VERITAS Volume Manager™ v3.0 for Windows 2000

ADVANCED STORAGE MANAGEMENT TECHNOLOGY FOR THE WINDOWS 2000 PLATFORM

In distributed client/server environments, users demand that databases, mission-critical applications and other resources be continuously available and safe from disk failure damage. Traditional disk storage management is a labor-intensive process, often requiring that machines be taken offline for hours at a time — disabling user access to data and requiring tedious, manual intervention by system administrators. VERITAS Volume Manager™ for Windows 2000 brings advanced disk storagemanagement technology to Windows 2000. By creating virtual storage devices from physical disks and disk arrays, Volume Manager removes the physical limitations of disk storage so you can configure, share and manage storage for optimal results.
Volume Manager provides easy-to-use, online storage management for enterprise computing and Storage Area Network (SAN) environments.

Organizations are beginning to use the enormous potential of SANs to keep server applications available in today's ever-changing e-business-focused environment. VERITAS Volume Manager is ideal for maximizing SAN-based application uptime. Volume Manager has intrinsic features that allow organizations to increase application availability by virtualizing physical storage resources within a more complex, networked storage environment. Virtualizing and centralizing storage resources over a SAN reduces administrative overhead and provides a scalable foundation to manage the unpredictable growth of Internet-driven businesses.

Microsoft selected VERITAS Software, the leading enterprise-class storage-management software provider, to develop the disk management software for Windows 2000. Microsoft's built-in disk and volume management software, Disk Management, which is also called Logical Disk Manager or LDM, was jointly developed by Microsoft and VERITAS. The fully featured VERITAS Volume Manager for Windows 2000 extends and enhances the capabilities of Windows 2000 Disk Management. Data created in Disk Management is easily migrated to Volume Manager for Windows 2000. The Volume Manager enterprise-class storage-management capabilities offer you the most flexibility to create and manage storage configurations that grow and adapt with your business needs.

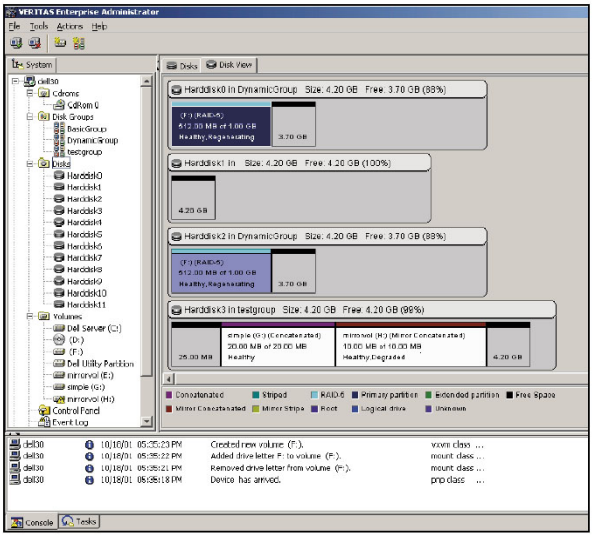
SIMPLIFIED, CENTRALIZED STORAGE MANAGEMENT

VERITAS Volume Manager™ enables online administration from a single management console across multiple hosts and operating systems. The easy-to-use interface simplifies disk administration tasks, such as adding or moving storage resources or data. Volume Manager configures and monitors leading hardware RAID arrays, manages SAN-based storage and supports clustering configurations with VERITAS Cluster Server™ and Microsoft Cluster Server (MSCS).

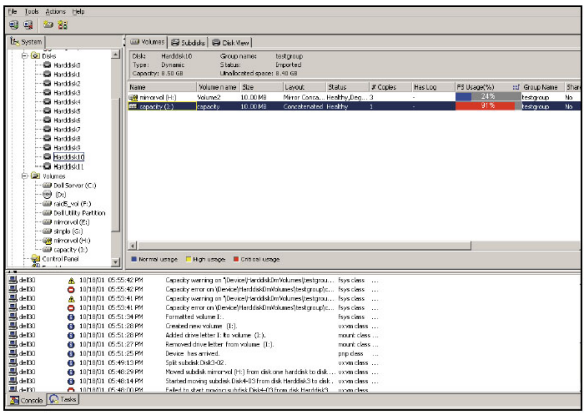
ENHANCED PERFORMANCE

Volume Manager lets you optimize storage performance based on your usage patterns. Volume Manager identifies storage bottlenecks and allows you to migrate data to other devices, even while applications and their data remain online and available. Use Volume Manager to balance I/O loads and to stripe data across multiple storage devices and subsystems for maximum throughput.

