

# Veritas Storage Foundation™ for Databases by Symantec

Manageability, availability, and superior performance  
for DB2®, Oracle®, and Sybase databases



## Highlights

- **Improve database storage administration** – Offers manageability benefits of a file system and automation of repetitive tasks
- **Reduce database storage costs** – Assign data to multiple tiers of storage based on predefined policies
- **Facilitate off-host processing** – Employ easy-to-use database clones to enable data analysis and backups
- **Increase efficiency of database backup and recovery** – Protect the database from logical errors by providing point-in-time copies
- **Identify and remove I/O bottlenecks** – Using storage mapping, map database objects down the storage hierarchy to the physical disks
- **Enhance database performance** – Utilize database accelerators and multiple physical paths to disks, for storage devices that support them

> Enterprises are required to manage a rapidly growing number of database-dependent applications and mission-critical database environments, often with stringent service-level agreements and reduced operational budgets. The requirement for information availability has created an operational imperative to shrink database backup windows, recover more quickly from outages, and move non-critical, yet resource-intensive, workloads to secondary storage—without increasing management complexity. Veritas Storage Foundation for Databases addresses these operational challenges and lowers the total cost of ownership through consistent cross-platform management interfaces that can reduce both training requirements and human error.

Veritas Storage Foundation for Databases enables powerful manageability, optimum performance, and continuous access to DB2, Oracle,<sup>1</sup> and Sybase databases. Veritas Storage Foundation for Databases is built upon Veritas Storage Foundation, which combines the industry's leading volume management and file system technologies. In addition, database-specific enhancements such as I/O accelerators, database recovery tools, support for tiered storage, and extensive online administrative capabilities provide the breadth and depth to manage large, mission-critical database environments.

### Improve database storage administration

Veritas Storage Foundation for Databases improves manageability by automating many of the manual tasks typically associated with database storage management, thereby reducing administrative workload as well as human and operational errors. Storage Foundation for Databases gives administrators the flexibility to manage the volumes and file systems of DB2, Oracle, or Sybase using the graphical Veritas Enterprise Administrator user interface (or customers can use a command line interface). Veritas Enterprise Administrator manages the Veritas Storage Foundation family of products and all supported storage devices across all operating systems. All storage

management activities such as RAID reconfiguration, volume and file system resizing, and snapshots can all be performed online and across any operating system.

### Reduce database storage costs

As the size of a relational database grows, so does the size of the inactive data. The result: a steep rise in storage costs and an abysmal drop in database performance. The Dynamic Storage Tiering feature of Storage Foundation for Databases alleviates this issue by providing a policy manager that administrators can use to move out-of-date data files to less expensive storage devices without changing the way the database accesses those files. Policies can be created that will move files based on date created, last time accessed, owner, size, or name. These files will be dynamically moved without having to take the database offline. More importantly, the move is completely transparent to the users and applications that own the files—they don't need to know the files have moved. Decision support systems are a great example wherein administrators can use Dynamic Storage Tiering to store frequently used data in tier 1 storage while moving the infrequently accessed data to tier 2 storage. A policy can be created to make this a rolling update, so that data can be automatically migrated from tier 1 to tier 2 storage.

### Facilitate off-host processing

Relational databases provide a single view of the data to all applications referencing it. While this improves the quality of information available to users and managers dramatically, it constrains an enterprise's ability to use the same data for data analysis or backup. These processes cannot be carried out while a database is being updated by business applications, introducing the need for point-in-time copies. The Storage Foundation Database FlashSnap™ feature enables administrators to set up reusable point-in-time copy policies, verify storage resources, and create full online database clones, space-optimized volume snapshots, and space-saving file system checkpoints without impacting production applications and users. Database point-in-time copies can be migrated to a secondary server and used for resource-intensive processes such as backups, decision support, reporting, and testing independent of the storage hardware being used.

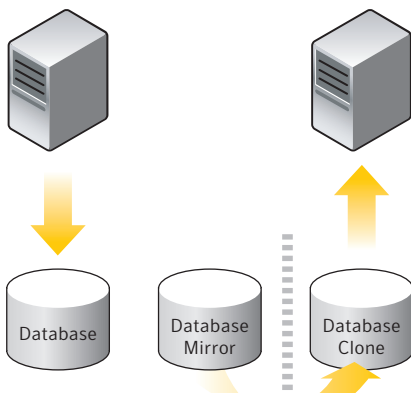


Figure 1. Migrate database point-in-time copies to secondary servers

### Increase efficiency of database backup and recovery

Veritas Storage Foundation for Databases, with its Storage Checkpoint technology, enables efficient backup and recovery of databases. A Storage Checkpoint is an efficient disk and I/O snapshot for creating a “clone” of a currently mounted file system (the primary file system). Unlike a full file system copy that uses separate disk space, all Storage Checkpoints share the same free space pool where the primary file system resides, greatly reducing the need for excess storage. File corruption errors, such as a faulty patch to a binary file, are simply and speedily recovered by restoring the original file's checkpointed contents. It only takes a split second to corrupt a database; however, recovering this table from yesterday's backup can be a very time consuming and costly process. The Storage Checkpoint Rollback feature enables the administrator to go back in time, to the specific point when the fault occurred, enabling database recovery in minutes rather than hours.

