



Unleashing the Potential of Disk-Based Data Protection with Symantec and NetApp

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Executive Overview

NetApp and Symantec have teamed to help organizations unleash the potential of disk-based data protection to protect, access, and recover any data, anytime, anywhere.

Traditional data protection has been overwhelmed by explosive data growth and expanding data recovery requirements. Today's enterprises demand a scalable backup and recovery solution to reliably and rapidly restore business-critical data. NetApp and Symantec are the first to solve these problems by deeply integrating and consolidating disk-based data protection for both NetApp™ storage systems and heterogeneous open system server environments.

By combining Symantec NetBackup software's advanced disk-based data protection technology with NetApp NearStore® storage systems and SnapVault®, SnapRestore®, and Snapshot™ software, organizations can transcend the limitations of traditional backup and recovery practices to take advantage of the following benefits:

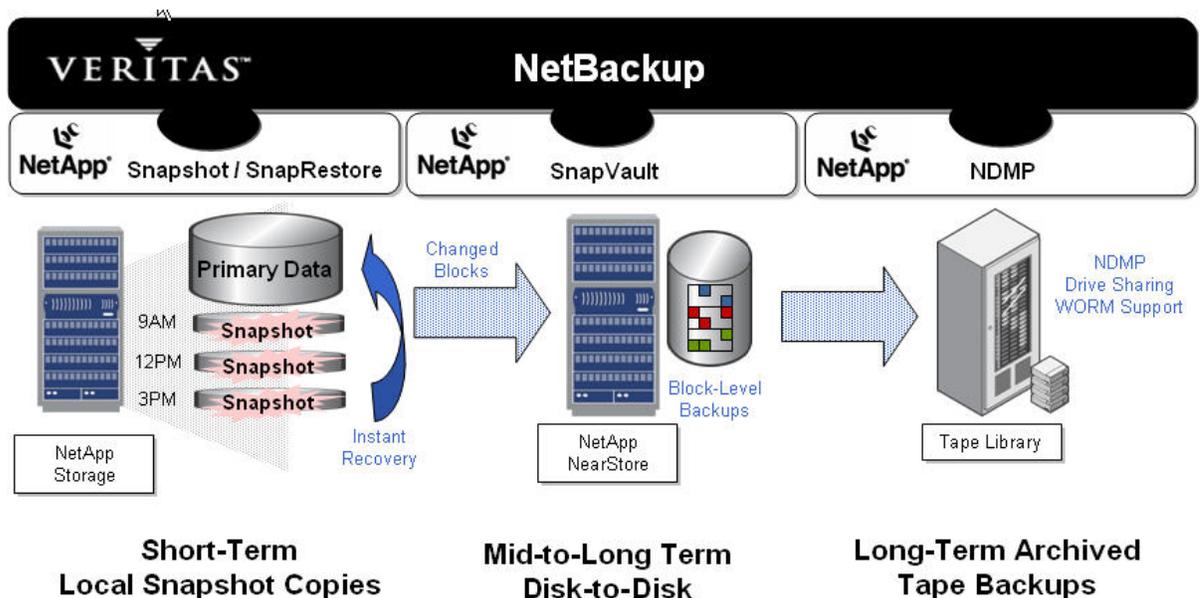
Data Management: Reduce media management complexities, while enabling flexible scheduling and configurations. Proactively manage disk capacity with high-low thresholds.

Data Availability: Online, always available storage. Demanding operations no longer have to wait in line for resources. Backups, restores, and duplications can be performed simultaneously. Advanced availability features include the ability to import disk images and failover between storage groups and media servers.

Performance: Leverage random access disk capabilities and granular tuning parameters, while eliminating mounting and positioning delays. Enable disk-based Snapshot copies for instant, low-impact protection.

Complete Data Protection

Organizations can simplify their data protection strategy by managing all data protection stages from a single interface, including Snapshot management for short-term protection and instant recovery, disk-to-disk backups for near-term protection, and enhanced NDMP tape backups for long-term storage.



Short-Term Data Protection—NetBackup Snapshot Management Integration

NetBackup software integrates with NetApp Snapshot and SnapRestore software to enable low-impact backups, rapid restores of individual files, and the ability to roll back an entire NetApp volume or file system to a specific point in time. NetApp Snapshot management integration commenced with the introduction of NetBackup Enterprise Server 5.1 software. The NetBackup Advanced Client option supports the NDMP V4 Snapshot Management Extension, enabling control and management of NetApp Snapshot copies.

NetBackup software presents individual client views of the space-optimized, block-level Snapshot copies that are stored locally on the NetApp storage system. Each Snapshot copy is a full backup, with the possibility of hundreds of Snapshot copies (full backups) kept online for verifiable, reliable backups and immediate access and quick recovery. NetBackup simplifies and consolidates the management of NetApp Snapshot copies across multiple storage systems into a single, integrated data protection solution. Administrators no longer have to manually configure NetApp Snapshot copies outside of NetBackup software.