The VERITAS Enterprise Administrator GUI enables centralized, cross-platform storage management.



The VERITAS Enterprise Administrator GUI reduces the cost of storage administration by providing disk storage management from one central console.



The VERITAS Enterprise Administrator GUI allows you to see all volumes mounted from one location to quickly determine the volume, status and capacity.

KEEP DATA ONLINE AND AVAILABLE

You can use Volume Manager to protect critical applications by mirroring data across different disk devices and subsystems, including RAID devices. Volume Manager lets you perform basic administrative tasks while the data is online and available, so planned downtime is reduced. The advanced storage management tools found in Volume Manager include online storage configuration, online logical volume management and flexible I/O performance monitoring. These capabilities are critical for maintaining highly available, high-performance storage on a variety of hardware devices.

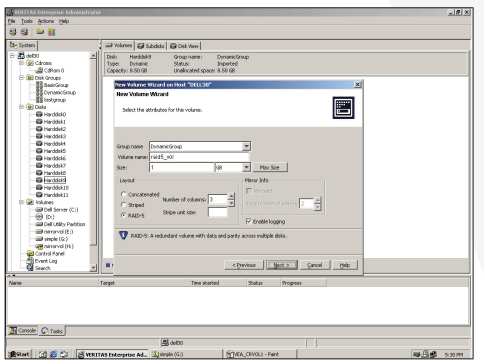
The VERITAS FlashSnap™ option also enhances administrators' ability to create online copies of real-time data with minimal impact to applications or users. With dynamic multipathing (DMP), availability is enhanced by providing a disk path failover mechanism and performance is improved by I/O load balancing.

HARDWARE AND SOFTWARE INVESTMENT PROTECTION

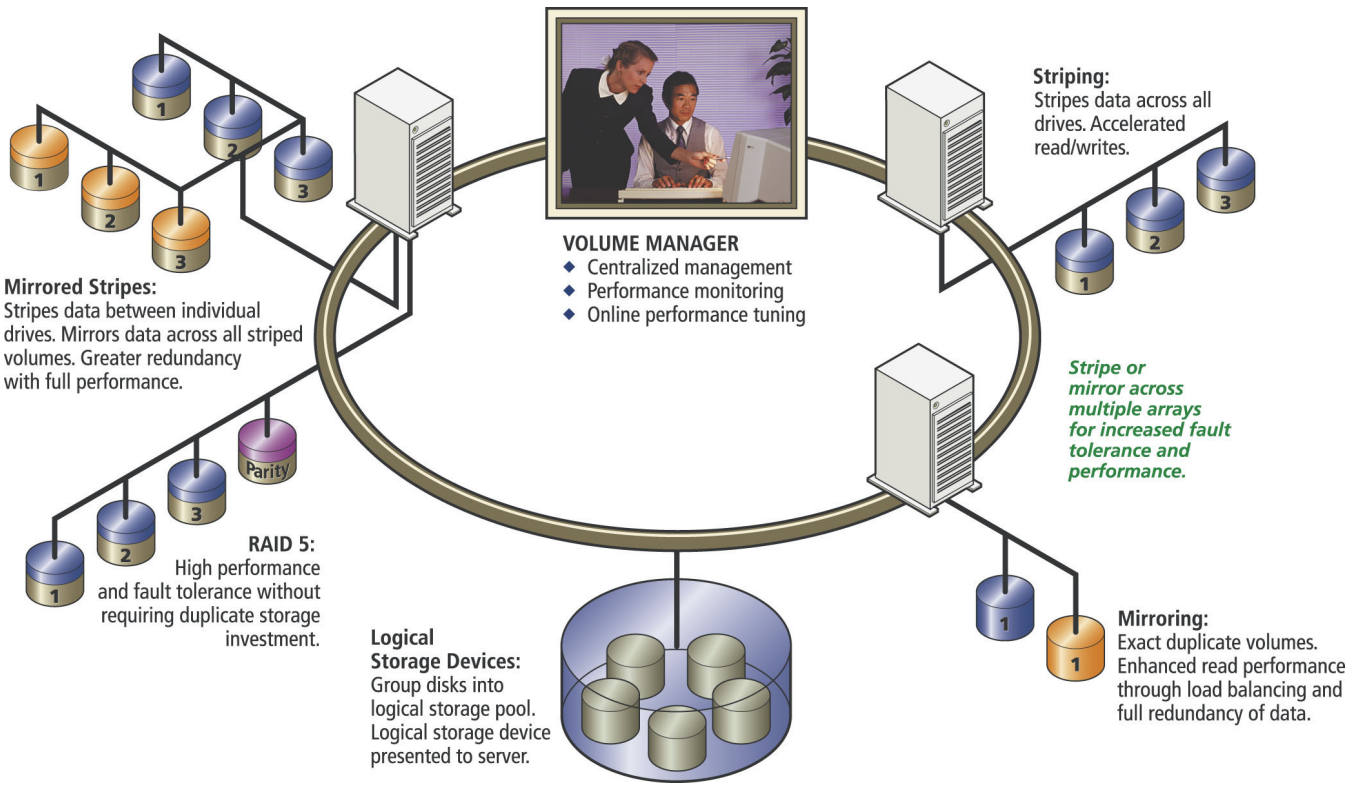
VERITAS Volume Manager ships with the VERITAS Enterprise Administrator (VEA) graphical user interface, which enables cross-platform volume management. Volume Manager is not tied to specific hardware and provides a consistent approach to heterogeneous storage hardware environments, thus allowing organizations to protect their current hardware investment and the freedom of choice for future purchases.

