

# Veritas Storage Foundation™ from Symantec

Maximize your storage efficiency, availability, agility, and performance

## Data Sheet: Storage Management

### Overview

Veritas Storage Foundation™ from Symantec maximizes storage efficiency, data availability, operating system agility, and performance across heterogeneous server and storage environments. Unlike point solutions, Veritas Storage Foundation enables IT organizations to manage their storage infrastructures in a centralized fashion. With advanced features such as Dynamic Multi-Pathing, deduplication, compression, thin reclamation, storage tiering, online configuration and administration, data migration, local and remote replication, and Veritas™ Operations Manager (an easy-to-use centralized management console), Veritas Storage Foundation enables organizations to reduce operational costs and capital expenditures across storage from a variety of vendors.

### Highlights

- **Increased storage utilization across heterogeneous environments**—Provides comprehensive insight into the storage environment, enabling improved usage and efficiency across all major operating systems, including Oracle® Solaris™, HP-UX®, IBM® AIX®, Red Hat Enterprise Linux, SUSE® Linux, Oracle® Enterprise Linux (RHEL compatible mode), and Microsoft® Windows®, and storage hardware, including EMC, HDS, IBM, NetApp, HP, Dell Compellent, and more
- **Deduplication and compression**—Reduces the primary storage footprint with built-in deduplication and compression
- **I/O path availability and performance**—Efficiently spreads I/Os across multiple paths for maximum performance, path failure protection, and fast failover
- **Automated storage tiering**—Seamlessly and transparently moves data based on business value
- **Centralized storage management**—Manages thousands of hosts and multiple petabytes of storage from a central

interface to improve operational efficiencies across a heterogeneous infrastructure

- **Simplified operating system migration**—Makes data compatible between operating systems
- **Thin Provisioning optimization**—Nondisruptively migrates data to thinly provisioned storage with the ability to reclaim capacity automatically
- **Database storage management**—Simplifies database management while achieving high availability and superior performance for DB2®, Oracle, Sybase®, and SQL databases
- **Local and remote data protection**—Protects data across any environment with point-in-time copies, mirroring, and data replication

### Increased storage utilization across heterogeneous environments

IT organizations struggle with soaring storage costs and capacity that becomes wasted through the regular cycle of operations. In some cases, storage operations can result in application downtime. Veritas Storage Foundation enables administrators to improve storage utilization and capacity management across heterogeneous operating systems and storage hardware. Storage volumes and file systems can be grown or shrunk dynamically, and storage can be provisioned to new applications without modifications or end-user downtime. Veritas Storage Foundation automates daily and repetitive storage tasks and performs them while keeping applications online, including RAID reconfiguration, defragmentation, file system resizing, volume resizing, and storage migrations, even across arrays from multiple vendors.

### Deduplication and Compression

Explosive data growth is a major challenge for IT organizations. One remedy is simply to purchase more storage arrays to house the data, resulting in high costs and low efficiency. To address data growth, Veritas Storage Foundation provides deduplication and compression in the file

system, enabling organizations to reduce their storage footprint across heterogeneous operating systems. Deduplication and compression use smart algorithms to analyze patterns within the data to realize space savings. Deduplication is supported on IBM-AIX, Red Hat Linux and SUSE Linux while Compression is supported on Solaris, Red Hat Linux and SUSE Linux.

Veritas Storage Foundation's deduplication capability includes intelligence at the file system level to recognize redundant data, saving only the unique blocks to disk and reconciling the information with the original copy. Deduplication reduces storage space requirements for virtual environments, home directories, and data repositories while improving overall storage performance. Veritas Storage Foundation provides up to 80 percent deduplication ratios, depending on workload characteristics.

Veritas Storage Foundation compresses data by analyzing data patterns and using that information to optimize storage. File system compression is especially effective for read-intensive data such as infrequently accessed archival data. Compression can also improve storage performance in bandwidth constraint instances between the server and the storage area network (SAN). Veritas Storage Foundation compression capabilities will reduce the storage requirements of some data sets by up to 70 percent.

