



## IBM SAN Volume Controller

*Leverage software-defined storage capability for new and existing storage*

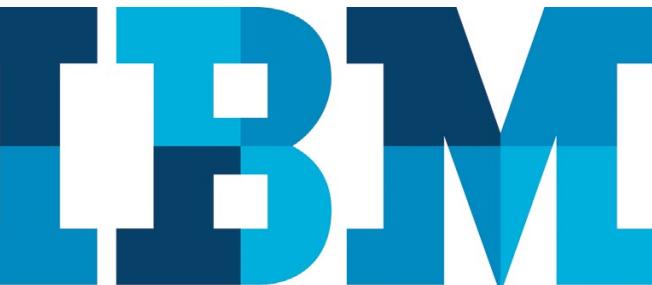
### Highlights

- Enhance storage functions, economics and flexibility
- Complement on-premises storage of all types with hybrid cloud capability
- Use encryption to help improve security for data on existing storage systems
- Leverage hardware-accelerated compression technologies for efficiency and performance
- Move data among storage systems without disruptions
- Optimize tiered storage—including flash storage—automatically with IBM® Easy Tier®
- Implement multi-site configurations for high availability and data mobility

Data is the new currency of business, the most critical asset of the modern organization. It's no surprise that this data is growing. In fact, Enterprise Strategy Group reports that costs, data growth, management and running out of space are among the top five storage challenges in 2017.<sup>1</sup>

As a result, the simple fact is that *infrastructure matters*. The right infrastructure allows organizations to shift spending and invest in projects that improve business results. The infrastructure must ensure the most value from data at the least cost with the least effort and the greatest flexibility. Organizations need:

- *Increased performance* to enable faster analytics and time to insights
- *Data reduction* that helps lower energy costs and frees up capital expense budgets
- *Reduced complexity* to drive down operational expenses and allow workers to focus on strategic priorities
- *High resiliency* to help meet service level agreements with confidence and secure data against threats



In the era of cloud, big data and analytics, and mobile and social computing, organizations need to meet ever-changing demands for storage while also improving data economics. IT must deliver more services faster and more efficiently, enable rapid insight and support more customer interaction. The right infrastructure allows clients to share information, secure transactions and drive *real-time* insights.

Building an effective infrastructure starts with software-defined storage, which frees data from physical storage and provides better access to applications. IBM Spectrum Storage™ software helps make an infrastructure simple, cost-effective, easy to manage and more responsive to changing business needs.

Built with IBM Spectrum Virtualize™ software—part of the IBM Spectrum Storage family—IBM SAN Volume Controller (SVC) helps organizations achieve better data economics by supporting these new workloads that are critical to their success. SVC systems can handle the massive volumes of data from mobile and social applications, enable rapid and flexible cloud services deployments and deliver the performance and scalability needed to gain insights from the latest analytics technologies.

An industry-leading storage solution, SVC has been delivering availability, reliability, flexibility and efficiency for more than 13 years. Its innovative capabilities, built with IBM Spectrum Virtualize, also provide the foundation for the IBM Storwize® family, IBM FlashSystem® V9000 and VersaStack integrated solutions.

### **Enhancing storage function**

SVC includes IBM Spectrum Virtualize technology to help insulate applications from physical storage. This enables applications to run without disruption, even when changes are made to the storage infrastructure.



SVC helps make new and existing storage more effective and includes many functions traditionally deployed separately in storage systems. SVC standardizes functions across storage systems for greater flexibility and lower costs.

IBM Spectrum Virtualize functions in SVC benefit all supported storage. For example, Easy Tier and compression help improve performance and increase effective capacity; encryption helps improve data security; and high-performance thin provisioning helps automate provisioning. These benefits can help extend the useful life of existing storage assets, helping to reduce costs. And since these functions are integrated into SVC, they can operate smoothly together, reducing management effort.

### **Hybrid cloud**

In a recent survey, more than 75 percent of companies said that to achieve their storage goals, they plan to increase spending on cloud services.<sup>2</sup> 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 SVC and the cloud enables use of cloud storage for disaster recovery from any of more than 400 supported storage systems, dramatically speeding the ability to deploy hybrid-cloud configurations while slashing the potential cost. IBM Spectrum Virtualize for Public Cloud enables new opportunities to migrate data between on-premises and public cloud storage as well as use of public cloud for disaster recovery. Together with IBM Spectrum™ Copy Data Management software, cloud storage may be used for data copies as well.

### **IBM Real-time Compression for enhanced efficiency**

IBM Real-time Compression™ is designed to enable organizations to store up to five times as much data in the same physical disk.<sup>3</sup> 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.

### **Improved application availability**

Moving data is one of the most common causes of planned downtime. IBM Spectrum Virtualize with SVC enables moving data from one storage system to another, or between arrays, while maintaining access to the data. This function can 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.

Should an SVC engine fail, a new “hot spare” capability enables the system to rapidly switch to a standby engine, restoring full redundancy and performance in seconds.

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 IBM 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.

