Veritas Storage Foundation™ from Symantec

Simplified, Scalable and Cost-Effective Storage Management

Overview

Veritas Storage Foundation™ from Symantec provides a complete solution for heterogeneous online storage management. Based on the industry-leading Veritas™ Volume Manager from Symantec and Veritas™ File System from Symantec, it provides a standard set of integrated tools to centrally manage explosive data growth, maximize storage hardware investments, provide data protection, and adapt to changing business requirements. Unlike point solutions, Storage Foundation enables IT organizations to manage their storage infrastructure in a centralized consistent fashion. With advanced features such as centralized storage management, online configuration and administration, SmartTier[1], Dynamic Multi-Pathing, data migration, and local and remote replication, Storage Foundation enables organizations to reduce operational costs and capital expenditures across the data center.

Highlights

- **Increased storage utilization**—Maximize storage capacity across heterogeneous operating systems and storage hardware
- **I/O path availability and performance**—Efficiently spread I/O across multiple paths for maximum performance, path failure protection, and fast failover
- **Automated storage tiering**—Seamlessly and transparently move data based on its business value
- **Centralized storage management**—Manage multiple hosts from a central interface to improve operational efficiencies across a heterogeneous infrastructure
- **Seamless data migration**—Free data from technology changes with simple server migrations across different operating systems

- **Thin Provisioning optimization**—Simplify the management and provisioning of storage, while increasing storage utilization, lowering costs and improving operational efficiencies
- **Database storage management**—Simplify manageability while achieving high availability and superior performance for DB2®, Oracle®, Sybase® and MySQL® databases
- **Local and remote data protection**—Protect data across any environment with point-in-time copies and data replication
- **Multi-vendor hardware infrastructure**—Reduce capital expenditures with broad support for heterogeneous operating systems and storage hardware

Increased storage utilization

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 dynamically grown or shrunk, and storage can be dynamically provisioned to new applications without any modifications affecting the end user. Storage Foundation automates daily and repetitive storage tasks and performs them online, including RAID reconfiguration, defragmentation, file system resizing, and volume resizing.

Storage Foundation enables storage virtualization across a heterogeneous storage infrastructure whether there are multiple volumes within a single server or volumes that span and are visible to multiple servers. This improves storage utilization and sets the stage to seamlessly move data between different operating systems and storage arrays and spread I/O across multiple paths to improve performance.

---

[1] SmartTier includes and extends capabilities previously found in Dynamic Storage Tiering (DST)

Confidence in a connected world. ✔Symantec.

I/O path availability and performance

With the Dynamic Multi-Pathing (DMP) feature, storage I/O performance and availability are enhanced across a heterogeneous server and storage infrastructure. DMP has intelligent algorithms to load-balance storage I/Os across multiple host bus adapters (HBAs) for faster throughput, and increase the application's availability by rerouting I/Os to an available data path in the event of a path failure. Additionally, multi-host DMP can be centrally managed with Veritas™ Operations Manager from Symantec[2] . The improved load balancing and management capabilities enhance productivity and reduce application downtime.

Automated storage tiering

With the SmartTier capabilities of Storage Foundation, 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 name, log files or database files[3] . Data movement can be defined for file objects as well as entire files on individual volumes.

Because the Veritas File System can span multiple volumes, application/database information can be dynamically migrated across multiple volumes/tiers of storage hardware without changing the way the application and database access the information (the file system remains unchanged). This move is completely transparent to the users and applications that own the files—they don't need to know the files have moved. As data is moved to different storage tiers across hard disk drives and solid state drives[4] , the policies are centrally managed and dynamic, and support a heterogeneous server and storage infrastructure that requires no application, database, or backup/recovery policy modifications.
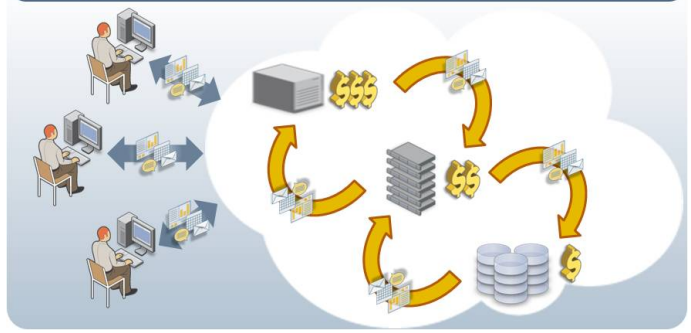

Figure 1. SmartTier offers automated and transparent optimization of data placement on tiers of storage across hard disk drives and solid state drives.

