



Highlights

- Maximize efficiency and flexibility with unique heterogeneous data services
 - Optimize performance with flash storage and automated tiering
 - Complement on-premises storage of all types with hybrid cloud capability
 - Use encryption to help improve security for data on existing storage systems
 - Transform the economics of data storage with hardware-accelerated data compression
 - Leverage integrated support for file and block data to consolidate workloads
 - Deploy storage quickly with easy-to-use management tools and built-in support for leading software platforms
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IBM Storwize V7000 Unified and Storwize V7000

Maximizing storage efficiency to transform the economics of data storage

To enter the new era of business, organizations need robust and agile storage solutions that can help them deliver more services faster and more efficiently, enable real-time insight and support more customer interaction. They need a storage infrastructure that can help them deploy their key business initiatives and let them capitalize on business opportunities.

Built with IBM® Spectrum Virtualize™ software—part of the IBM Spectrum Storage™ family—the IBM Storwize® family helps organizations support the workloads and applications that are critical to their success with feature-rich, enterprise-grade storage solutions. Storwize family systems can handle massive volumes of data, enable rapid and flexible cloud services deployments, and deliver the performance needed to gain insights from the latest analytics technologies with its all-flash or hybrid-flash solutions.

IBM Storwize V7000 Unified and IBM Storwize V7000 are virtualized, enterprise-class hybrid storage solutions that provide the foundation for implementing an effective storage infrastructure and transforming the economics of data storage. Designed to complement virtual server environments, these modular storage systems deliver the flexibility and responsiveness required for changing business needs.

In fact, IBM Spectrum Virtualize software in Storwize V7000 Unified and Storwize V7000 provides comprehensive storage services for unlocking the business value of stored data, including virtualization and



IBM Real-time Compression™. In addition, the solutions include a powerful platform and integration points to enable efficient, cost-effective hybrid cloud storage solutions. They are designed to deliver outstanding performance and efficiency for organizations of all sizes.

Data virtualization

Storwize V7000 Unified and Storwize V7000 use IBM Spectrum Virtualize data virtualization technology to help insulate applications from physical storage. This enables applications to run without disruption, even when changes are made to the storage infrastructure.

Storwize V7000 Unified and Storwize V7000 also extend data virtualization to heterogeneous 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, Real-time Compression and IBM Easy Tier®. Virtualizing external storage helps improve administrator productivity and boost storage utilization while also enhancing and extending the value of existing storage investments.

Moving data is one of the most common causes of planned downtime. Data virtualization enables moving data from existing storage into the new system or between arrays, while maintaining access to the data. This function might be used when replacing older storage with newer storage, as part of load-balancing work or when moving data in a tiered storage infrastructure from disk drives to flash.

Data virtualization can improve efficiency and business value. Nondisruptive migration can speed time-to-value from weeks or months to days, minimize downtime for migration, eliminate the cost of add-on migration tools, and may help avoid penalties and additional maintenance charges for lease extensions.

The result can be real cost savings to your business. Users who have deployed Storwize V7000 report a 29 percent improvement in application availability.¹



Hybrid cloud

IDC predicts that by 2017, more than 80 percent of enterprise IT organizations will commit to hybrid cloud architectures.² The challenge for these organizations is how to take advantage of hybrid cloud technology without the expense of replacing current storage with cloud-capable storage systems. IBM Spectrum Virtualize in Storwize V7000 enables use of cloud storage for data copies from any of almost 400 supported storage systems, dramatically speeding the ability to deploy hybrid cloud configurations while slashing the potential cost.

Real-time Compression

IBM Real-time Compression is designed to enable storing up to five times as much data in the same physical drive space by compressing data as much as 80 percent.³ Unlike other

approaches to compression, Real-time Compression is designed to be used with active primary data such as production databases and email systems, which dramatically expands the range of candidate data that can benefit from compression.

What's more, Real-time Compression with hardware acceleration transforms the economics of data storage. The benefits include reduced acquisition cost (because less hardware is required), reduced rack space, and lower power and cooling costs throughout the lifetime of the system. And, when combined with external data virtualization, Real-time Compression can significantly enhance the usable capacity of existing storage systems, extending their useful life even further.