IBM has shipped more than 150,000 systems running IBM Spectrum Virtualize, including more than 59,000 SVC engines. These dependable systems are delivering more than five nines of availability while managing more than 7.2 exabytes of data.<sup>4</sup>

### **Innovative flash storage support**

SVC supports up to twenty 12-Gbps SAS expansion enclosures per pair of SVC data engines, for up to 736 flash or disk drives. These enclosures provide low-cost storage capacity to complement external storage. SVC also supports IBM FlashSystem devices, other dedicated flash storage and flash drives within storage systems. The distributed RAID technology in SVC helps improve rebuild times and performance in drives within expansion enclosures by using all drives for data and spare capacity, rather than reserving some drives as spares.

## Tiered storage

Automated storage tiering with Easy Tier can help improve performance at a lower cost by enabling more efficient use of flash storage or multiple tiers of disk drives. Easy Tier automatically identifies more active data and moves that data to faster storage such as flash. This helps organizations use flash storage for the data that will benefit the most—helping deliver the maximum benefit, even from small amounts of flash storage capacity. In fact, Easy Tier can deliver up to three times performance improvement with only five percent flash storage capacity.<sup>5</sup>

Easy Tier can use any supported flash storage to benefit any other storage. This approach delivers greater benefits from flash storage than tiering systems that are limited to just a single disk system.

## Flexible replication

With many conventional disk systems, replication operations are limited to in-box or like-box-to-like-box circumstances. Functions from different vendors can operate in different ways, which makes operations in mixed environments more complex and increases the cost of changing storage types. But IBM Spectrum Virtualize software in SVC is designed to enable administrators to apply a single set of advanced, network-based replication services that operate in a consistent manner, regardless of the type of storage being used.

The IBM FlashCopy® function is designed to create an almost-instant copy (or “snapshot”) of active data that can be used for backup purposes or for parallel processing activities. Up to 256 copies of data may be created.

IBM Spectrum Protect™ Snapshot is designed to perform near-instant, application-aware snapshot backups using SVC FlashCopy local replication, but with minimal impact to IBM Db2®, Oracle, SAP, VMware, Microsoft SQL Server or Microsoft Exchange databases.

SVC also supports remote mirroring to enable organizations to create copies of data at remote locations for disaster recovery. Replication can occur between any systems built with IBM Spectrum Virtualize and can include any supported storage (including cloud with IBM Spectrum Virtualize software). Support for VMware vCenter Site Recovery Manager helps speed disaster recovery.

For IP replication, IBM Spectrum Virtualize uses innovative Bridgeworks WANrockIT technology to optimize use of network bandwidth and can compress data being transmitted to help reduce networking cost and improve remote replica currency.

## Simplified management

IBM Spectrum Virtualize software has a fresh new user interface for centralized management. With this single interface, administrators can 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 Microsoft System Center Operations Manager and VMware vCenter help enable more efficient, consolidated management in these environments. The new interface is common to other members of the IBM Spectrum Storage family, to simplify tasks for administrators and help reduce the risk of error.

SVC includes two new capabilities to improve serviceability. Both capabilities are optional and must be enabled by clients. A new automatic upload capability enables “one-click” creation and upload to IBM of service logs, eliminating the additional step of manually transmitting logs to IBM. In addition, clients using enterprise-class support can now elect to enable IBM service staff to use a secure connection to remotely access their SVC system and make recommended configuration changes. This approach is designed to eliminate the delay and potential for error when IBM support staff dictate required changes for clients.

## Complement server virtualization and containerization

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

Similar to virtualized servers, provisioning with SVC is achieved with software and with thin provisioning, and is designed to become an almost entirely automated function. Without SVC, 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, SVC enables any supported storage to be used as persistent storage in Docker and Kubernetes container environments, improving flexibility, simplifying deployment and helping to lower costs while offering clients the confidence of deploying stateful containers using highly available storage with enterprise capabilities.

Many organizations run mixed environments with a variety of virtualized and non-virtualized servers, and expect to do so for years to come. SVC offers an external storage virtualization function to provide consistent services for all attached servers, whether or not those servers are virtualized.

## Scalability and performance

SVC combines hardware and software into an integrated, modular solution that is highly scalable. The SVC data engine has two 8-core Intel E5-2667v4 3.2GHz processors with 64 to 256 GB of system memory in increments of 64 GB. Up to two compression accelerators based on Intel QuickAssist technology are available. Flexible host interface options support four built-in 10-Gbps Ethernet ports with options for up to sixteen 16-Gbps Fibre Channel ports, or up to twelve 16-Gbps Fibre Channel ports and four additional 10-Gbps Ethernet ports.

SVC data engines are always deployed in high-availability pairs, and up to four pairs may be clustered into a single system with up to 128 cores, 2 TB of system memory, 128 Fibre Channel ports, and up to 2,944 drives, which can support a total of 32 PB of storage capacity.

## Foundation for cloud deployments

Improving efficiency and delivering a flexible, responsive IT infrastructure are essential requirements for any cloud deployment. Technologies for delivering this infrastructure include virtualization, consolidation and automation.