Centralized storage management

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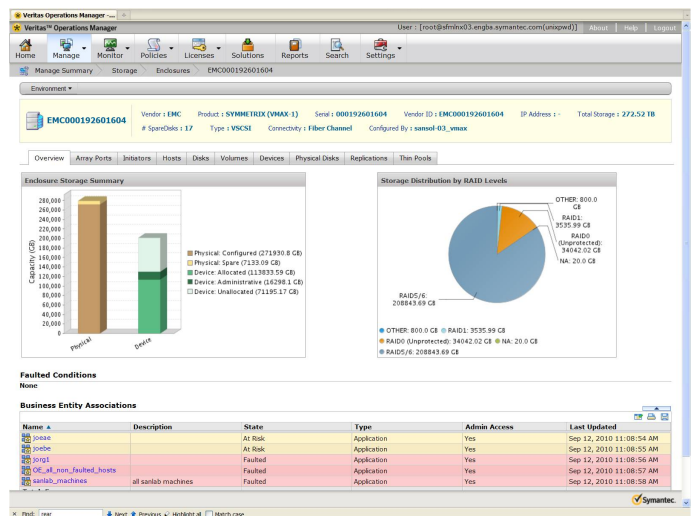

Figure 2. Veritas Operation Manager provides centralized application, server and storage management capabilities across a heterogeneous infrastructure.

Veritas Operations Manager enables administrators to identify and visualize potential problems with applications

---

[2.] Available at no cost. Veritas Operations Manager extends capabilities previously available in Veritas Storage Foundation Manager.

[3.] Previously available in Veritas Storage Foundation for Databases, this functionality is now available in Veritas Storage Foundation 5.1. For additional details, see the database storage management solutions guide.

[4.] New functionality available in Veritas Storage Foundation 5.1.

Confidence in a connected world. ✔Symantec.

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.

Seamless data migration

In addition to providing the same storage management tool for all operating systems, Storage Foundation can actually make the same set of data accessible to all major operating systems. Administrators no longer need to use NFS or tape to move data between operating systems.
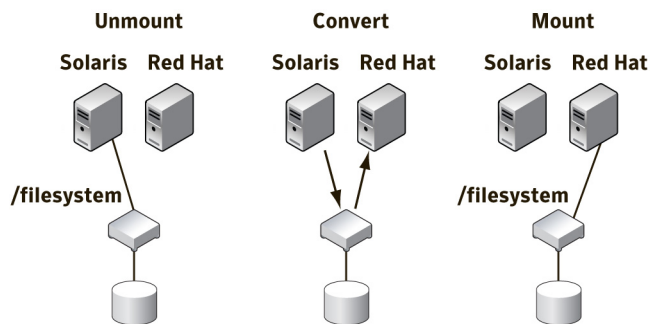
Figure 3. Deport data from one operating system and import it on another in minutes, without creating a copy of the data or moving the data using Portable Data Containers.

With the Portable Data Containers feature of Storage Foundation, administrators can deport data from one operating system and import it on another in minutes, without ever creating a copy of the data or moving the data. Storage Foundation quickly and automatically converts the data for the new platform.

Thin Provisioning optimization

Thin provisioning is a hardware feature that enables storage capacity to be over allocated to applications and physical capacity to be consumed only as applications write data. Storage Foundation offers the industry's only cross-platform file system that is thin-friendly, enabling administrators to optimize thin provisioned storage and maximize storage utilization.

In addition to a thin friendly file system, Storage Foundation offers SmartMoveTM 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, while keeping applications online.
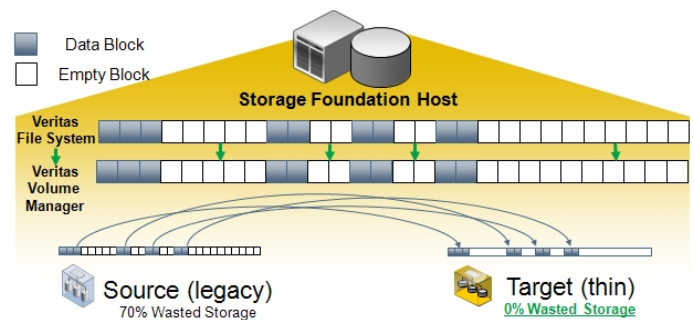
Figure 4. With SmartMove, mirroring is enhanced with the host file system knowledge. Tight integration makes the volume manager aware of the free blocks that don't need to be copied; only the useful data is copied.

To stay thin over time, Storage Foundation offers the Thin Reclamation API. The Thin Reclamation API enables automated, granular, online reclamation of allocated but unused thin storage. 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.

