IBM.

IBM SAN Volume Controller

Simplify and enhance your infrastructure with software-defined storage

Highlights

- Simplify storage with consistent capability and management
- Complement on-premises storage of all types with hybrid multicloud
- Use encryption to help improve data security
- Apply data reduction for efficiency and lower cost
- Move data among storage systems without disruptions
- Implement multi-site configurations for high availability and data mobility
- Optimize tiered storage effortlessly with IBM Easy Tier

Although most users (71%) regard storage as a strategic asset that is critical to their core business, multi-vendor storage deployments introduce complexity into the data center.

As a result, storage cost, management and optimization of data placement, and data migration are among the top five concerns of storage users.[1]

These concerns delay deployment of new storage technologies, limit flexibility, and increase costs.

The right software-defined storage is the answer. IBM SAN Volume Controller, built with IBM Spectrum Virtualize software, simplifies infrastructure and eliminates differences in management, function, and even hybrid multicloud support.

SVC introduces a common approach to storage management, function, replication, and hybrid multicloud that is independent of storage type. It's the key to modernizing and revitalizing your storage, but is as easy to understand as A, B, C ...

Agility: Move data without disruption among storage systems

- Use different storage systems for different tiers of storage

- Manage all your storage in a consistent way with common tools

Bridging: Bridge to new storage technologies or application areas such as containers

- Ease adoption of new technology so you get benefit quickly

- Easily add new storage systems and migrate data without disruption

- Support containers and Red Hat OpenShift with the storage you already have

Cloud: Add hybrid cloud capability to your storage

- Deploy a unified cloud capability across all storage types and different clouds

- Enjoy hybrid multicloud that is simple, consistent, and comprehensive

Data Reduction: Store more data on the storage you already own

- Support growing volumes of data

- Avoid or delay new purchases, reducing capex needs

Encryption: Improve cyber resiliency by encrypting data at rest

- Apply consistent encryption and key management across storage systems

- Make cyber resiliency simpler and more dependable

In the era of hybrid multicloud, 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.

Building an effective infrastructure starts with software-defined storage, which frees data from physical storage and provides better access to applications.

Built with IBM Spectrum Virtualize software—the software at the heart of IBM FlashSystem 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 15 years. Its innovative capabilities, built with IBM Spectrum Virtualize, also provide the foundation for the IBM FlashSystem and Storwize families, and VersaStack integrated solutions. IBM has shipped more than 180,000 systems running IBM Spectrum Virtualize. These dependable systems are delivering more than five nines of availability while managing more than 11 exabytes of data.[2]

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.

IBM SAN Volume Controller Engines

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, more than 500 systems from IBM and others. 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 multicloud

The IBM Institute for Business Value (IBV) surveyed over 1,000 executives in 19 industries headquartered in 20 countries to help quantify the rapid industry shift toward hybrid multicloud. They found 85 percent of companies were already operating some workloads in a multicloud environment in 2018 and that by 2021, that model of computing would be practically

ubiquitous.[3]

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 or the complexity of different cloud solutions from different storage vendors. IBM Spectrum Virtualize in SVC and the cloud enables a common cloud solution for all supported storage regardless of vendor. IBM Spectrum Virtualize for Public Cloud enables new use cases including cloud DR, DevOps and analytics, cyber resiliency, and workload migration.

Data reduction for enhanced efficiency

SVC can apply data reduction to new or existing storage to significantly increase usable capacity while maintaining application performance. This can help eliminate or drastically reduce costs for storage acquisition, rack space, power, and cooling, and can extend the useful life of existing storage assets. SVC data reduction includes compression, deduplication, thin provisioning, and SCSI unmap.

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.

Tiered storage

Automated storage tiering with Easy Tier can help improve performance at a lower cost by enabling more efficient use of flash storage, storage-class memory (SCM) or multiple tiers of disk drives. Easy Tier automatically identifies more active data and moves that data to flash.

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

Flexible replication

With many conventional storage 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.

IBM Spectrum Protect Snapshot is designed to perform near-instant, application-aware snapshot backups using SVC IBM 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 for Public Cloud software). Support for VMware vCenter Site Recovery Manager helps speed disaster recovery.

Simplified management

IBM Spectrum Virtualize software delivers a modern 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, VMware vCenter, and Red Hat Ansible help enable more efficient, consolidated management in these environments. The interface is consistent with other members of the IBM Spectrum Storage family, to simplify tasks for administrators and help reduce the risk of error.

Gain storage visibility, insight and control

As the resource on which your business depends, data is paramount. Your storage systems take on even greater importance. IBM Storage Insights and IBM Storage Insights Pro provide critical capabilities that enhance your experience throughout that data's lifetime:

- 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

- 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, Storage Insights is quick and easy to set up and requires no ongoing software maintenance. IBM Storage Insights Pro is an upgrade that

provides more detailed information and additional capabilities including support for cloud storage managed by IBM Spectrum Virtualize for Public Cloud.

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 CRI-O.

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.

Containerization is a key enabling technology for flexibly delivering workloads to private and public cloud and DevOps. SVC enables any supported storage to be used as persistent storage in container environments with support for the Container Storage Interface (CSI), 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 solution to provide consistent services for all attached servers, whether or not those servers are virtualized.

Scalability and performance

SVC is an integrated, modular highly scalable system. SVC engines are deployed in pairs for high availability; a system contains one to four pairs. SVC systems can be upgraded without disruption with more engines for greater performance. Two engine models are available to suit differing price/performance needs. Available networking options include 32 Gbps fibre channel, 10 Gbps ethernet, and 25 Gbps ethernet. SVC supports iSCSI, fibre channel, FC-NVMe, iWARP, and RoCE protocols.

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 CRI-O, SVC complements virtualized and containerized servers that are at the heart of cloud deployments.

[1] "ESG Master Survey Results: 2019 Data Storage Trends," November 2019. https://www.esg-global.com/research/esg-master-survey-results-2019-data-storage-trends

[2] Based on IBM internal measurements – October 2019.

[3] *IBM Institute for Business Value,* "Assembling your cloud orchestra – A field guide to multicloud management", 2018.

IBM SAN Volume Controller at a glance

Shared SMP processor configuration per engine	Model SA2: Dual 8-core 2.1GHz Intel Xeon 4208 (Cascade Lake) processors with 128-768GiB memory Model SV2: Dual 16-core 2.3GHz Intel Xeon 5218 (Cascade Lake) processors with 128-768GiB memory
Processor memory per engine	128 to 768 GiB
Host adapter interfaces per engine	• Up to twelve 32-Gbps Fibre Channel ports (FC or FC-NVMe) • Up to six 25-Gbps optical (SFP+) Ethernet ports for (iSCSI, iWARP, RoCE) • Four 10-Gbps copper (RJ45) Ethernet ports
Maximum storage capacity	Up to 32 PB usable capacity
Storage and server attachment	Fibre Channel, FC-NVMe, and iSCSI
Storage system support	More than 500 flash, hybrid and disk storage systems from IBM and other vendors

IBM

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.

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

For the complete and latest support information, visit: **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