High-performance, scalable platform

Storwize V7000 is designed to deliver flexible, affordable scaling and performance. A control enclosure contains dual redundant controllers, each with a 10-core 2.2 GHz Broadwell processor with 32 GB or 64 GB of cache. Each controller contains a hardware compression accelerator based on Intel QuickAssist technology with an available second accelerator. Flexible host interface options include 16 Gbps Fibre Channel, 1 Gbps iSCSI, and 10 Gbps iSCSI or Fibre Channel over Ethernet. Control enclosures support three models of expansion enclosures with 24 2.5-inch, 12 3.5-inch, and a new high-density enclosure with up to 92 3.5-inch or 2.5-inch drives. Each Storwize V7000 control enclosure supports up to 20 expansion enclosures or eight high-density enclosures attached using high-performance 12 Gbps SAS for a maximum capacity of 760 drives.

Clustered systems provide easy scale-out growth in performance and capacity with up to four controllers and associated expansion enclosures operating as a single storage system with 64 processor cores, up to 512 GB of cache, 3,040 drives and 32 PB of total capacity. And, to enable organizations to achieve advanced performance, IBM offers an all-flash model with



IBM Storwize V7000F, sharing the same platform and same code base to help you solve your unique business and IT requirements.

Storwize V7000 Unified systems also include dual redundant File Modules with 1 Gbps and 10 Gbps interfaces for network-attached storage (NAS) capability.

Efficiency

IBM Spectrum Virtualize software in Storwize V7000 Unified and Storwize V7000 is designed to deliver extraordinary levels of efficiency, helping to revolutionize data economics and drive down costs for cloud, analytics, virtual server and other enterprise-class deployments. The solution also delivers the performance needed for these demanding environments, so organizations no longer have to choose between performance and efficiency.

Traditional approaches to compression relegate its use to only less active and less performance-sensitive data, which limits the benefits and usability of compressed data. IBM Real-time Compression with hardware acceleration enables Storwize V7000 Unified and Storwize V7000 to deliver higher performance for compressed data than traditional systems offer for uncompressed data, enabling its use for practically all data types.⁴

In addition, automated storage tiering with IBM Easy Tier can help improve performance at a lower cost by enabling more efficient use of flash storage or multiple types of disk drives. Easy Tier automatically identifies more active data and moves that data to faster storage such as flash.⁵

Storwize V7000 Unified also features IBM Active File Management for automated, policy-based placement and tiering of file data—including flash, disk and tape tiers—for highly efficient, low-cost storage. Active File Management operates both within a single system and across systems at multiple locations, enabling automated placement of data closest to users. New integration with IBM Spectrum Scale™ allows file sharing between Storwize V7000 Unified and IBM Spectrum Scale under one single global name space.

When replicating block data for business continuity, Storwize V7000 Unified and Storwize V7000 can use IP network connections for simplicity and lower cost. Integrated Bridgeworks WANrockIT technology helps improve network utilization up to three times compared with traditional approaches,⁶ which can help reduce networking costs as well as accelerate replication cycles.

High availability

Clients are increasingly deploying virtualized servers using IBM PowerVM®, VMware and other technologies in high-availability configurations. Such configurations provide attractive options for high availability and load balancing.

The IBM HyperSwap® function supports storage and servers in two data centers. In this configuration, the solution enables servers at both data centers to access data concurrently with automated switch-over in case of failure. When combined with server data mobility functions such as VMware vMotion or PowerVM Live Partition Mobility, this configuration enables nondisruptive storage and virtual machine mobility between the two data centers, which can be up to 300 km (186 miles) apart.

In addition, Distributed RAID technology helps improve data availability by allowing data to be distributed across more physical drives that are used simultaneously, achieving faster rebuild time. This technology can also deliver increased performance since data can be read from/written to more drives for a given I/O.

Ease of use

Storwize V7000 Unified and Storwize V7000, using IBM Spectrum Virtualize software, are designed to be easy to use from the very start. For example, an intuitive management interface enables administrators to easily manage both block and file data in the same system. IBM Spectrum Control™ can also provide organizations with an end-to-end view of storage health, long-term performance analytics and capacity statistics for Storwize V7000 Unified, Storwize V7000 and the surrounding storage infrastructure.