Managing NetApp Snapshot Copies

The NetApp WAFL® file system supports Snapshot, a Data ONTAP™ feature that provides the ability to maintain online, read-only versions of each file system. Data ONTAP versions 6.4 and higher support hundreds of Snapshot copies per volume.

Symantec NetBackup Enterprise Server 5.1 software and higher versions for Solaris™ and Microsoft® Windows® configure, schedule, and catalog NetApp WAFL file system Snapshot copies. The NetBackup Advanced Client option provides an intuitive GUI facilitating scheduled, policy-based Snapshot copy creation and retention. Using the NetBackup Backup, Archive, and Restore (BAR) GUI, administrators or users can recover files, directories, or entire file systems from WAFL file system Snapshot copies, allowing service-level agreements to be met for short-term data protection strategies.

WAFL file system Snapshot copies consist of a copy of the set of pointers from the active file system. Because the Snapshot copy creation process does not copy file system data blocks, the entire process executes almost instantaneously. Snapshot copies typically incur a small disk space premium, and are maintained as pointers to disk blocks containing data. As the active file system changes, Snapshot copies continue to point to deleted or changed disk blocks, holding these blocks from the file system's free space.

Instant Recovery—NetBackup SnapRestore Integration

The NetApp SnapRestore option leverages the Snapshot feature of Data ONTAP software by restoring a file or entire file system to an earlier preserved state. It can be used to recover a single file or an entire volume to a defined point in time.

The NetBackup software contains integrated instant recovery support for SnapRestore via the BAR GUI. Point-in-time rollback of a single file or an entire WAFL file system volume is accomplished easily and quickly.

Online Oracle® Database Protection

The NetBackup Advanced client also supports WAFL file system Snapshot management integration for Solaris clients running Oracle databases on NetApp storage systems. The solution includes RMAN proxy copy functionality, as well as integrated support for the NetBackup for Oracle agent backup and recovery wizards.

Supported Backup and Restore Types

Operation Type	Supported Functionality
Backup	WAFL file system Snapshot copies
Restore	Single file Subdirectory Full volume (Oracle)
SnapRestore	Single file Full volume (Oracle)

Near-Term Data Protection—NetBackup SnapVault Management Integration

NetApp SnapVault management is integrated with Symantec NetBackup Enterprise Server 6.0 software for Solaris and Windows. The NetBackup Advanced Client option supports the NDMP V4 SnapVault Management extension, enabling configuration and control of SnapVault data movement and cataloging of the backups.

Managing NetApp SnapVault Disk-Based Backup and Recovery

The integration of Symantec NetBackup 6.0 software with SnapVault technology provides online disk-based backup and recovery for NetApp storage systems. SnapVault software leverages WAFL file system Snapshot copies to transfer data from one NetApp storage system (SnapVault primary) to another (SnapVault secondary), which is a NearStore storage system. Since only the changed blocks are transferred from the primary to the secondary, substantial performance improvements can be realized and the amount of disk storage consumed dramatically reduced. Even though few data blocks are transferred, each operation with Snapshot and SnapVault is a full backup, with the possibility of hundreds of these kept online on the secondary storage system for verifiable, reliable backups and immediate access and quick recovery.

Symantec NetBackup Enterprise Server 6.0 software, combined with the NetBackup Advanced Client option, provides fully integrated support for SnapVault. The NetBackup Administration Console is used to configure, control, and manage SnapVault disk-to-disk backup and recovery operations:

- Creation and management of SnapVault relationships between SnapVault primary and SnapVault secondary storage platforms
- Scheduling of Snapshot copies
- Scheduling of SnapVault transfers
- User-directed browsing and restoring
- Support for individual file, subdirectory, and entire quota tree recoveries
- Oracle Database backup and recovery

With SnapVault software, intelligent data movement reduces network traffic and the impact on production systems. SnapVault software makes a baseline transfer of the data (comparable to a full backup for tape backups). When updates to data occur on a SnapVault primary, only new or changed data blocks are transferred to the SnapVault secondary.

Supported Backup and Restore Types

Operation Type	Supported Functionality
Backup	WAFL file system Snapshot copies SnapVault transfers
Restore	Single file Subdirectory Quota tree (Oracle)

Long-Term Data Protection—NDMP Tape Backup and Restore

Organizations can leverage NetBackup 6.0 software’s Network Data Management Protocol (NDMP) support to complete their data protection lifecycle, and enhance their backups of NetApp storage systems to long-term tape storage. Combining NetBackup 6.0 software’s ability to dynamically share tape drives in a SAN with NetBackup software’s local, three-way, and remote NDMP configurations, offers the flexibility to leverage tape resources and simplify management operations.

