



Network Computing: Request for Information Data Protection through Replication

VENDOR RESPONSE:

Vendor company name: VERITAS Software

Vendor contact name: Dawn Colossi or Sheri Atwood

Vendor contact telephone number: 732-7802544; 650-527-4843

Vendor contact e-mail address: dcolossi@usa.net; sheri.atwood@veritas.com

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ARCHITECTURE

VERITAS REPLICATION OVERVIEW

In the event of a disaster, VERITAS replication technologies can quickly recover Darwin Groceries' critical data and applications. With a VERITAS replication solution, Darwin can choose to replicate its data via a storage area network or over any IP network in order to meet their disaster recovery needs and easily test its disaster recovery solution. Unlike proprietary, inflexible hardware approaches, VERITAS' replication technologies are not dependent on any specific storage hardware or switch platform. For example, replication can occur between storage arrays from the same vendor, regardless of array model or size, or replication can occur between different storage vendor's arrays. Therefore, Darwin Groceries can use these technologies to replicate data between any major storage platform. In addition, VERITAS replication technologies support all major operating systems including IBM AIX, HP HP-UX, Sun Solaris, Microsoft Windows, Red Hat Linux and SUSE Linux. Finally, VERITAS replication solutions support all major database management systems and are certified by Oracle, Darwin's chosen database vendor.

VERITAS' software-based replication provides a reliable, efficient and cost-effective solution for mirroring data sets, either locally or over any distance, and allows the organization to fully test the disaster recovery solution without impacting the production environment.

VERITAS SOFTWARE RECOMMENDATION

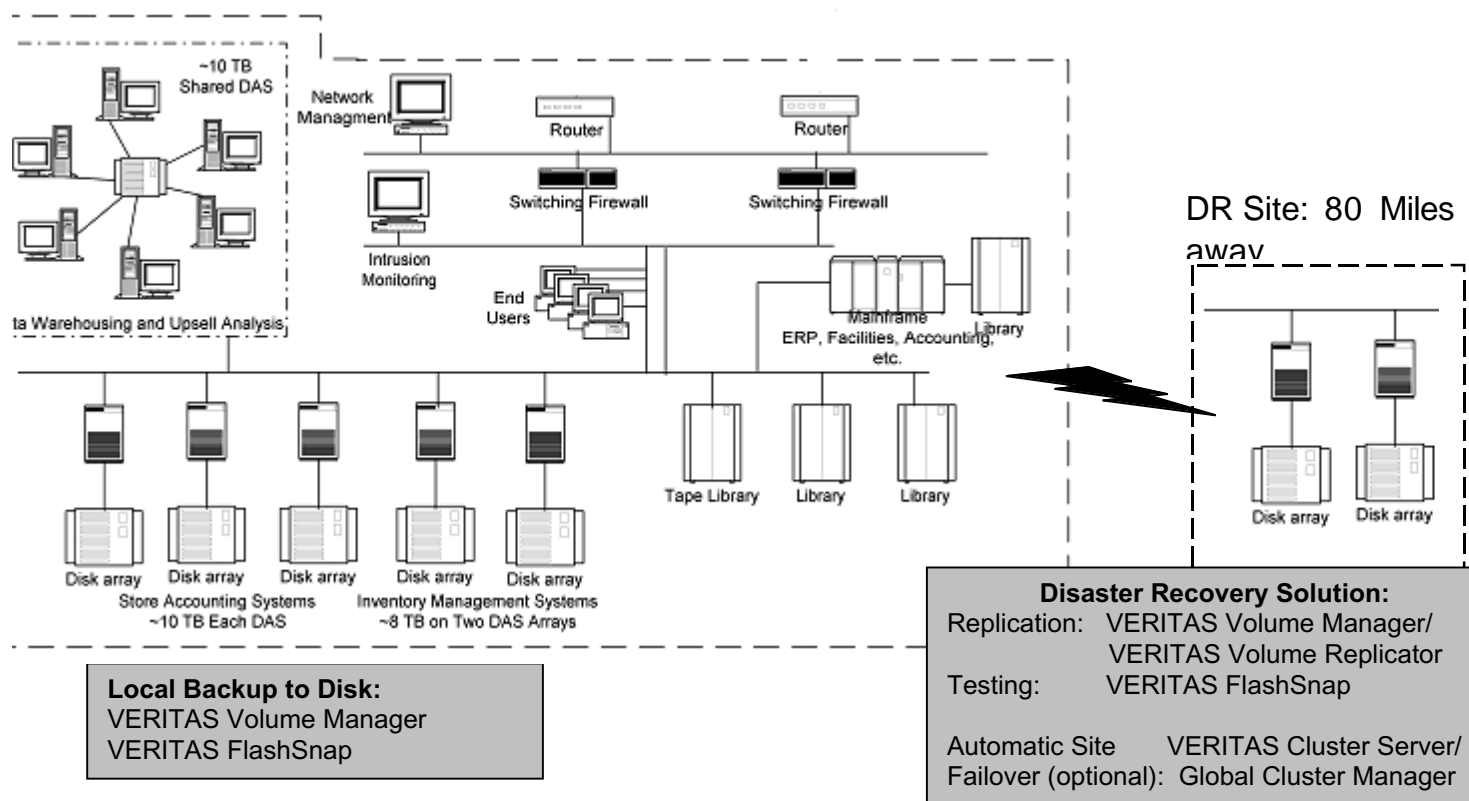
VERITAS proposes the following software components for the Darwin Groceries Disaster Recovery environment:

- VERITAS Volume Manager
- VERITAS FlashSnap
- VERITAS Volume Replicator

The following components are optional, but highly recommended to ensure for quick recovery of the applications after a disaster occurs:

- VERITAS Cluster Server
- VERITAS Global Cluster Manager

VERITAS SOFTWARE RECOMMENDED ARCHITECTURE FOR DARWIN GROCERIES:



VERITAS VOLUME MANAGER

VERITAS Volume Manager, the industry-leading storage virtualization solution, pools disks into logical volumes and mirrors those volumes between any storage devices. This improves disk utilization and creates a duplicate copy of the data for disk-based backup purposes.

VERITAS FLASHSNAP

VERITAS FlashSnap is a flexible and easy to use point-in-time copy solution that can be used at either the primary or secondary locations. FlashSnap enables administrators to create point-in-time copies of data with minimal impact to users or applications. With the point-in-time copy of data the administrator can instantaneously restore the data at the volume or file level allowing for easy data restores and eliminating the need for tapes at the primary site. In addition, VERITAS FlashSnap can be used to perform a disaster recovery test of the replicated data at the secondary location without disruption to the production environment.

VERITAS VOLUME REPLICATOR

For organizations who wish to replicate data natively over an IP network, VERITAS Volume Manager has an optional capability called Volume Replicator. VERITAS Volume Replicator reliably, efficiently and consistently replicates data over any distance to remote locations over a standard IP network for maximum business continuity, removing the need for expensive proprietary network hardware, and the need to have the exact same storage hardware at every site.

VERITAS Volume Replicator maintains data consistency at all times and delivers uncompromised data integrity at secondary locations whether operating in synchronous or asynchronous mode. Synchronous replication does not allow the secondary to get behind, or lag, thereby eliminating the threat of any data loss. Like the synchronous replication, asynchronous mode guarantees data consistency or integrity, but allows the secondary to lag slightly (typically milliseconds or less). This asynchronous capability makes VERITAS Volume Replicator ideally suited to provide maximum performance to the production

environment while allowing that data to be replicated over any distance, whether the secondary site is 80 miles away or 8,000 miles away. By faithfully maintaining write order fidelity, VERITAS Volume Replicator ensures data integrity in any mode for any application environment, including all major database management platforms. Volume Replicator is certified with Oracle in synchronous and asynchronous mode, unlike the leading array based replication provider.

Organizations can quickly and easily switch between synchronous and asynchronous mode as their needs change. For example, an organization can set policies based on data loss or application performance impact. Darwin can choose to replicate in synchronous mode to the secondary site while maintaining the flexibility to automatically switch to asynchronous mode if the primary application is impacted by the replication. Once in asynchronous mode additional policies can be set to ensure the secondary does not fall too far behind ensuring the amount of data loss always meets the organizations business requirements.

For Darwin Groceries, Volume Replicator can replicate the data to the secondary location 80 miles away and the data loss should be 1 minute or less. In addition, Volume Replicator is extremely flexible and allows organizations to easily change the configuration as the environment grows. Volume Replicator is also very scalable and allows organizations to replicate data to 32 total locations for one to one, one to many and many to one scenarios.

Should a disaster occur, Darwin can easily failover operations to the secondary site by stopping replication at the primary location and mounting the replicated data at the secondary site. This manual process should take several minutes. If Darwin wants to decrease the amount of downtime associated with the failover it can purchase the optional capabilities of VERITAS Cluster Server and Global Cluster Manager (see below for more information). In addition, Darwin can quickly and easily fallback operations to the original primary site and only the changes that occurred while operations were occurring at the secondary location need to be sent over the wire.