### Identify and remove performance bottlenecks

The challenge with maximizing database performance is having visibility from the data file to the storage spindle. However, with Veritas Storage Foundation for Databases and its storage mapping feature, organizations have that visibility. When organizations have detailed database mapping information, a detailed understanding of the storage hierarchy, and knowledge of where each data file resides, performance bottlenecks may be eliminated. Armed with this information, IT organizations can minimize I/O performance bottlenecks by dynamically moving data files to different logical units on different physical spindles, or to another array all together. The performance tuning capabilities of Storage Foundation for Databases gives organizations the flexibility to be as sophisticated as they choose, or let Storage Foundation manage it with hot relocation, a feature that automatically detects and replaces failed disks using a free disk pool.

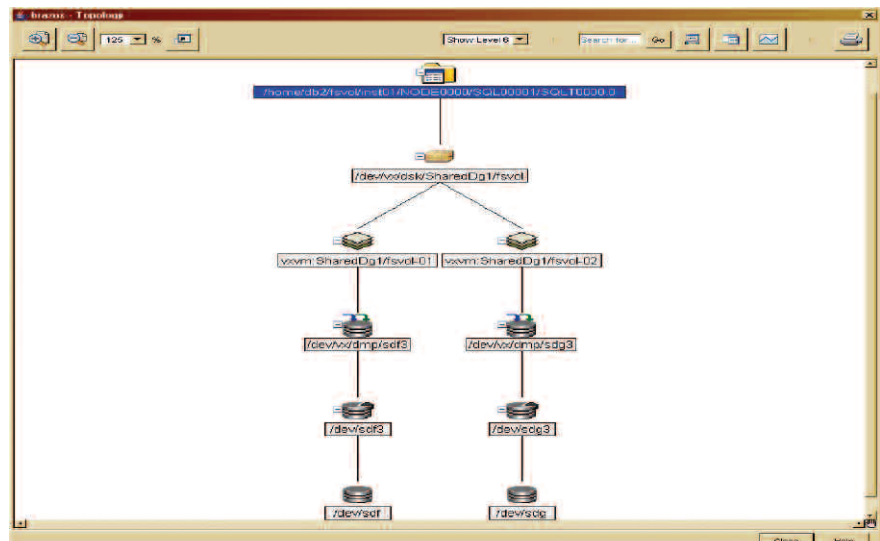


Figure 2. Storage mapping provides visibility from the data file to the storage spindle.

### Enhance database performance

The major concern in any consolidation effort is maintaining respectable performance or meeting performance SLAs. Veritas Storage Foundation for Databases improves the overall performance of database environments in a variety of ways. Quick I/O (QIO), Concurrent I/O (CIO), and Oracle Disk Manager (ODM) are database accelerator technologies that enable database performance equal to raw disk partitions, but with the manageability benefits of a file system. CIO and ODM are enhancements specifically for DB2 and Oracle environments, respectively. They both deliver the same performance benefits as QIO, but also provide tight database integration for easier manageability. With the Dynamic Multi-pathing feature of Storage Foundation for Databases, performance is maximized by load-balancing I/O activity across all available paths from server to array. Dynamic Multi-pathing supports all major hardware RAID vendors, hence there is no need for third-party multi-pathing software, reducing the total cost of ownership.

### Other Product Highlights

- VxDBA – Includes a number of utilities for DBAs to perform database storage administration tasks
- Space Capacity Planning – Simulates various Storage Checkpoint creation and retention models in a production environment
- User Interface – Provides intuitive Web, Java,™ or command line interface options for local or remote management
- Hot Relocation – Automatically detects a failed disk and replaces the disk from the available free disk pool
- Veritas NetBackup Advanced Client Support – Minimizes database backup windows and amount of backup media required
- Dynamic Multi-pathing – Provides I/O load balancing and availability throughout the SAN

### Available versions

- Storage Foundation for Databases Standard – Intended for medium-size systems and all workloads, Storage Foundation Standard includes all features except Database FlashSnap and Dynamic Storage Tiering
- Storage Foundation for Databases Enterprise – Intended for enterprise environments, Storage Foundation Enterprise offers full functionality including storage mapping, Database FlashSnap, Dynamic Storage Tiering, and Storage Checkpoints

## Veritas Storage Foundation: Management Editions

	Storage Foundation		Storage Foundation for Databases	
	Standard	Enterprise	Standard	Enterprise
Storage virtualization	✓	✓	✓	✓
Centralized management	✓	✓	✓	✓
Portable data containers	✓	✓	✓	✓
Dynamic multi-pathing	✓	✓	✓	✓
Dynamic storage tiering	–	✓	–	✓
FlashSnap	–	✓	–	✓
Quick I/O, Concurrent I/O, ODM	–	–	✓	✓
Database FlashSnap	–	–	–	✓
Storage mapping	–	–	–	✓
Storage rollback	–	–	–	✓
Block level incremental backup	–	–	–	✓

## Supported operating systems

### Storage Foundation for Oracle

- IBM® AIX®
- HP-UX
- Sun™ Solaris™
- Linux (Red Hat,® SuSE)

### Storage Foundation for DB2

- IBM AIX
- Sun Solaris
- Linux (Red Hat, SUSE)

### Storage Foundation for Sybase

- Sun Solaris

#### Learn More

For more details contact your local Sun representative or visit [sun.com/storagefoundation](http://sun.com/storagefoundation)