 x 1.2 TB, 10 x 1.2 TB, 12 x 1.2 TB, 6 x 2.9 TB, 8 x 2.9 TB, 10 x 2.9 TB, 12 x 2.9 TB, 6 x 5.7 TB, 8 x 5.7 TB, 10 x 5.7 TB, 12 x 5.7 TB
Maximum storage capacity	Internal storage enclosure(s): Scalable from 2.2 TB (usable) up to 456 TB (usable) with full scale-out of control enclosures Effective internal: From 11 TB to 2.2 PB with full scale-out of control enclosures (at 80% reduction) External: Up to 32 PB usable capacity

Maximum performance – per building block (100% read, cache miss)

Minimum latency (4K)	200 µs
IOPS (4K)	630,000
Bandwidth (128K)	9.5 GB/s

Maximum performance – scaled out (100% read, 4 building blocks)

Latency (4K)	200 µs
IOPS (4K)	2,520,000
Bandwidth (128K)	30 GB/s
IOPS (4K) using Real-time Compression	1,200,000
RAS features	Two-dimensional flash RAID • Module-level IBM Variable Stripe RAID™ • System-level RAID 5 across modules Hot-swappable flash modules Tool-less module installation/replacement Concurrent code load Redundant and hot-swappable components
Encryption	Data-at-rest AES-XTS 256
IBM FlashSystem V9000 – host connectivity options	16 x 16/8/4 Gb Fibre Channel 8 x 10 Gb Fibre Channel over Ethernet (FCoE) 8 x 10 Gb iSCSI
Virtualization software model	5639-RB7
Shared SMP processor configuration	Two Intel Xeon E5 v2 Series eight-core processors
Processor memory	64 GB per engine
Dimensions (height x width x depth)	6U x 445 mm x 761 mm (6U x 17.5 in. x 29.96 in.)
Weight	78 kg (171.8 lb) fully loaded

IBM FlashSystem V9000 provides a comprehensive enterprise storage solution, but it does demand one thing from IT managers and end users—imagination. You must imagine Tier 0 and Tier 1 storage as one and the same. Imagine having the storage performance resources you need to be able to innovate as you wish—implementing a virtual desktop infrastructure, adding application features, leveraging new analytics capabilities. Storage is no longer a limiting factor; it is the enabling technology. And imagine all this extra capability at current disk pricing. Most importantly, imagine all the ways you can leverage this powerful new tool to create competitive advantages, make better business decisions, lower operating costs, detect and prevent fraud in real time, and innovate.

Why IBM?

Building on decades of storage leadership, IBM offers a comprehensive portfolio of integrated, flash-optimized storage solutions that can propel organizations into the next era of IT. These proven, easily integrated flash solutions accelerate critical applications for faster decision making, come with best-in-class reliability, and deliver new efficiencies across the entire business environment for a faster return on investment. IBM flash storage solutions can provide enterprises with the application performance they need to compete, innovate and grow.

For more information

To learn more about IBM FlashSystem V9000, please contact your IBM representative or IBM Business Partner, or visit the following website: **ibm.com**/storage/flash/V9000

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