# Veritas Storage Foundation™ 4.3 *for Windows*® by Symantec

## Advanced online volume management technology for Windows

Veritas Storage Foundation *for Windows* brings advanced volume management technology to Windows Server™ 2003 and Windows 2000 environments. By creating virtual storage devices from physical disks and disk arrays, you can optimally configure, share, and manage storage. Traditional disk storage management is a labor-intensive process, often requiring servers and mission-critical applications such as Microsoft® Exchange and SQL Server to be taken offline for hours at a time—disabling user access to data and requiring tedious, manual intervention by system administrators. Storage Foundation *for Windows* provides easy-to-use, online storage management for growing enterprise computing and Fibre Channel or iSCSI-based storage area network (SAN) environments.

In 2000, Microsoft selected Veritas Software, the leading enterprise-class storage-management software provider, to develop the disk management software for Windows 2000 and Windows Server 2003. Microsoft's built-in disk and volume management software, Logical Disk Manager (LDM), was jointly developed by Microsoft and Veritas. The fully featured Veritas Storage Foundation *for Windows* extends and enhances the capabilities of LDM. Data created in LDM is easily migrated to Veritas Storage Foundation *for Windows*. The Storage Foundation enterprise-class storage management capabilities offer you the most flexibility to create and manage storage configurations that grow and adapt with your business needs.

### Highlights

- **Online configuration with dynamic disks**—Optimize storage performance and availability without bringing operating systems or applications offline
- **GUI-based management and online performance**—Proactively identify storage bottlenecks and non-disruptively migrate data to other storage devices by a simple drag-and-drop
- **Quick recovery and off-host backup**—Enable administrators to create consistent online and fault-tolerant point-in-time copies for data recovery and/or off-host backups, with minimal impact to applications
- **Multi I/O path availability and performance**—Provide fault-tolerant path failover capability and efficient workload balancing across all available paths
- **Heterogeneous storage and OS support**—Storage Foundation is cross-platform-enabled and does not lock you into any particular OS or hardware array platform
- **Centralized storage management**—Achieve faster deployment and reduce application downtime risk as applications are migrated to new hardware in homogeneous or heterogeneous environments
- **High availability for mission-critical Windows applications**—Deliver a single clustering solution from local LAN and metropolitan area network (MAN), to a wide area solution across IP subnets

- **Business continuity and data replication over any distance**—Replicate data over any distance without performance impact to critical applications while maintaining the highest levels of data currency

**Note:** Please refer to the Veritas Storage Foundation HA *for Windows* and the Veritas Volume Replicator data sheets for additional details.

## Online configuration with dynamic disks

Starting with Windows 2000, dynamic storage is the method for managing disks and the space they contain. A disk initialized for dynamic storage is called a dynamic disk. It can hold simple volumes, spanned volumes, mirrored volumes, striped volumes, and RAID 5 volumes. With the dynamic storage capability of Storage Foundation *for Windows,* it is possible to perform disk and volume management without having to restart the operating system, thereby significantly improving online application performance. In addition to the advantage of being more reliable and allowing online management, dynamic disk configurations survive loss of the operating system. Connecting them to another host in the event of a disaster will allow Windows to access them and the data they contain. Basic disks, on the other hand, store their configuration information in the Windows registry. In the event of a loss of the operating system, recovery must be accomplished from tape backup, which is often error-prone and time-consuming.

## GUI-based management and online performance

The Veritas Storage Foundation for Windows GUI enables centralized, online cross-platform storage management. It simplifies disk administration tasks, such as adding or moving storage resources or data. Storage Foundation *for Windows* configures and monitors leading hardware RAID arrays, manages SAN-based storage, and supports clustering configurations with Veritas Cluster Server (VCS) and Microsoft Cluster Server (MSCS). Storage Foundation *for Windows* also integrates with Microsoft Operations Manager (MOM).