Additional NetBackup 6.0 for NDMP enhancements include:

- Remote NDMP support for AIX, HP-UX, and Linux® platforms;
Solaris and Windows platforms were already supported
- Support for WORM tape
- NDMP backups greater than 1TB

Dynamic Tape Drive Sharing and Multipath Support

NetBackup 6.0 software adds support for tape drive sharing among NDMP servers. This includes tape drive sharing among NDMP servers and NetBackup media servers. Multipath support allows multiple paths to a tape drive, providing redundancy and enabling clustering.

Supported Backup and Restore Types

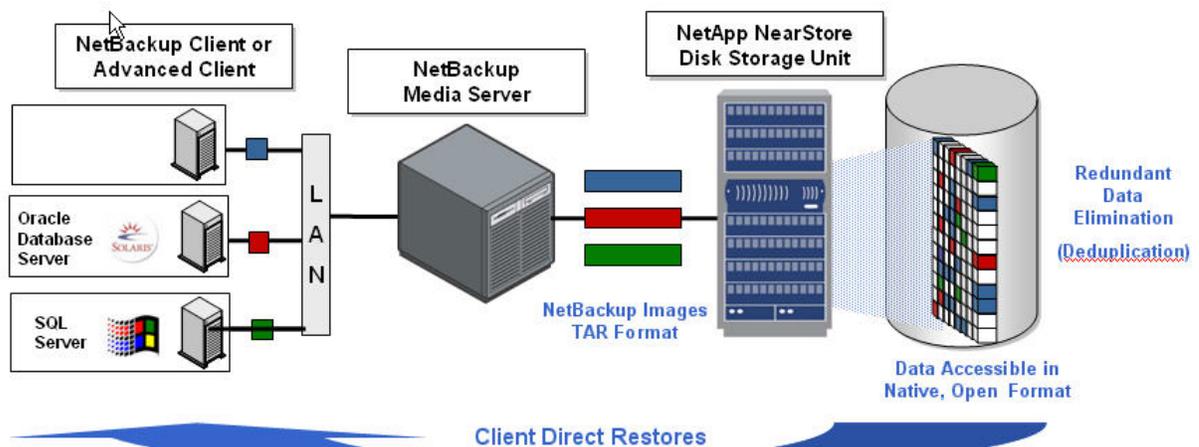
Operation Type	Supported Functionality
Backup	NDMP backups
Restore	Single file Subdirectory Quota tree Volume

Integrated Disk-Based Data Protection for Open Systems

Organizations can now implement an easy-to-deploy disk-based data protection solution that helps reduce tape media management and enhances backup and restore performance for all their open system servers.

NearStore Disk Storage Unit

With the NetBackup 6.0 release, Symantec introduces support for the NetApp NearStore Disk Storage Unit as an optimized storage unit based on the NetApp NearStore storage system. The NearStore Disk Storage Unit leverages the capabilities of the NearStore storage system to provide optimized disk-based backup solutions for open systems.



Leveraging a NearStore storage system with NetBackup software provides administrators innovations in efficient disk space utilization and data transfer performance:

Increased data transfer rates are possible between a NetBackup media server and a NearStore Storage Unit when compared to a NetBackup media server and a traditional disk storage unit that is NFS or CIFS mounted. The performance increase results from the use of a modified network protocol, where synchronous data transfers can occur without delays associated with interlocked packet acknowledgment.

File-based backups written to a NearStore Storage Unit will utilize less disk space when compared to traditional disk storage units. After an initial client backup is performed, the NetApp WAFL file system will save only changed blocks when subsequent backups are performed for the same client. The amount of disk space that is saved by using data deduplication technology will vary depending on client-data-change rates.

Client direct restores from NetApp NearStore provide rapid, user-driven restores via the native WAFL format in which the backup data is stored.

Disk staging, synthetic backups, and checkpoint restart can also be used with the NearStore Disk Storage Unit.

Additional NetBackup 6.0 software disk storage unit enhancements include the following:

- Disk backup images can be imported

- Disk storage unit full conditions are handled intelligently when the disk storage unit is part of a storage unit group and include prioritized, least recently selected, or failover selection methods.

- High watermark settings can be used to define the point where the disk storage unit is considered full.

- The NetBackup GUI will display total disk storage unit capacity, as well as free space.

- Increased maximum fragment size of ½TB reduces overhead and housecleaning, resulting in improved performance.

Disk Staging

Symantec NetBackup disk staging leverages high-performance NetApp NearStore disk attached to a NetBackup Media Server as a cache prior to storing backup data on long-term storage. Automated disk staging helps reap the benefits of both tape and disk media while providing investment protection.

