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Backup Express and Network Appliance:
Integrated Solutions for Instant Availability

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The Next Generation of OSSV:
A New Standard in OSSV Performance

Introduction/Background

Syncsort Incorporated has developed the next generation of OSSV (Open System SnapVault) agents, using unique technology to create a new standard in OSSV performance. Together, Syncsort and NetApp provide the fastest seamlessly-integrated solutions for enterprise-wide disk-based data protection, using Backup Express and NearStore.

By using Backup Express, an enterprise-level data protection application, in combination with NearStore storage systems, end users get the best of both worlds. They can reap the benefits of disk-based protection, while still exercising the ability to retain data on alternate media for long-term archival, disaster recovery or regulatory compliance.

"Backup Express and Network Appliance work together to fulfill customers' needs for proven, trustworthy data storage and protection solutions," explains Rich Boberg, Sr. Director Technology Partnering at Network Appliance. "We understand that customers rely on dependable data protection to safeguard their critical business information and continue their business operations."

The combination of Backup Express and NearStore creates a unique solution that provides flexibility and scalability to meet the needs of to-day's enterprise environments. Data growth, decreased tolerance for downtime and shrinking storage budgets and staffing are just a few of the challenges that this solution addresses.

Flexibility to increase the number of snapshots in a time period increases the security of the data, and optimizes existing expenditures. The ability to use newer disk-based protection in combination with previous tape protection and off-site archive options allows seamless, end-to-end data protection.

The Backup Express and NetApp combined solution supports a number of crucial backup and restore features. Several different restore options are possible, including "True Image Restore (TIR)" or selective restores (Extract or Selective restores) using both full (level 0) dump images as well as differential or cumulative (levels 1-9) incremental dump images to recover files

About NearStore

NearStore® systems from Network Appliance offer cost-effective, fast-access storage for online backup and archiving. NearStore inserts economical and simple-to-use disk-based storage between application storage and tape libraries, in a two-stage backup configuration. Nearline storage from Network Appliance is the ideal solution for workloads that require quicker random access compared with offline storage, but do not require the continuous, high-volume activity provided by primary storage.

The NetApp NearStore R200 system meets storage challenges by providing near-primary storage performance at near-tape storage costs. A disk-based, secondary storage device for enterprise applications, NearStore perfectly complements and dramatically improves existing tape backup, archiving, and data protection schemes.

A superior archiving solution, NearStore provides economical storage and rapid disk-based access to reference data to meet business and legal requirements. Combined with SnapVault™ and SnapMirror™ software, in addition to the snapshot technology in its Data ONTAP™ operating system, NearStore represents a comprehensive, cost-effective, highly reliable data protection solution.

Unique Benefits of Backup Express SnapVault Support:

- Ground-breaking speed; a new standard in SnapVault performance
- iSCSI target attach for-instant availability
- Unassisted end-user file recovery
- Application-aware agents for popular applications
- Selective restore of files, directories or application objects
- Bare metal restoration
- Seamless management of image snapshot, SnapVault and conventional data protection
- Single, centralized, scalable catalog

at the destination site. True Image Restore will rebuild an entire file system or subtree back to the exact state of the backup if base incremental backups are restored in order. "Direct Access Restore (DAR)" is supported with flexible user-defined File History Processing (FHP), allowing users to distribute File History Processing loads between the master server or NDMP agent node.

The solution supports NDMP v2, v3, v4 and Data ONTAP v5.3.4 and higher, and also allows NDMP and non-NDMP data to reside on the same tape drive. The Backup Express SAN Resource Sharing supports SAN sharing between NDMP and non-NDMP hosts through Dynamic Drive Sharing. Additionally, several different backup configurations provide for maximum flexibility: three-way backup from filer to filer/NearStore, filer to server backup and server to filer/NearStore backup, in addition to

Snapmirror to tape. The solution also supports a wide variety of high speed devices (S-AIT, LTO-2, SDLT) including NDMP-capable tape libraries. Auto-configuration of devices attached to a filer is also supported.

Inventing the Next Generation

With next-generation Backup Express OSSV, data recovery is near-instant for both applications and data volumes. Backup Express OSSV agents integrate high-performance Syncsort technology and NetApp's NearStore features by transferring open systems data as often as desired to the NearStore device.

Syncsort's technology provides the ability to back up at nearly raw disk speed while retaining the ability to restore selectively with extremely low application server resource impact/footprint.

This technique is physical backup and logical restore that will out-

perform existing industry products for source volumes with multitudes of small-to-medium files (see Figure 1 below). This is supplemented by following the "Incrementals Forever" philosophy, which supplies the facility to save only changed information and still allow for full point-in-time restores. Block level incremental backup is extremely fast with low CPU and memory footprint on the protected server. All backup processes are made error-proof via Backup Express's "Checkpoint Re-start Support".

Backup Express Develops Multi-platform Image-based OSSV Agents

Backup Express's OSSV agents provide proven speed and performance through the ability to back up at close to raw disk speeds while retaining the ability to restore selectively. The advantage of the next-generation Backup Express technology is based on exclusive image and snapshot technique.