OPTIONAL CAPABILITIES:

DECREASE APPLICATION DOWNTIME WITH VERITAS CLUSTER SERVER AND VERITAS GLOBAL CLUSTER MANAGER

The full integration of VERITAS Cluster Server, VERITAS Volume Replicator and VERITAS Cluster Manager provides a powerful disaster recovery solution. VERITAS Cluster Server handles local availability issues. VERITAS Volume Replicator replicates critical data to a remote site and VERITAS Global Cluster Manager monitors and manages the clusters at each site. In the event of a site failure or complete failure of applications at the primary site, Global Cluster Manager will notify the administrator that a disaster may have occurred. The administrator will then log onto a web-based GUI from anywhere in the world. If a disaster has occurred at the primary site the administrator will need to click one button. At that time the data that has been replicated is mounted, the critical applications are brought up and all the client traffic is redirected to the secondary site. This solution can automate the manual process associated with bringing up a disaster recovery site and reduce the amount of downtime associated with a disaster to a few minutes.

TOPOLOGY

At the disaster recovery site, Darwin will need adequate host resources to receive replicated data and provide the ability to turn on the application should a disaster occur in order to meet the 30 minute recovery time. In addition, Darwin will need adequate storage at the remote site, although this storage can be from any vendor, including simple JBOD. Because VERITAS replication is hardware independent and supports IP natively there is no need for specialized converter boxes to replicate over IP, thereby saving Darwin money associated with implementing a disaster recovery solution. In addition, VERITAS' replication technologies can replicate data through the Darwin firewall thereby ensuring the data is secure.

WIDE AREA NETWORK

VERITAS replicates natively over IP and does not require dedicated Fibre Channel between sites. Therefore, no changes to the wide area network are required and no specialized networking converter boxes will be needed. In addition, VERITAS offers a free tool to provide assistance in determining the amount of bandwidth that is required or the tool can analyze the available bandwidth over the WAN to determine if the available network is adequate for Darwin's needs.

MANAGEMENT

VERITAS' replication technologies provide an easy and intuitive GUI in addition to command line interface that allows Darwin to easily manage the replicated data. The VERITAS console allows the administrator to view replication status including replication mode, amount of data being replicated and the difference between the primary and secondary sites. Because VERITAS replication supports SNMP traps users can be alerted to any error or state change conditions that may arise.

If Darwin chooses to also implement the clustering capabilities that VERITAS offers it will be provided the ability to manage all of their applications and replication from a single web-based GUI. This GUI will notify Darwin of any system, application, replication or site downtime. If an outage occurs the administrator will be able to quickly, easily and automatically migrate operations from one site to another.

DEPLOYMENT

VERITAS offers world-class professional services that can provide assistance from initial architecture, customer staff training, customized solution documentation and full implementation of the solution into the production environment. The estimated time to deploy replication into the Darwin production environment is three days and will cost approximately \$9,500 per server, list price. Once the solution is in production VERITAS world class technical support organization can be on-call to assist twenty four hours a day, seven days a week and three hundred and sixty five days a year. If Darwin administrators would like additional training on the products they can take an optional seven day training class offered by VERITAS University which will cover the basic of administration and troubleshooting of VERITAS Volume Manager, FlashSnap and Volume Replicator for a list price of \$4,900.

As the volume of data is increased, VERITAS replication solutions can be expanded in real-time without application downtime. This function can be done onsite by the administrator and does not require any onsite professional services.

SOLUTION PRICING:

VERITAS technologies are priced per server within the environment regardless of the amount of data replicated. The following pricing is list price for any UNIX platform and is based on a Tier 1 server. As the server size increases the price will also increase

VERITAS Replication Technologies	
	Price per server:
VERITAS Volume Manager	\$1,895
VERITAS FlashSnap	\$1,495
VERITAS Volume Replicator	\$4,495
Professional Services for installation	\$9,500
Total for replication licenses and installation per server	\$17,385
Reoccurring Costs for Replication Solution:	
Technical Support for all replication technologies (1 yr, 24 x7) per server	\$1,814
Optional Training:	
VERITAS University 7-day training course (VM, FlashSnap, VVR)	Total Price: \$4,900
Optional Capabilities to speed recovery time via Clustering:	
VERITAS Cluster Server	\$2,995 / server
Professional Services for installation	\$6,000 / server

