IBM Storwize V7000: For your VMware virtual infrastructure

Innovative midrange disk system leverages integrated storage technologies

Highlights

- Complement server virtualization, extending cost savings and efficiency to storage devices

- Capitalize on enterprise-class technologies including built-in storage virtualization, thin provisioning and automated tiering

- Simplify management and improve administrator productivity with an intuitive, easy-to-use interface

- Nondisruptively migrate and mirror data for disaster recovery

With business information exponentially growing and IT budgets for managing that growth often flat or reduced, the power and efficiencies of virtualization provide an attractive and, in many cases, necessary option. A common strategy begins by virtualizing servers, often in a VMware-based environment. Your organization may already have implemented, or you may be considering, such a solution. But another valuable strategy is to build on your virtual server environment by virtualizing storage—extending the benefits of virtualization deeper and wider into infrastructure and operations.

The IBM Storwize® V7000 provides an easy, fast, efficient and cost-effective virtualized storage platform. When deployed with virtualization software solutions from VMware, it delivers the optimized, flexible infrastructure that mid-sized and enterprise-level organizations need in order to leverage business information, reduce the risk of system failure and gain greater system control.

This powerful disk system can help you get more from your VMware deployment because it can deliver cost and operational efficiency today as it positions your organization to meet the new business and technology demands of the future.

Storwize V7000 extends the benefits of virtualization to storage

Server and storage virtualization can help tame the complexity of operating and managing multivendor configurations. Virtualization can help improve utilization, simplify and speed provisioning, streamline application and data migration, and deliver greater flexibility in disaster recovery. It can increase IT staff efficiency, freeing personnel from low-value, routine tasks to focus on more high-value, strategic activities.

The Storwize V7000 makes your virtualization strategy still more valuable with advanced, built-in technologies such as thin provisioning and automated data tiering. Its ground-breaking graphical user interface (GUI) significantly reduces the effort required for both setup and administration.

The Storwize V7000 supports both its internal disk capacity and the ability to integrate your existing devices through virtualization—to deliver the capacity you need and help extend the life of your existing technology. The Storwize V7000 can manage non-IBM storage systems from a wide variety of vendors, enabling you to maximize the potential of your storage infrastructure.

The IBM Storwize V7000 is an integrated solution that can extend the benefits of virtualization to the storage environment.

An integrated platform optimizes resources and functions

Whether you have an existing VMware-based environment or you are now considering a move to virtualization, the Storwize V7000 can give you a centralized, integrated plat-form for optimizing and managing virtualized storage resources that complement your virtualized servers. The Storwize V7000 ushers in a new era in midrange disk systems that can extend storage virtualization's strengths, including:

- **Efficiency:** The combination of VMware with the Storwize V7000 can improve the overall efficiency of your infrastructure and your administration staff. It can effec-tively lower your cost of ownership by increasing disk uti-lization, eliminating performance bottlenecks, improving application service levels and speeding time-to-value.
- **Scalability:** The highly scalable Storwize V7000 is designed to allow you to start your virtualized storage environment small and grow it with your business. It can deliver up to 240 TB of physical storage capacity in the system itself, allowing you to streamline storage allocation to virtual machines and dynamically scale performance as well as capacity.
- **Manageability:** The innovative, intuitive and simple GUI built into the Storwize V7000 is designed to reduce admin-istrative complexity and boost IT productivity by enabling management of all storage devices through a single console.
- **Flexibility:** A Storwize V7000 and VMware deployment takes the flexibility inherent in storage virtualization to an even higher level with support for a range of disk technolo-gies including solid-state drives (SSDs) in the same environ-ment as standard hard disk drives (HDDs).

Key technologies create a storage virtualization leader

Efficiency, scalability, manageability and flexibility are core benefits of virtualized storage. To achieve them, the Storwize V7000 combines hardware and software to provide industry-leading capabilities.

Built-in support for virtualization

The Storwize V7000 is built using the same technology as IBM System Storage® SAN Volume Controller (SVC), an industry leader in storage virtualization. The Storwize V7000 supports all the sophisticated storage virtualization capabilities of SVC. In the Storwize V7000 system, all storage (both internal and external) is virtualized, helping deliver greater flexibility in provisioning, improved storage utilization, and the ability to move data from one type of storage to another as needed without disruption to applications.

When the Storwize V7000 virtualizes external storage systems, their capacity becomes part of the system, and it is managed with the same user interface. Virtualized capacity inherits all the rich functionality of the Storwize V7000, helping improve performance and utilization of existing storage assets, as well as helping improve administrator productivity. These capabilities can protect and increase the value of existing storage investments.