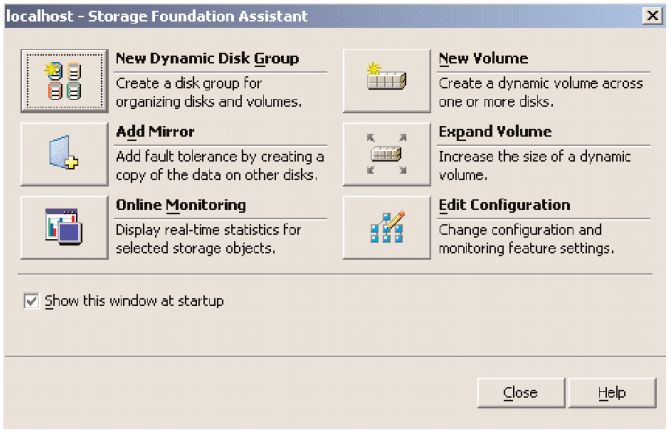


**Figure 1. The Storage Foundation assistant provides ready access to most commonly used commands.**

Storage Foundation *for Windows* can be used to protect mission-critical applications by mirroring and managing data across different disk devices and subsystems, including RAID devices, without taking applications offline. The advanced storage management tools found in Storage Foundation include online storage configuration, online logical volume management, and flexible I/O performance monitoring. Storage Foundation *for Windows* enables dynamic disk movement via drag-and-drop to facilitate storage consolidation, DAS to SAN migration, performance optimization, and storage array migrations. Multiple dynamic disk groups facilitate easy storage migration from server to server, and private disk group protection helps ensure against unauthorized access of a shared resource during SAN reboot.

Online storage bottlenecks and I/O hotspots can be proactively detected and data migrated non-disruptively using a drag-and-drop interface. The VxCache functionality allocates dedicated cache to volumes, and improves Exchange performance by 40% (depending on work loads).

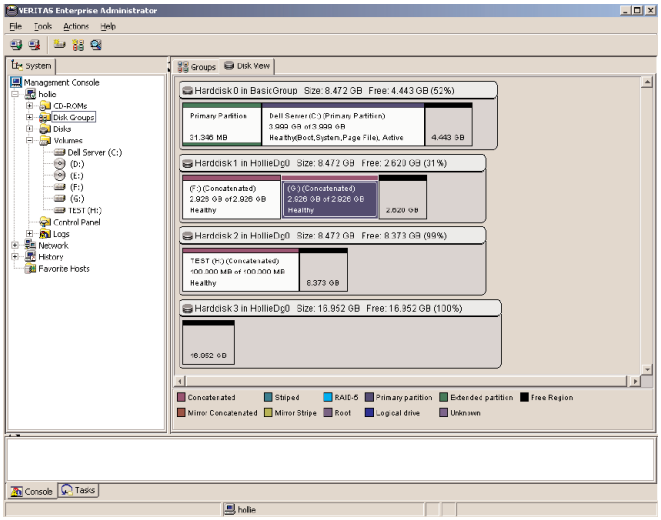


**Figure 2. With a simple drag-and-drop interface, move disk to consolidate storage, migrate from DAS to SAN, update arrays, and/or retire arrays—all online without taking systems or users offline.**

## Quick recovery and off-host backup

Storage Foundation FlashSnap,™ a Veritas Storage Foundation *for Windows* option, enables administrators to create online, consistent, fault-tolerant, point-in-time copies with minimal impact to applications and users. Copies can be used as a first line of defense for quick recovery or for off-host backups. FlashSnap is fully integrated with the Windows Server 2003 Volume Shadow Copy Service (VSS) framework as a VSS Provider. VSS (VDI for SQL) framework integration ensures that "stateful" applications such as Microsoft Exchange are quiesced before making copies of the data. The Exchange VSS snapshot quick recovery process makes it possible to fully restore Exchange to a point in time or to "roll forward" to the point immediately before a failure.

FlashSnap supports the broadest choice of leading heterogeneous storage arrays and is compatible with the growing list of leading backup applications. Storage array flexibility makes it possible to tier data and offload copies from expensive storage to lower-cost arrays. Automating this process simplifies the operation, reduces human error, and provides protection for mission-critical data. Finally, unlike copy-on-write (COW) technology, FlashSnap is fault-tolerant and not dependent on loss of original volume.