Disk staging gives the NetBackup administrator additional flexibility when configuring their backup and recovery strategy. Disk staging can facilitate faster backups and restores since there is often no tape latency, and the non-multiplexed backup images generated through staging can be used for faster recovery from tape.

Additional enhancements provided by disk staging include the following:

- Automated backup and relocation policies

- Intelligent resource selection for rapid restores

- Support for multiple tape drives when duplicating backup images from staging

- Resources required for duplication of images initially written to disk are utilized based on user-configurable priority

- Support for storage unit groups when staging from disk to tape

- Staging performance enhancements when processing small backup images to tape

- Throttling the maximum number of concurrent duplication operations when staging from disk to tape

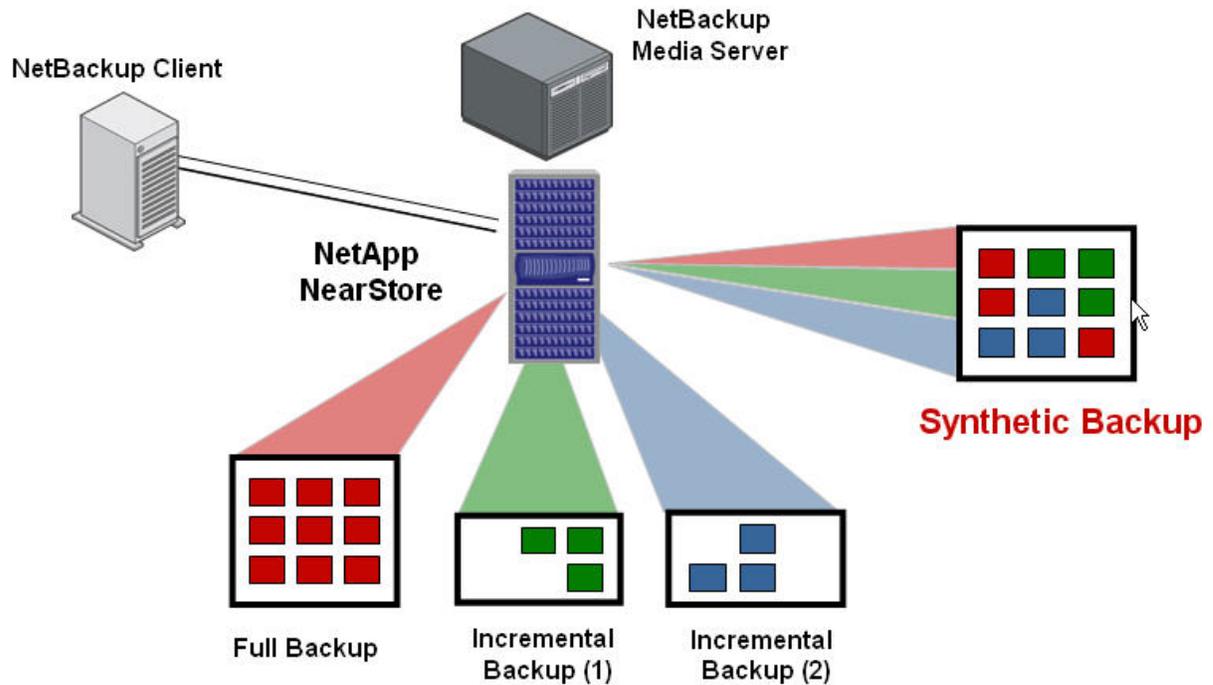
- High and low watermark settings that enhance the ability to tune duplicated image expiration

- Support for off-host duplication without multiplexing

Synthetic Backup

Synthetic backups are backups that have been assembled from a previous full backup, and subsequent differential backups or a cumulative incremental backup. Clients can use synthesized backups to restore files and directories in the same way that a client restores from a traditional backup. Synthetic backups are assembled on the NetBackup media server without incurring client or network impact. Synthetic full backups are an accurate representation of the clients' file system at the time the most recent incremental backup was run.

Synthetic backups have been enhanced with the NetBackup 6.0 release to allow multiple synthetic backups jobs to run concurrently in conjunction with disk storage units. NetApp NearStore Disk Storage Units can also take advantage of this enhancement.



Summary

NetApp and Symantec provide comprehensive short-term, near-term, and long-term data protection solutions. Integrated support for NDMP V4 extensions enabling Snapshot and SnapVault management combined with dynamic tape drive sharing provide a complete solution.

Disk-based backup capabilities of open system storage have been enhanced with the NetApp NearStore storage systems. Customers with NetBackup 5.0 clients or newer, NetBackup 6.0 Media Servers, NetApp NearStore secondary storage and SnapVault software will enjoy enterprise data protection that integrates industry-leading backup management and disk storage. The solution improves backup performance, minimizes media requirements, simplifies recoveries, and enables end-user restores while seamlessly moving backup data across tiers of storage.



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