With its robust storage capabilities, high-availability architecture and compatibility with PowerVM, Hyper-V, VMware, OpenStack, Kubernetes and Docker, SVC complements virtualized servers that are at the heart of cloud deployments.

## Why IBM?

IBM offers services to help speed implementation and improve return on investment. IBM storage specialists are available to conduct storage solution and infrastructure reviews that can help prepare and speed installation. And IBM Global Services can examine your infrastructure to help determine sizing and performance needs. In addition, you can choose from a range of service and subscription offerings designed to keep your infrastructure up-to-date and running smoothly.

### IBM SAN Volume Controller at a glance

Shared SMP processor configuration per engine	<ul style="list-style-type: none"> <li>Two Intel Xeon E5-2667v4 3.2GHz 8-core processors</li> </ul>
Processor memory per engine	<ul style="list-style-type: none"> <li>64 to 256 GB (in increments of 64 GB)</li> </ul>
Host adapter interfaces per engine	<ul style="list-style-type: none"> <li>Up to sixteen 16-Gbps Fibre Channel ports</li> <li>Up to four 10-Gbps optical (SFP+) Ethernet ports for iSCSI/Fibre Channel over Ethernet (FCoE)/replication</li> <li>Four 10-Gbps copper (RJ45) Ethernet ports for management and/or iSCSI</li> </ul>
Integrated drive support	Up to twenty 12-Gb SAS expansion enclosures; up to 736 drives (flash, SAS and nearline-SAS options) per pair of SVC data engines; up to 2,944 drives per clustered system
Maximum storage capacity	<ul style="list-style-type: none"> <li>Up to 32 PB usable capacity</li> </ul>
Internal drive size	<ul style="list-style-type: none"> <li>Flash drives: 200 GB, 400 GB, 800 GB, 1.6 TB, 1.92 TB, 3.2 TB, 3.84 TB, 7.68 TB, 15.36 TB</li> <li>SFF HDD: 300 GB, 600 GB, 900 GB 15K SAS; 900 GB, 1.2 TB, 1.8 TB, 2.4 TB 10K SAS; 2 TB 7.2K nearline-SAS</li> <li>LFF HDD: 4 TB, 6 TB, 8 TB, 10 TB 7.2K nearline-SAS</li> </ul>
RAID levels for internal drives	<ul style="list-style-type: none"> <li>0, 1, 5, 6 and 10, distributed</li> </ul>
Storage and server attachment	<ul style="list-style-type: none"> <li>Fibre Channel, FCoE and iSCSI</li> </ul>
Storage system support	<ul style="list-style-type: none"> <li>More than 400 flash, hybrid and disk storage systems</li> </ul>

## For more information

To learn more about IBM SAN Volume Controller, please contact your IBM representative or IBM Business Partner, or visit: [ibm.com/us-en/marketplace/san-volume-controller](http://ibm.com/us-en/marketplace/san-volume-controller)

For the complete and latest support information, visit:  
[ibm.com/storage/support/2145](http://ibm.com/storage/support/2145)

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](http://ibm.com/financing)



---

© Copyright IBM Corporation 2017

IBM Systems  
New Orchard Road  
Armonk, New York 10504

Produced in the United States of America  
October 2017

IBM, the IBM logo, ibm.com, Storwize, IBM FlashSystem, PowerVM, Db2, Easy Tier, FlashCopy, HyperSwap, IBM Spectrum Storage, IBM Spectrum Virtualize, IBM Spectrum Protect, and Real-time Compression are trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the web at "Copyright and trademark information" at [ibm.com/legal/copytrade.shtml](http://ibm.com/legal/copytrade.shtml)

Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

Microsoft is a trademark of Microsoft Corporation in the United States, other countries, or both.

VMware, the VMware logo, and VMware vSphere are registered trademarks or trademarks of VMware, Inc. or its subsidiaries in the United States and/or other jurisdictions.

This document is current as of the initial date of publication and may be changed by IBM at any time. Not all offerings are available in every country in which IBM operates.

The performance data discussed herein is presented as derived under specific operating conditions. Actual results may vary.

THE INFORMATION IN THIS DOCUMENT IS PROVIDED "AS IS" WITHOUT ANY WARRANTY, EXPRESS OR IMPLIED, INCLUDING WITHOUT ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND ANY WARRANTY OR CONDITION OF NON-INFRINGEMENT. IBM products are warranted according to the terms and conditions of the agreements under which they are provided.

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



Please Recycle

<sup>1</sup> Mark Peters, "ESG Brief: 2017 Storage Trends: Challenges and Spending," August 2017. <http://www.esg-global.com/research/esg-brief-2017-storage-trends-challenges-and-spending>

<sup>2</sup> "Voice of the Enterprise: Storage," 451 Research, 2016.  
<https://451research.com/customer-insight-voice-of-the-enterprise-overview>.

<sup>3</sup> IBM lab measurements – August 2017.

<sup>4</sup> Based on IBM internal measurements – April 2017.

<sup>5</sup> IBM lab measurements – August 2010.