Total for Cluster Server License and Installation	\$8,995 /server
VERITAS Global Cluster Manager	\$3,790 / site
Professional Services for installation	\$8,500 / site
Total for Global Cluster Manager License and Installation per site	\$12,290 / site
Reoccurring Costs for Clustering Solution:	
Technical Support for all clustering technologies (1 yr, 24 x7)	\$1033/ server

ADDITIONAL 3RD PARTY COMPONENTS

Darwin Groceries will need to provide additional host resources at the secondary site to receive replication and turn on applications should an outage occur. In addition, Darwin will need adequate storage at the remote site, although this storage can be from any vendor, including simple JBOD. Finally, Darwin will need to purchase IP bandwidth to connect between the two sites.

BENEFITS:

VERITAS Replication technologies allow organizations to replicate their primary location data to a secondary site in order to meet stringent data availability requirements. This replication can occur without impacting the production environment thereby meeting the shrinking backup windows that many organizations face. Because the data resides on disk at the secondary location, should an outage occur, the administrator would be able to access the data immediately without having to go through the time consuming and manual process of restoring the data from tapes. The VERITAS replication technologies are extremely reliable and provide uncompromised data integrity at all points in time

In addition, if the organization chooses VERITAS, it has the flexibility of choosing any hardware vendor. This flexibility provides dramatic cost savings because the organization is no longer locked-in to a single hardware vendor, thereby eliminating the need for an identical hardware topology at the secondary site.

VERITAS replication technologies support IP natively so Darwin will not need to purchase expensive networking hardware and it only needs enough bandwidth between sites to replicate the amount of data that changes. Finally, VERITAS replication technologies have easy-to-use management consoles that can change replication configurations on the fly without affecting the production environment or requiring professional services to implement the change.

With VERITAS replication technologies Darwin has the flexibility to choose any hardware vendor while ensuring that its data and applications are always protected, even if a disaster strikes.

MARKET VIABILITY

VERITAS Software Corporation (NASDAQ: VRTS) is headquartered in Mountain View, Calif., and employs more than 6,300 people in 36 countries. With annualized revenues over \$1.5 billion in 2002, VERITAS Software ranks among the top 10 software companies in the world and is the leader in backup, replication, storage management and high availability solutions.

VERITAS has the fastest growing replication products of the top ten replication vendors, according to Gartner. VERITAS has sold over hundreds of thousands of licenses of VERITAS Volume Manager and more than 6,500 licenses of VERITAS Volume Replicator.

REPLICATION MARKET COMPARISON:

Feature	VERITAS	EMC SRDF	IBM PPRC	HDS True Copy
Storage Independent	Yes supports replication between most storage vendors	Symmetrix Only	IBM Shark Arrays Only	HDS 9900's only
Synchronous Mode	Yes	Yes	Yes	Yes
Maintain write order fidelity in asynchronous mode	Yes	No	No	Yes
Oracle Certification in synchronous and asynchronous mode	Yes	No (certification in synch mode only)		Yes
Network Infrastructure	Native IP	ESCON, Fibre Channel (special FC/IP converters needed for IP replication)	ESCON	ESCON, Fibre Channel (special FC/IP converters needed for IP replication)
Distance Limitations	none	43km, need specialized distance extenders for longer distances	43km, need specialized distance extenders for longer distances	43km, need specialized distance extenders for longer distances
Total number of sites	32	1 (but supports cascading)	1	1
Management interface	CLI, GUI	CLI, GUI for additional cost	CLI	CLI
Flexibility	Change configurations on the fly, grow volumes online, switch between replication modes on the fly, data can span arrays	All data must reside in single array, any changes require professional services intervention	All data must reside within single array, no online management	All data must reside within single array, no online management

KEY FACTORS DARWIN SHOULD CONSIDER WHEN LOOKING AT REPLICATION TECHNOLOGIES:

- Hardware independence
- Native IP support
- No requirement for specialized networking converter devices
- Certification in synchronous and asynchronous mode with Oracle
- No distance limitations
- Intuitive management GUI for no additional cost
- Ability to change configurations on the fly
- Support in wide-area clustering solutions

SUMMARY

VERITAS' replication technologies will allow Darwin to easily and efficiently replicate its data to a disaster recovery site 80 miles away while providing them the flexibility to use any hardware vendor, test the disaster recovery solution on a regular basis and easily change the configurations as the business grows.