When virtualizing external storage, all stored information remains in place. When data movement is necessary, the Storwize V7000 supports nondisruptive movement of data between external storage and internal storage, which can reduce the time required to migrate data from weeks or even months to just days. Storwize V7000 capabilities integrate seamlessly with VMware vMotion's support for application mobility between physical servers—including servers from multiple vendors.

Automated data tiering

Data tiering capabilities of the Storwize V7000 can help your organization balance the cost of storage with the value of data. IBM System Storage Easy Tier technology—also built into the Storwize V7000—automatically moves heavily used data extents onto high-performance SSDs based on ongoing performance monitoring. The result: application performance can improve by as much as 200 percent.[1]

Tiering enables users to enjoy the performance benefits of SSDs without the excessive costs associated with placing too much of the wrong data on these relatively expensive drives.

Tiering enables less frequently accessed data to be located on less expensive HDD drives or on other systems, improving performance, reducing costs and simplifying management.

The Storwize V7000 enables streamlined allocation of storage to virtual machines. Advanced functions such as dynamic volume expansion make it easy to respond to changing requirements. And support for virtualization in external storage devices provides protection for existing investments as well as the ability to centralize management of heterogeneous equipment.

Thin provisioning

With the Storwize V7000, you can reduce the amount of idle storage capacity in your storage network—because users on your network will consume only the disk space they actually are using. For example, if you expect that a future user population will require 5 TB but current users need only 1 TB, you can virtually provision storage to meet future needs and yet consume only the amount of storage required now. This approach results in more efficient use of storage capacity as well as improved administrator productivity because the virtual configuration does not need to change as users grow their usage.

Allocating disk storage among multiple users based on the minimum space each requires at any given time gives you the ability to meet increased capacity, utilization and performance requirements. And with thin provisioning capabilities for managing high-performance data, you don't have to choose between performance and efficiency.

Combining additional built-in capabilities such as snapshot technology, the Storwize V7000 supports the right-sizing of your disk storage systems to eliminate over-provisioning. In backup and restore operations, for example, the system can utilize IBM FlashCopy® software to make near-instant copies of data, and then utilize the Space-Efficient FlashCopy function to reduce the need for provisioned storage by as much as 75 percent.[2]
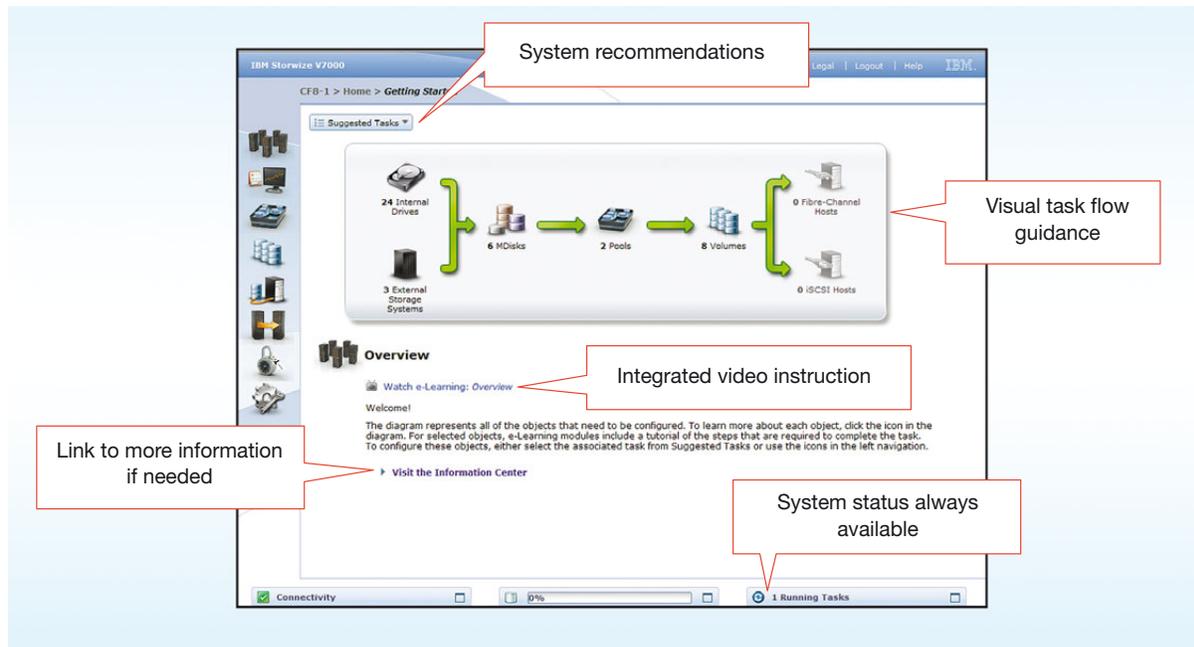
The GUI's "Getting Started" page for first-time users automatically detects the number of objects on the system and intelligently guides the user with suggested tasks based on the configuration.