Veritas Storage Foundation allows users the flexibility to choose which data to compress or deduplicate, helping them make optimal decisions based on their workloads and usage patterns.

### I/O path availability and performance

I/O paths can suffer from poor performance in data retrieval due to I/O operations saturating the data path or even worse access may be completely lost when a network connection goes down or fails. To address these issues, Veritas Storage Foundation includes Dynamic Multi-Pathing that enhances storage I/O performance and availability across heterogeneous server and storage infrastructures. Dynamic Multi-Pathing has intelligent algorithms to load-balance

storage I/Os across multiple host bus adapters (HBAs) for faster throughput, and increases application availability by rerouting I/Os to healthy data paths in the event of a path failure. Additionally, Dynamic Multi-Pathing on multiple hosts can be managed centrally with Veritas Operations Manager.

### Automated storage tiering

Not all data has the same value. However, in many cases all data is treated equally in terms of where it is stored, resulting in a mismatch between the importance of the information and the availability and performance characteristics of the storage resources it consumes. With the SmartTier capabilities of Veritas Storage Foundation on UNIX and Linux operating systems, unimportant or out-of-date files can be moved to less expensive storage devices without changing the way users or applications access those files. SmartTier enables organizations to define data movement via policies based on partition names, log files, or database files. Data movement can be defined for file objects as well as for entire files on individual volumes.

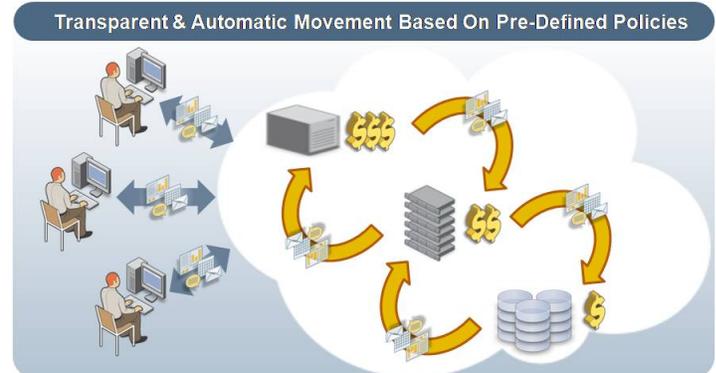
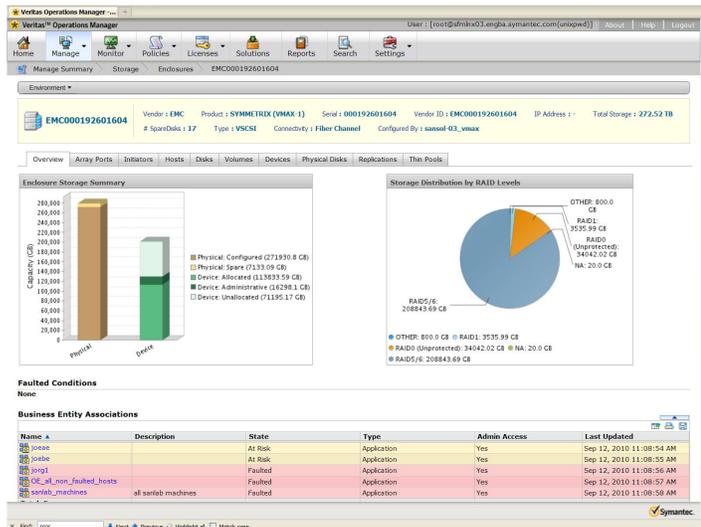


Figure 1. SmartTier offers automated and transparent optimization of data placement on tiers of storage across hard disk drives and solid state drives.

### Centralized storage management

Understanding the dependencies of applications to underlying virtual and physical server and multivendor storage infrastructures is a challenge. Manually mapping these components together is difficult, and trying to take action to manage the environment is nearly impossible.