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What's more, IBM Spectrum Virtualize technologies—including Real-time Compression, Easy Tier, IP replication with Bridgeworks WANrockIT technology and Active File Management—operate automatically and require little or no customization.

WANrockIT uses artificial intelligence technology to automatically optimize network use without any manual intervention. Because it's integrated into Storwize V7000 Unified and Storwize V7000, there are no separate appliances to manage.

Storwize V7000 Unified and Storwize V7000 also include storage pool balancing that operates automatically to distribute data across arrays in a pool—including external virtualized storage—to deliver balanced array performance and help eliminate the need for manual tuning.

In addition, Storwize V7000 Unified includes integrated support for IBM Spectrum Protect™, to simplify backups; restores; and application-aware, VMware-aware snapshots. It also supports the Network Data Management Protocol (NDMP) for backing up data with third-party applications.

Dependability

Storwize V7000 Unified and Storwize V7000 are part of the proven IBM Storwize family, with more than 281,000 enclosures and 5.3 exabytes of capacity deployed in organizations worldwide. An improved platform and unique compression accelerators using Intel QuickAssist technology deliver the power and flexibility required to support demanding cloud, analytics and virtual server environments.

For example, Storwize V7000 Unified combines both block and file storage into a single, dependable system. As a result, multiple management points can be eliminated, storage tiers—including flash—can be shared across all types of data, and data economics can be improved for a wide range of applications.

The unrelenting tide of data breaches continues to fuel an increasing interest in IBM self-encrypting storage, which automatically secures all information on a disk drive or tape cartridge when physically removed from a storage system. If a drive gets lost or stolen, data encryption renders data inaccessible. Storwize V7000 encryption also provides *cryptographic erasure*, a simple, cost-effective method for cleansing sensitive data from systems that are being retired or repurposed.

Support for Network File System (NFS) v4 and Server Message Block (SMB) 3.0 protocols, coupled with multi-tenancy support for file workloads, also enables consolidation with even more application types and deployment scenarios.

IBM Storwize V7000 Unified and Storwize V7000 storage systems at a glance

Maximum drives supported	760 per control enclosure; 3,040 per clustered system
Cores per controller/ control enclosure/ clustered system	10/20/80
Cache per controller/ control enclosure/ clustered system	32 or 64 GB/64 or 128 GB/up to 512 GB



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With their virtualized storage design and tight affinity with PowerVM, OpenStack, Microsoft ODX, VMware vSphere v6 and VMware vSphere Virtual Volumes (VVOL), Storwize V7000 Unified and Storwize V7000 are an ideal complement for virtualized servers that are at the heart of cloud deployments.

Storwize V7000 Unified and Storwize V7000 support both scaling up (by adding additional enclosures and drives) and scaling out (by clustering) for configuration growth. This flexibility simplifies planning for future requirements and enables organizations to purchase only as much storage and controller capability as needed. For additional investment protection, clusters can include both existing Storwize V7000 systems as well as new Storwize V7000 Unified and Storwize V7000 systems models.

Why IBM?

Innovative technology, open standards, excellent performance, and a broad portfolio of proven storage software, hardware and solutions offerings—all backed by IBM with its recognized industry leadership—are just a few of the reasons you should consider storage solutions from IBM, including Storwize V7000 Unified, Storwize V7000 and [Storwize V7000F](#).

For more information

To learn more about IBM Storwize V7000 Unified and Storwize V7000, please contact your IBM representative or IBM Business Partner, or visit: ibm.com/storage/storwizev7000

To learn more about IBM Storwize V7000F all-flash, please contact your IBM representative or IBM Business Partner, or visit: ibm.com/systems/storage/storwize/all-flash

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

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³ IBM lab measurements – April 2012

⁴ IBM lab measurements – April 2014

⁵ IBM lab measurements – August 2010

⁶ IBM lab measurements – September 2013



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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.

¹ Forrester Consulting, “Total Economic Impact Study of IBM Storwize V7000 – April 2012.” The paper is available from our website, including at ibm.com/systems/storage/disk/storwize_v7000/resources.html

² “Software Defined Infrastructure (SDI) Customer Survey Results 2015,” IDC, September 2015.



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