An innovative GUI simplifies storage administration

The Storwize V7000 makes these and other storage virtualization functions more accessible than ever through its intuitive, easy-to-use GUI. By providing centralized management, hiding the complexity of advanced functions, simplifying operations with a point-and-click functionality and allowing web-based access for anywhere, anytime management, the GUI streamlines virtual storage administration for internal and external disks across the environment.

Designed for easy setup and installation, the GUI facilitates technology upgrades and data migration. Advanced software enabling built-in capabilities for tiering, copying and thin provisioning as well as premium features for external virtualization and remote mirroring are preinstalled.

Integrating easily with other IBM and third-party disk systems, the interface provides consistent management across the virtualized environment—eliminating the need for administrators to learn and use multiple management and monitoring paradigms.

Integrated capabilities help keep vital business data safe

In addition to its overall support for virtualized environments and its capabilities for data tiering and thin provisioning, the Storwize V7000 is designed to make full use of virtualization's ability to protect data with high availability and enhanced disaster recovery.

The ability of the Storwize V7000 to streamline and enhance availability and recovery is further supported by strategies built on VMware Site Recovery Manager, FlashCopy, volume mirroring, remote mirroring, and IBM Tivoli® Storage Manager FastBack™ software.

- **VMware Site Recovery Manager:** The Storwize V7000 provides seamless integration with this solution to enable planning, testing and executing of a scheduled migration or emergency failover from one site to another.
- **IBM FlashCopy:** Fully integrated as a standard feature of the Storwize V7000, FlashCopy provides a near-instant "point-in-time" copy of a source volume's contents to a target volume.
- **Volume mirroring:** This Storwize V7000 function complements VMware vMotion and VMware High Availability by storing copies of data on different storage systems and using whichever copy remains available in the event of a failure.
- **Remote mirroring:** An optional feature of the Storwize V7000, this function provides metro mirror or global mirror capabilities to protect data by creating copies of volumes in a separate storage array. Both functions support VMware vCenter Site Recovery Manager.
- **Tivoli Storage Manager FastBack:** When coupled with the Storwize V7000, this advanced data protection solution provides near-instant recovery for Microsoft® Windows® or Linux® data from any point in time.

The Storwize V7000 supports data protection capabilities of both VMware High Availability (HA) and VMware Site Recovery Manager (SRM) software. VMware HA provides failover for virtual machines using a pool of server resources. VMware SRM integrates tightly with VMware Infrastructure, VMware VirtualCenter and storage replication software from IBM, enabling site failovers to recover rapidly, reliably and economically.

IBM storage virtualization leverages a global partnership

IBM is committed to VMware—one of our global alliance partners—and to working together with VMware to deliver continuous improvement and seamless application integration, optimizing business results and minimizing time-to-value for our customers.

The Storwize V7000 seamlessly integrates with the IBM systems and storage management portfolio of solutions for additional storage efficiency benefits. Solutions include IBM Tivoli Storage Productivity Center, IBM Tivoli Storage FlashCopy Manager, IBM Tivoli Storage Manager, IBM Tivoli Storage Manager FastBack, IBM Systems Director and IBM Systems Director Storage Control.

For more information

To learn more about the IBM Storwize V7000 and how it can enhance a VMware-based virtualized storage environment, contact your IBM sales representative or IBM Business Partner, or visit: **ibm.com**/storage/storwizev7000

[1] Storage Performance Council, SPC Benchmark 1™ Full Disclosure Report: IBM Corporation, IBM System Storage DS8700 Release 6.1 (Easy Tier and SSDs), April 13, 2010.
www.storageperformance.org/benchmark_results_files/ SPC-1/IBM/A00092_IBM_DS8700_EasyTier-SSDs/ a00092_IBM_DS8700_EasyTier-SSDs_SPC1_full-disclosure.pdf

[2] According to IBM estimates.