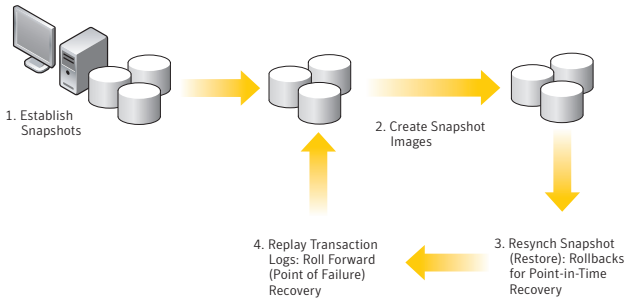


**Figure 3. Establishing snapshots and using rollbacks or roll-forward to recover from data corruption or logical failures**

## Multi I/O path availability and performance

The Storage Foundation Dynamic Multi-pathing (DMP) software option provides heterogeneous front-end intelligence to manage multiple I/O paths between a server and the logical unit number (LUN) and disks in a storage subsystem, thereby eliminating single points of failure. If connectivity along one path to a storage device is interrupted—for example, due to a host bus adapter (HBA) or switch failure—DMP dynamically switches I/Os to a surviving path, allowing application access to continue unimpeded. Advanced

multi-pathing management allows GUI visualization of array resources, command line interfaces for custom scripts, path performance statistics, proactive path checking, and SNMP alerts for path failure notification and recovery. Using multiple paths and a variety of load-balancing algorithms, DMP increases the available bandwidth for, say, business-critical SQL database records. Additionally, multi-host DMP management for firmware upgrades and path management can be centrally managed with the Storage Foundation Management Server (SFMS) feature, which enhances administrator productivity. DMP is Microsoft WHQL Logo Qualified and also completely compliant with the Microsoft Multipath I/O (MPIO) framework, ensuring the required robust interoperability in a Windows environment.

## Heterogeneous storage and OS support

Veritas Storage Foundation ships with the Veritas Enterprise Administrator (VEA) graphical user interface. This enables cross-platform volume management across multiple operating systems including support for most leading storage arrays across iSCSI and fibre channel technologies. Storage Foundation does not restrict use with only specific hardware and operating system combinations, thus providing greater flexibility with IT vendor choices. Storage Foundation *for Windows* shares the same management interface across operating systems, thereby minimizing the learning curve whether the environment is Linux, UNIX, or Windows, thus significantly lowering administrative costs and the potential for errors due to needless complexity.

## Centralized storage management

In today's rapid scale-out Windows and Linux server environments, reducing management complexity associated with hardware sprawl is paramount. With the SFMS feature, it is possible to choose industry-leading functionality across server platforms and centrally manage storage environments, whether managing tens or thousands of servers from multiple vendors. This leads to faster application deployment times and higher service levels, reduces the risk of human error, and provides comprehensive visibility throughout the environment.

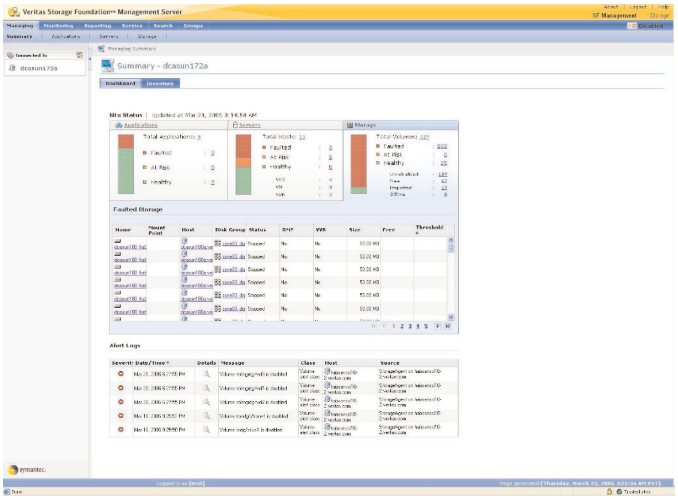


**Figure 4. The Management Server feature simplifies storage management and migrations.**

Administrators can quickly and easily create new storage environments to support a heterogeneous data center infrastructure. As applications are upgraded or migrated to new hardware, administrators can centrally manage heterogeneous host migrations or homogeneous host migrations, and do a premigration check to verify that the server and storage configurations are correctly set up before the migration begins. This reduces the chance of

application downtime and leads to faster deployment times. Application downtime traditionally caused by problems with Fibre Channel connections, firmware and drivers for host bus adaptors, and Fibre Channel switch ports can now be centrally managed easily with the SFMS feature.