With Veritas Operations Manager, organizations can centrally manage their application, server, and storage environments. This leads to faster application deployment times and higher service levels, reduces the risk of human error, and provides comprehensive visibility throughout the environment.

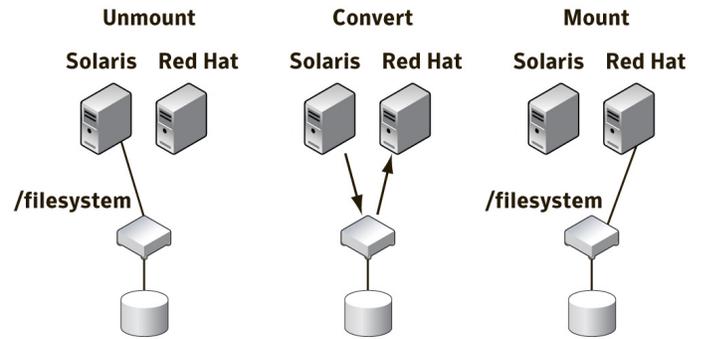


**Figure 2. Veritas Operation Manager provides centralized application, server and storage management capabilities across a heterogeneous infrastructure.**

In addition, Veritas Operations Manager enables administrators to identify and visualize potential problems with applications and storage resources by correlating health and status information across multiple applications, servers, storage, and replication resources. This increased visibility enables rapid problem resolution that typically spans multiple organizational structures.

### Simplify operating system migrations

There are several reasons to move application workloads from one operating system platform to another, among them lower costs and better operating system performance. However, an operating system migration is often a tedious and time-consuming project that typically requires an application outage that could result in lost revenue or employee productivity. Veritas Storage Foundation addresses these challenges by making the same set of data accessible to UNIX® and Linux operating systems while applications remain available.



**Figure 3. Export data from one operating system and import it on another in minutes, without creating a copy of the data or moving the data using Portable Data Containers.**

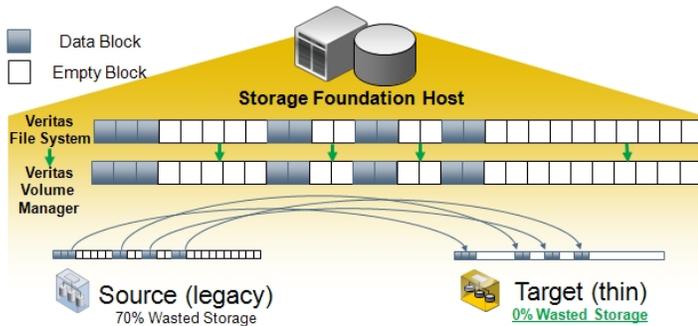
With Portable Data Containers, administrators can export data from one operating system and import it on another in minutes, without ever creating a copy or moving the data, resulting in less downtime.

### Thin Provisioning optimization

Thin provisioning is a hardware feature that enables storage capacity to be overallocated to applications and physical capacity to be consumed only as applications write data. However, over time, as data is deleted, the array does not have the capability to reclaim capacity, which is simply wasted until an administrator manually reclaims the storage. Veritas Storage Foundation offers the industry's only cross-platform file system that is thin-friendly, enabling administrators to automatically optimize thin provisioned storage and maximize storage utilization.

In addition to a thin-friendly file system, Veritas Storage Foundation offers SmartMove and the Thin Reclamation API, which enable organizations to get thin and stay thin across all operating systems—Unix, Linux, and Windows—and any storage array.

- SmartMove provides the capability to perform efficient host-based data migration for Unix, Linux, and Windows platforms across heterogeneous storage arrays. It also enables the migration from thick (traditional) storage to thin storage and the automatic reclamation of unused space, all while keeping applications online.