VERITAS FLASHSNAP™

VERITAS FlashSnap, an option of VERITAS Volume Manager, is a flexible, storage management solution that enables administrators to create point-in-time copies with minimal impact to applications and users. It also addresses issues such as shrinking maintenance and backup windows. The snapshots that FlashSnap creates can be accessed from the same server or easily be imported to another host. This allows users to perform resource-intensive processes such as backups, decision support and reporting. To greatly reduce the resynchronization time and performance impact on the server when the volume snapshot is reattached, FastResync technology synchronizes only the changes that occurred while the volume snapshots were split. FlashSnap works with a wide range of disk subsystems, delivering a powerful and flexible solution that frees you from hardware and application restrictions.



The Volume Manager Wizards provide easy, step-by-step instructions.



VERITAS®

VOLUME MANAGER™ FOR WINDOWS 2000

Features	Benefits
Powerful, Centralized Storage Management	
Online Flexible Administration of Data Volumes	
Centralized Storage Management for an Intuitive Graphical User Interface (GUI)	Displays logical view of storage devices and provides easy monitoring of disk configurations. Simplified configuration and management improve productivity and reduce the cost of storage administration
Command Line (CLI) Support	Choice of using the GUI or the command line Provides scripting capability to automate repetitive tasks
Easy Online Storage Growth, Reconfiguration and Administration	Zero downtime for storage growth and administration • Grow volumes dynamically with no downtime • Easily move volumes from array to array using drag-and-drop GUI • Reduce storage costs by combining the unused space on multiple arrays • Increase server availability and eliminate server downtime associated with storage growth
Proactive Monitoring and Notification	Proactive storage event notification improves performance and reduces downtime
• Capacity monitoring	• Provides a warning when any dynamic volume has nearly reached full capacity
• SNMP alerts	• Allows SNMP alerts to be sent to a centralized management console.
• E-mail/pager	• Sends storage administrators an e-mail or page in the event of a storagerelated problem
• Event log	• Logs all storage-related events to allow storage administrators the ability to review storage changes and events
Management of Free-Space Pool for Volume Growth	Simplified administration and flexible use of available hardware
High Availability	
Advanced, Integrated Volume Support	
Dynamic Online Growth for all Volumes	Reduced downtime for storage administration and growth without rebooting the server
Software RAID Capabilities for Simple, Spanned, Striped, Mirrored, Striped Mirrors and RAID 5 Volumes	Allow software RAID capabilities to be combined with hardware RAID to provide the optimum storage resource for your applications
Dynamic Multipathing Support for Unlimited Failover and Load Balancing	• Continuous data access eliminates single points of failure • Increases availability if one path becomes unavailable • Increases performance by spreading I/O between multiple paths • Operates in fibre channel arbitrated loop, switch fabric and SCSI environments • Supports leading storage arrays from a wide selection of array vendors
Hot Relocation, Hot Spare and Undo Hot Relocation	Proactive storage management when I/O errors occur on disks
Dirty Region Logging	Provides fast recovery after system failure
RAID 5 Logging	Ensures prompt recovery of a RAID 5 volume in the event of a power failure
Self-Monitoring Analysis and Reporting Technology (SMART)-enabled	Monitors disk resources for potential hardware failures to take proactive measures to prevent storage failures
Disk Replacement or Disk Evacuation	Allows the disk configuration to be easily moved to an alternate disk in the case of disk failure and disk retirement
Automatic Growth Based Upon Capacity	Proactively solves a storage-related problem based upon a predefined rule
Superior Clustering Support: • Allows use of dynamic disks with VERITAS Cluster Server (and Microsoft Cluster Server [MSCS]) • Storage migration for shared devices clustering • Mirrored MSCS quorum resources provide disaster recovery	 • Allows clustered Windows servers to utilize all of the benefits of dynamic disks • Failover of the disk groups configured with Volume Manager provides high levels of data integrity and availability • MSCS quorum resource failures can be prevented by mirroring the quorum resource in multiple locations