### High application availability for mission-critical Windows applications

Veritas Storage Foundation HA *for Windows* by Symantec comprises Veritas Storage Foundation *for Windows* and Veritas Cluster Server by Symantec (VCS). VCS monitors the status of applications and automatically moves them to another server in the event of planned or unplanned outages. It can detect faults in an application and all its dependent components, including the associated database, operating system, network, and storage resources. VCS shuts down the application, restarts it on an available server, connects it to the appropriate storage device, and resumes normal operations.

VCS provides off-the-shelf support for a wide range of applications, including the ability to write custom application agents. Whether it is a mission-critical Exchange email infrastructure or a CRM and ERP application using a SQL database, Storage Foundation HA *for Windows* can achieve local, metropolitan, and wide area availability and disaster recovery with a single scalable solution. A Microsoft Cluster Server (MSCS) option adds dynamic disk capability to MSCS and eliminates significant availability vulnerabilities such as quorum disk failure with MSCS. It does not impose any majority node set requirements and associated additional hardware to keep services running.

### Business continuity and data replication over any distance

A good disaster recovery plan should include both data and application availability against all odds. Combined, Veritas Cluster Server and data replication provide a fully integrated solution for data center availability. In conjunction with the Veritas Volume Replicator Option by Symantec, Veritas Cluster Server can be configured to manage replication services so that when an application failure occurs, data replication is stopped at the primary site, replicated storage groups are imported at the DR site, and replication roles are reversed. Veritas Cluster Server is tightly integrated with Veritas Volume Replicator, the leading replication solution offered with Storage Foundation *for Windows*. In addition, Veritas Cluster Server can manage multiple array-based replication technologies, including EMC SRDF and SRDF/A, EMC MirrorView and MirrorView/A, Hitachi TrueCopy, IBM® PPRC, IBM MetroMirror, and Network Appliance SnapMirror.

**Note:** For additional information, please refer to the Veritas Volume Replicator Option and Veritas Storage Foundation HA *for Windows* data sheets.

## Supported OS platforms

- Microsoft Windows Server 2003
- Microsoft Windows 2000
- Microsoft Windows XP Professional and Windows 2000 Professional (Client only)

## Supported applications

Compatible with most leading Windows server applications, including:

- Microsoft Exchange Server 2003, 2000, and 5.5
- Microsoft SQL Server 2005, 2000, and 7.0
- Oracle® 8i,9i, 10g, and 11i
- Microsoft SharePoint® 2003
- Enterprise Vault™ 6.0, NetBackup™ 6.0, Microsoft File Server, Microsoft Print Server

**Note:** Veritas Cluster Server provides a utility to easily cluster any off-the-shelf or custom application using generic agents.

For additional information in support of Veritas Storage Foundation High Availability *for Windows* and the Volume Replicator Option, view the Veritas Cluster Server and Veritas Volume Replicator Option data sheets.

## Related products

- Veritas Volume Replicator
- Veritas Cluster Server
- Veritas Storage Foundation HA

## File systems supported

Veritas Storage Foundation *for Windows* supports all standard file systems, including:

- NTFS
- FAT and FAT32 file systems
- MBR and GPT Partition Support

## Storage devices

Veritas Storage Foundation *for Windows* supports a wide variety of storage devices:

- It supports any device in the Microsoft Windows Server Catalog.
- If multi-pathing or clustering functionality is being used, check with your Symantec representative for compatibility.

### *Minimum free disk space to install*

- 475 MB minimum; 675 MB of disk space is required for full installation if optional programs are included

### *Minimum system memory size*

- Minimum required: 256 MB
- Recommended: 512 MB

If Veritas Dynamic Multi-pathing MPIO or VxCache Options are installed:

- Minimum required: 512 MB
- Recommended: 1 GB

### *Minimum system processor speed*

- 300 MHz Pentium® II minimum processor speed
- 550 MHz Pentium III or faster

## More information

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http://enterprise.symantec.com

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