Veritas Storage Foundation HA for Windows is a comprehensive solution that delivers data and application availability for Microsoft® Windows environments. Veritas Storage Foundation HA comprises two industry-leading availability technologies: Veritas Storage Foundation for Windows and Veritas Cluster Server (VCS). Veritas Storage Foundation for Windows provides online storage management tools to enable high availability of data and optimized I/O performance across multiple hardware platforms.

VCS monitors an application and all of its dependent components, including the associated database, operating system, network, and storage resources. When a failure is detected, VCS gracefully shuts down the application along with associated resources and restarts it on an available server.

According to IDC, Symantec is the number one provider of multi-platform clustering software. And 99% of the Fortune 500 rely on Symantec software for the data center to maintain the availability of their critical applications.

### Highlights

- **Availability across any distance**—Cluster applications across wide area distances and different IP subnets for disaster recovery.
- **No quorum disk**—VCS does not require a quorum disk, eliminating the single point of failure present in other HA solutions.
- **Centralized management**—Manage and monitor multiple local and remote clusters from a single unified Web console.
- **“Fire Drill” DR testing**—Safely test that a DR site’s applications, servers, and storage will fully recover after a primary site outage.
- **Optimized for Microsoft SQL and Exchange**—Utilize specialized agents for SQL Server, Exchange, Oracle,® SharePoint,® Enterprise Vault,™ File/Print, and NetBackup™; utilize generic agents to cluster any application.
- **Advanced failover logic**—Ensures that application uptime is maximized and server resources are utilized as efficiently as possible.
- **Replication integration**—VCS manages replication roles and failback between sites, with support for the Veritas Volume Replicator Option as well as other array vendors’ replication solutions.
- **Support for multiple platforms**—Standardize on VCS across multiple operating systems and arrays to reduce administrative and hardware costs. Save by clustering on the Standard Edition of Microsoft Windows Server.™

Figure 1. In the event of failure of a mission critical application, Storage Foundation HA for Windows gracefully fails over the application stack, including associated directory, network and disk group resources.
**Availability across any distance**

Whether it’s a mission-critical Exchange email infrastructure or a critical CRM and ERP applications using SQL Server databases, Veritas Storage Foundation HA enables local, metropolitan, and wide area high availability and disaster recovery (DR) using a single solution.

Veritas Cluster Server can scale from a simple 2-node local cluster up to a 32-node cluster that spans thousands of kilometers across different IP subnets. Upon failover to a different IP network, VCS will update the application’s network identity so clients can connect to the DR site. VCS also automates the replication takeover so that replicated storage groups are imported and replication roles are reversed. Finally, users can increase heartbeat latency between sites up to 1,500 milliseconds in order to add additional timeout tolerance for distant clusters.

**No quorum disk**

VCS does not require a quorum disk to maintain cluster configuration information, unlike other clustering solutions. Instead, each node in the cluster synchronizes its configuration information and status with the other nodes using a proprietary network protocol. As a result, there is no single point of failure with VCS, a vital requirement for true HA.

In addition, with VCS there is no requirement for a majority set of nodes to be online in order for services to continue running. Other solutions require extra server hardware to ensure that a majority is maintained after multiple failures or a site outage. By eliminating this requirement, VCS gives users the flexibility to run fewer servers at a DR site relative to a primary site cluster. This saves hardware and administration expenses.

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**Figure 2. A scalable architecture enables growth from local to MAN to wide area geographic distances using a single solution.**
**Centralized management**

The Veritas Cluster Server Web-based Cluster Management Console (CMC) simplifies the task of managing multiple clusters. CMC provides a centralized GUI to monitor, manage, and configure every VCS cluster running in multiple data centers.

With CMC, it is possible to set cluster attributes for a single cluster or update values globally across all clusters with the click of a button. Also, users can run detailed historical reports that measure SLAs in aggregate and track results over time. Notification policies across all clusters can be easily modified. Administrator rights and roles can be set for different users in the IT organization. Most importantly, CMC provides a single place to instantly view the health of all clustered applications in the data center.

**“Fire Drill” DR testing**

In today’s complex IT environments, it is vital that disaster recovery sites are tested regularly. Unfortunately, most companies without VCS never test their DR plans because traditional DR testing is risky and requires actual downtime at the primary site. With the VCS Fire Drill feature, it is possible to test DR plans without affecting operations at the primary site. Fire Drill creates a safe bubble instance on the secondary where applications are brought online using a duplicate copy of the data, which ensures that there is no chance of data corruption or interruption of replication. Only by actually bringing an application online from beginning to end can users be sure they will be able to recover operations to the DR site when a primary site outage actually occurs.

**Optimized for SQL and Exchange**

Veritas Cluster Server provides off-the-shelf support for a wide range of applications, including but not limited to, Microsoft Exchange 2003, Microsoft SQL Server 2005, Oracle 11i, Microsoft SharePoint 2003, Enterprise Vault 6.0, NetBackup 6.0, Microsoft File Server, and Microsoft Print Server. In addition, VCS provides a utility to easily cluster any off-the-shelf or custom application using generic agents. VCS manages more than just the application instance; it manages the complete application stack, from runtime processes down to the NIC card and disk group, ensuring a robust and graceful failover of all associated resources.
Veritas Cluster Server enables a clustered application to be managed as a complete service group that contains all the hardware and software components required to run the service.