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

Database storage management[5]

Storage Foundation gives administrators the flexibility to manage database volumes and files using the web-based interface of Veritas Operations Manager or through a

---

[5.] Previously available in Veritas Storage Foundation for Databases, this functionality is now available in Veritas Storage Foundation 5.1. For additional details, see the database storage management solutions guide.

Confidence in a connected world. ✔Symantec.

command-line interface. Also, Storage Foundation automates many of the manual database storage management tasks, such as RAID reconfiguration, volume and file system resizing, and snapshots, thereby reducing administrative workload as well as human and operational errors.

The major concern in any database environment is maintaining superior performance and meeting performance SLAs. Storage Foundation improves the overall performance of database environments through the use of Quick I/O (QIO), Concurrent I/O (CIO), Oracle Disk Manager (ODM) and Cached Oracle Disk Manager (CODM) database accelerators.. The net benefit is database performance equal to raw disk partitions, but with the manageability benefits of a file system.

Local and remote data protection

Storage Foundation provides data protection with copy service options that address both local and remote replication needs. With the FlashSnap™ feature, administrators can create point-in-time copies with minimal impact to applications and users. Point-in-time copies can be accessed from the same server or easily be imported to another host, enabling users to leverage storage hardware economics by taking advantage of the heterogeneous, tiered storage support offered by Storage Foundation. These copies can either be full or space-optimized volume snapshots or database clones, which can quickly be re-synched. This allows users to perform resource-intensive processes such as backups, testing, decision support, and reporting off-host.

For mission-critical applications that require remote recovery sites, Veritas™ Volume Replicator from Symantec enables efficient replication of data over IP networks. This gives organizations an extremely flexible, high-performance alternative to traditional array-based replication architectures. Organizations can combine virtually any storage devices on any major operating system, providing a

consistent, easy-to-manage high availability/disaster recovery solution throughout the data center.

Multi-vendor hardware infrastructure

Storage Foundation provides comprehensive platform support for heterogeneous server and storage infrastructure with no hardware, database, or application agenda. This provides enterprises with the freedom to choose industry-leading functionality across platforms without getting locked into proprietary solutions.

Sized for your needs

Choose the feature set that is appropriate for you:

- **Storage Foundation Basic**—Intended for smaller systems, Storage Foundation Basic is available at no cost and provides the same robust features of Storage Foundation Standard, but is designed for system workloads that do not exceed four volumes and/or four file systems, and/or two processors/sockets in a single physical system.

- **Storage Foundation Standard**—Intended for medium size systems and all workloads, Storage Foundation Standard offers File System and Volume Manager capabilities with no limitations and includes database accelerators.

- **Storage Foundation Enterprise**—Intended for enterprise environments, Storage Foundation Enterprise offers full functionality, including FlashSnap, and storage checkpoints, SmartTier and Thin Provisioning optimization.

Other product highlights

- **Simpler, leaner and more resilient**[6] —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

---

6. New functionality available in Veritas Storage Foundation 5.1.

Confidence in a connected world. ✓Symantec.

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
- **Automated performance tuning**—Data is automatically written efficiently to the underlying storage hardware thereby improving performance
- **Hot relocation**—Automatically migrates data from failing disks to healthy disks

Optimized for your environment

Storage Foundation is available in a number of versions, enabling IT organizations to utilize the version that is right for their operating environment:

- **Veritas Storage Foundation HA**—All the features of Storage Foundation plus Veritas™ Cluster Server from Symantec. This version combines the storage availability and manageability of Storage Foundation with the server and application availability of Veritas Cluster Server.
- **Veritas Storage Foundation Cluster File System**—All the features of Storage Foundation plus a cluster file system and cluster volume manager for concurrent data access from multiple servers.
- **Veritas Storage Foundation for Oracle® RAC**—All the features of Storage Foundation Cluster File System with additional features to support Oracle RAC environments.
- **Veritas Storage Foundation for Sybase® ASE CE**—All the features of Storage Foundation Cluster File System with additional features to support Sybase ASE CE environments.
- **Veritas Storage Foundation for Windows**—Provides easy-to-use online storage management specifically

designed for mission-critical, enterprise Windows environments.

Supported operating systems

- Oracle® Solaris™
- HP-UX®
- IBM® AIX®
- Red Hat® Linux
- SUSE® Linux
- Oracle® Enterprise Linux
- Microsoft Windows®

More Information

Visit our website

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.
For specific country offices and contact numbers, please visit our website.

Symantec World Headquarters
350 Ellis St.

Mountain View, CA 94043 USA

+1 (650) 527 8000

1 (800) 721 3934

www.symantec.com

20028514-2 11/10

Confidence in a connected world. ✔Symantec.