Features	Benefits
Performance and Scalability	
Optimized Data Management That Can Grow with the Business	
Aids the Allocation of Shared Disks in Storage Networks	Improves efficiency, which reduces preallocated, nonshared storage by allocating disks only when needed
Striping and Selective Disk Mirroring	Increases throughput and bandwidth while providing scalable performance and balancing of application data loads
Spanning Data Across Multiple Disks	Offers storage without physical limitations
Independence From Device Drivers, the File System and Databases	Supports existing systems that do not require new hardware or software, and integrates easily with disk subsystems and arrays, including hardware RAID systems
Online Performance Monitoring and Tuning Tools	Identifies and minimizes I/O bottlenecks
Preferred Mirror (read-only from target plex of mirror volume)	Improves read performance by assigning a local mirror disk for read operations
Striping Across Disk and RAID Devices	High performance from existing devices
Multiple Dynamic Disk Groups	Allow easy storage migration from server to server
Private Disk Group Protection	Protects Windows SAN-based storage resources from being imported into other servers
Heterogeneous Support	
Platform-Independent GUI	Simplifies operations for centralized cross-platform management, which reduces storage administration and training costs
Supports Multiple Heterogeneous Storage Hardware	Reduces training costs and administrative overhead and provides maximum flexibility by allowing businesses to select the storage hardware solutions that best meet their needs
Ability to Move Disk Groups Between Servers	Easier migration between servers with reduced downtime
Integration	
Data Snapshots (VERITAS FlashSnap™)	Provides mirrored data snapshots, which enable: • On-disk backup images for protecting mission-critical data • On-host and off-host backup of split mirrors and fast resynchronization of mirrors
High Integration With Other VERITAS Storage Management Solutions	Provides a foundation that enables a complete end-to-end storage management solution

SYSTEM REQUIREMENTS

SUPPORTED PLATFORMS

- Windows 2000 Server, Advanced Server and Datacenter Server (Server or Client)
- Windows 2000 Professional and Windows XP Professional (Client only) Service Pack 1 minimum requirement for Windows 2000 Professional, Server and Advanced Server

FILE SYSTEMS

VERITAS Volume Manager™ for Windows 2000 supports all standard file systems, including:

- Windows 2000 NTFS
- FAT and FAT32 file systems

STORAGE DEVICES

VERITAS Volume Manager for Windows 2000 supports a wide variety of storage devices

- If the dynamic multipathing (DMP) or clustering functionality is not being used, then Volume Manager for Windows 2000 supports any device on the Windows 2000 Hardware Compatibility List (HCL).
- If DMP or clustering functionality is being used, check with your VERITAS representative for compatibility.

MINIMUM FREE DISK SPACE TO INSTALL:

150 MB of disk space is required for the full installation if you include the optional programs

MINIMUM SYSTEM MEMORY SIZE:

128 MB suggested

MINIMUM SYSTEM PROCESSOR SPEED:

- No minimum required
- 200 MHz-plus Pentium suggested

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