**Advanced failover logic**

With advanced failover logic, IT personnel can set failover policies based on server capacity thresholds and available resources. VCS chooses the best host for a specific application at the time of failure based on application needs and the current state of resources in the cluster. It allows true N+1 “roaming spare” capability for maximum availability without the cost of dedicated spares per application. It is possible to easily run eight or more application nodes at near maximum capacity, with one spare server. VCS automatically chooses the empty or least loaded server on any failure, and automatically adds repaired servers back into this selection pool when they rejoin the cluster. Advanced failover logic in VCS ensures that application uptime is maximized and that server resources are utilized as efficiently as possible.

**Replication integration**

Utilizing only a data replication solution to keep a current copy of critical data at a remote location in order to protect against failure of an entire site does not by itself protect enterprises from costly and damaging downtime. A good disaster recovery plan should include both data and application availability against all odds. Combined, Veritas Cluster Server and Veritas Volume Replication provide a fully integrated solution for data center availability.

Veritas Cluster Server for Windows can be configured to manage replication services so that when an application failure occurs, 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.

**Support for multiple platforms**

Storage Foundation HA for Windows is designed specifically for Windows Server 2003 and 2000. On UNIX and Linux platforms, the user interface and core technology of Veritas Cluster Server is very similar, making it easy to standardize across all operating system platforms with one clustering solution. Standardizing lowers training and administration costs and reduces the complexity of managing a data center. Storage Foundation for Windows supports multiple storage array vendors, enabling one storage management tool to be used across all arrays and providing freedom of choice in storage hardware.
**Supported platforms**

- Microsoft Windows Server 2003 32-Bit (Standard, Web, Enterprise, Datacenter)
- Microsoft Windows Server 2003 x64 Editions (Standard, Enterprise, Datacenter)
- Microsoft Windows Server 2003 SP1 for Itanium®-based systems (Enterprise, Datacenter)
- Microsoft Windows 2000 (Server, Advanced Server, Datacenter)

Veritas Cluster Server is also available on: IBM AIX®, HP HP-UX, SUSE Linux, Red Hat® Linux, Sun™ Solaris,™ Vmware.

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**Storage Foundation HA for Windows options and agents**

- **Global Cluster Option**—The Global Cluster Option monitors and manages the replication jobs and clusters at each site. In the event of a site outage, the Global Cluster Option will control the shift of replication roles to the secondary site, bring up the critical applications, and redirect client traffic with a single mouse click.

- **Volume Replicator Option**—The Volume Replicator Option allows data to be replicated between any storage device over an IP network.

- **Dynamic Multi-pathing Option**—The Dynamic Multi-pathing (DMP) Option adds fault tolerance to disk storage by making use of multiple paths between a computer and individual disks.

- **FlashSnap™ Option**—Veritas FlashSnap makes it possible to create independently addressable point-in-time snapshots that are full mirror copies of the volumes on a server. These snapshots can be easily moved to another server for backup or other purposes.

- **Microsoft Exchange Server Agent**—The High Availability Agent for Exchange Server works to keep Microsoft Exchange Server highly available by detecting any failures and automatically bringing the application online again.

- **Microsoft SQL Server Agent**—The High Availability Agent for Microsoft SQL Server monitors Microsoft SQL Server 2000 and 2005 on a VCS cluster to ensure high availability by automatically detecting faults and bringing a downed database back online.

- **Oracle Agent**—The High Availability Agent for Oracle monitors Oracle 10g and 11i on a VCS cluster to ensure high availability by automatically detecting faults and bringing a downed database back online.

- **Veritas Volume Replicator Option**—Make sure replication is always available with the Veritas Cluster Server agent for Veritas Volume Replicator. This agent monitors the replication services to make Veritas Volume Replicator highly available.

- **Hardware Replication Agents**—Veritas Cluster Server agents for hardware replication monitor the status of the replication service and, in case of failure, takes corrective action to maintain data replication between sites, regardless of distance. There are agents to support EMC SRDF/A, EMC MirrorView/A, Hitachi TrueCopy, IBM PPRC, and Network Appliance SnapMirror.

For more information visit: www.veritas.com/vcs.
Data Sheet: Storage Management
Veritas Storage Foundation HA for Windows by Symantec

**Related information**
- Veritas Storage Foundation *for Windows* data sheet
- Veritas Services data sheet
- Veritas Volume Replicator data sheet
- Veritas Supported Clustering Architectures data sheet
- HCL: http://support.veritas.com

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Symantec is the world leader in providing solutions to help individuals and enterprises assure the security, availability, and integrity of their information. Headquartered in Cupertino, Calif., Symantec has operations in more than 40 countries. More information is available at www.symantec.com.

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