# IBM FlashSystem V9000

*All-flash arrays offering versatile performance, agile integration and enduring economics*

## Highlights

- Harness the advantages of software-defined storage at the speed of flash memory
- Accelerate active data sets with the versatile performance of IBM® FlashCore™ technology
- Gain enduring flash economics through reduced capital investments today and lower operational expenses for years into the future
- Move into the cognitive era with agile cloud and analytics solutions that make fast storage simple
- Deploy market-leading virtualization and storage features, including IBM Real-time Compression™, dynamic tiering, thin provisioning, data copy services and high-availability configurations

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. This all-flash storage platform combines the high performance, ultra-low latency, superior efficiency and extreme reliability of IBM FlashCore technology with a rich set of virtualization and storage features such as dynamic tiering, thin provisioning, data copy services and high-availability configurations.

IBM FlashSystem V9000 is designed as a comprehensive storage solution for active data sets. It can help the cognitive business derive greater value from data assets, improve decision-making, and build agile cloud and analytics solutions. The platform includes powerful data reduction capabilities such as Real-time Compression, which is based on more than 70 patents. As a result, organizations can leverage flash for less than the cost of conventional enterprise storage.

## Flash everywhere

IBM FlashSystem V9000 accelerates the full range of applications and infrastructures. It can function as a feature-rich, software-defined storage layer that virtualizes and extends the functionality of managed storage. Up to 32 petabytes (PB) of external storage can be managed by a single IBM FlashSystem V9000 array,[1] and because the storage is virtualized, volumes can be non-disruptively 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 virtualize existing or new IBM FlashSystem arrays, allowing their feature sets and capabilities to be automatically leveraged across appropriate data volumes. This means that functionality such as the flash optimized data deduplication and compression provided by IBM FlashSystem A9000 can be combined with the powerful storage virtualization of IBM FlashSystem V9000 to create a robust, tiered solution for mixed workloads. Thus, organizations can achieve dramatic capacity and cost savings across the full range of enterprise application workloads.

IBM FlashSystem V9000 can take the place of multiple racks of disk-based storage—dramatically lowering power, space and cooling costs. Plus, it can increase server efficiency, reducing software licensing expenses and further cutting power and cooling costs. When using Real-time Compression for active data sets, IBM FlashSystem V9000 can increase the effective flash storage capacity up to five times.[1]

## A full spectrum of advantages

IBM FlashSystem V9000 leverages the capabilities of IBM Spectrum Virtualize™. This means that it can take advantage of deep integration with the IBM Spectrum Storage™ family of industry-leading software-defined storage solutions within addition to providing a wide range of storage services, functionality and virtualization capabilities, IBM Spectrum Virtualize technology enables IBM FlashSystem to integrate with many VMware application programming interfaces (API), which results in even more storage-side functionality, enhanced performance and coordinated management.

IBM FlashSystem V9000 integrates with VMware vStorage APIs for Array Integration (VAAI) and VMware vSphere APIs for Storage Awareness (VASA), as well as VMware Virtual Volumes. This agile integration with VMware environments enables enterprises of all sizes and types to derive greater value at lower cost from their information assets.

| **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<br>Effective internal: From 11 TB to 2.2 PB with full scale-out of control enclosures (at 80% reduction)<br>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<br>• Module-level IBM Variable Stripe RAID™<br>• System-level RAID 5 across modules<br>Hot-swappable flash modules<br>Tool-less module installation/replacement<br>Concurrent code load<br>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<br>8 x 10 Gb Fibre Channel over Ethernet (FCoE)<br>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 |

## 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

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 Systems
Route 100
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Produced in the United States of America
April 2016



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

[1] IBM lab measurements



IBM
Spectrum
Virtualize

TSD03189-USEN-04