**Figure 4. With SmartMove, mirroring is enhanced with the host file system knowledge. Tight integration makes the volume manager aware of the free blocks that don't need to be copied; only the useful data is copied.**

- To stay thin over time, Veritas Storage Foundation offers the Thin Reclamation API. This API enables automated, granular, online reclamation of allocated but unused thin storage. Veritas Storage Foundation uniquely leverages the server knowledge of actual storage usage and the capabilities of thin reclamation-compliant storage arrays to reclaim allocated but unused storage, making thin storage reclamation fully automated and transparent to the server configuration and the applications. Thin Reclamation is supported on a wide range of array models from all storage vendors such as EMC, Hitachi, Oracle, NetApp and many others.

Both SmartMove and the Thin Reclamation API can be managed from Veritas Operations Manager.

### Database storage management

The major concern in any database environment is meeting and exceeding performance SLAs. Veritas Storage Foundation improves the overall performance of database environments through the use of database accelerators. The net benefit is database performance equal to raw disk partitions, but with the manageability benefits of a file system.

In addition, manual database tasks such as RAID reconfiguration, volume and file system resizing, and snapshots are inefficient, time consuming, error prone, and always seem to affect performance negatively. To ease the burden of database administration, Veritas Storage Foundation provides the flexibility to manage database

volumes and files using the Web-based interface of Veritas Operations Manager or through a command-line interface. Veritas Storage Foundation automates many of these manual database storage management tasks, thereby reducing administrative workload as well as human error.

### Local and remote data protection

Data protection is a concern of any IT organization. When it is implemented across heterogeneous operating systems, several point tools are required, making management of copies a difficult task. Veritas Storage Foundation provides a single tool to protect data, with copy service options that address both local and remote replication needs across all major operating systems. With FlashSnap™ technology, administrators can create point-in-time copies with minimal impact on applications and users. Point-in-time copies can be accessed from the same server or be imported easily to another host, enabling users to leverage storage hardware economics by taking advantage of the heterogeneous, tiered storage support offered by Veritas Storage Foundation. These copies can either be full or space-optimized volume snapshots or database clones, which can be resynced quickly. This allows users to perform resource-intensive processes such as backup, testing, decision support, and reporting off-host.

For mission-critical applications that require recovery at remote sites, Veritas Replicator, an option of Veritas Storage Foundation, enables efficient replication of data over IP networks. This host-based technology enables data to be replicated between multivendor storage arrays, giving organizations an extremely flexible, cost-effective alternative to traditional array-based replication architectures.

### Sized for your needs

Choose the product that is appropriate for your organization's requirements:

- **Veritas Storage Foundation Enterprise**—Intended for enterprise environments, this version offers full functionality, including FlashSnap, SmartTier,

deduplication, compression, thin provisioning optimization, and storage checkpoints.

- **Veritas Storage Foundation Standard**—Intended for systems and workloads that need only some advanced features, this product offers File System and Volume Manager capabilities and includes database accelerators. It also includes advanced features such as SmartTier and compression.
- **Veritas Storage Foundation Basic**—Intended for smaller systems, this version is available at no cost and provides the same robust features as Veritas Storage Foundation Standard, but is designed for system workloads with no more than four volumes and/or four file systems per OS image, and/or two processors/sockets in a single physical system.

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#### Other product highlights

- **Simpler, leaner, and more resilient**—Offers zero boot install and upgrade, rolling upgrades, smaller host footprint, and keyless feature enablement
- **Online administration**—Limits the amount of time disks need to be offline for maintenance by performing volume and file system resizing, domain reconfiguration, backup, and off-host processing while the data remains online and available
- **Storage checkpoints**—Instantly creates database and disk backups of files or file systems that require no additional disk space

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#### Supported operating systems

- HP-UX
- IBM AIX
- Microsoft Windows
- Oracle Enterprise Linux (RHEL compatible mode)
- Oracle Solaris
- Red Hat® Linux

- SUSE Linux

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#### More Information

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<http://enterprise.symantec.com>

##### *To speak with a Product Specialist in the U.S.*

Call toll-free 1 (800) 745 6054

##### *To speak with a Product Specialist outside the U.S.*

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