Figure 1
NetApp vs. Syncsort OSSV Agent
Elapsed Time Comparison
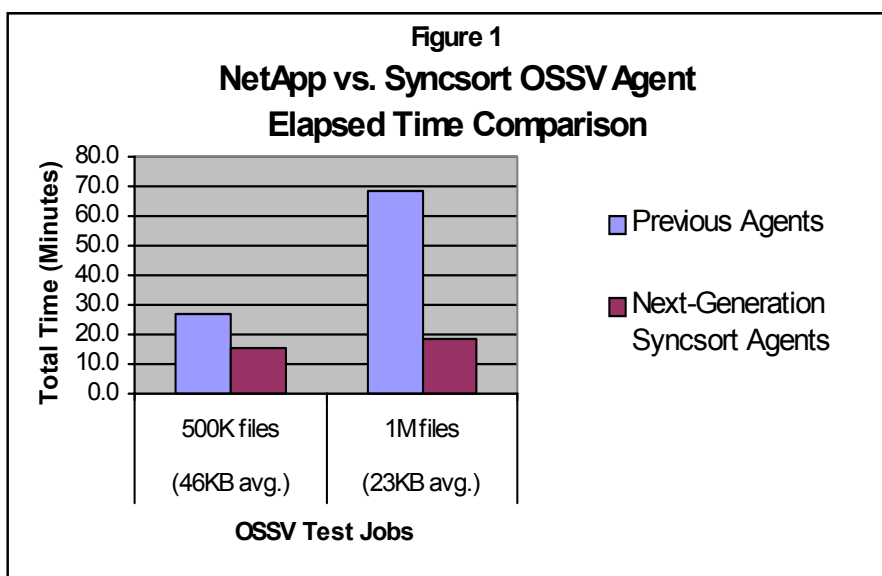
Source: Joint Syncsort/NetApp Benchmark tests

The Backup Express OSSV also provides **near-instant availability** for end users. Leveraging NearStore's iSCSI target capabilities, point-in-time copies of the source volume may be attached as a remote disk to end-user systems. This feature enables end-users to restore files (subject to permissions) without administrator assistance. This is only one example of the Backup Express and NearStore combination providing a unique, advanced capability.

Backup Express Develops Image-based Application-aware OSSV Agents

The Backup Express OSSV Image Application Agents provide all the same benefits as the OSSV file agents do, listed in the previous section. In addition, they support the most popular applications (major databases, mail, collaboration, workflow, etc.). They use snapshots to keep applications highly available, which requires that they possess in-depth knowledge of the specific application. Backup Express OSSV snapshots must

be coordinated with application logic and process flow. Since transactional consistency is paramount and online applications must be protected in a non-disruptive manner, the OSSV processing must be transparent to application users.

In-depth integration with applications provides for logical restores: e.g., fast, block-oriented file level backup with logical restores of databases and message stores.

The Backup Express Image OSSV Application Agents build on Syncsort's technology to enable block-level backup methods that provide the point-in-time copies faster than previously possible. Since the application data and state are nearlined, when using Backup Express OSSV Application Agents, application recovery is near-instant. Understanding the logical application objects creates a hot base for the application, which allows for a near-instant recovery to a transactionally consistent point-in-time.

Groundbreaking technology from Backup Express also allows the application to quickly recover to a standby server. This is accomplished by attaching the disks on NearStore to the standby server and automatically recreating the physical relationships that the application logically expects. This innovation establishes the Backup Express and NearStore combination as a unique application failover solution to meet high-availability, disaster recovery or data-shipping needs.

Backup Express Provides Bare Metal Restoration for NetApp NearStore

With Backup Express and NearStore, users can benefit from a bare metal restoration option for their systems.

This unique agent for NearStore is only available with Backup Express. When a machine experiences catastrophic failure, a new machine with similar hardware may be designated as a replacement. The new machine may be restored to reflect the failed ma-

Figure 2   **Backup Express OSSV Agent Projected Availability**
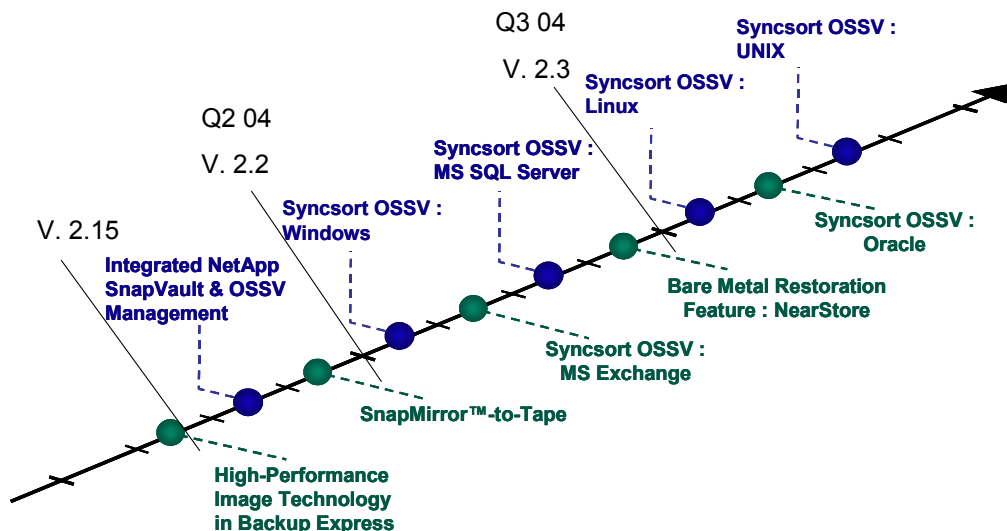
chine at some point in – without the need to install the operating system and applications prior to loading the data. Two options for this type of restore are available: Instantaneous, in which volumes are attached, not copied, and Comprehensive, in which all volumes are fully restored to a specific point-in-time.

Additional Backup Express Advantages:

Backup Express provides additional value through seamless integration of Image Snapshot, SnapVault and conventional backup and restore management.

Backup Express's Advanced Protection Manager presents the NearStore solutions seamlessly

to the user. The state-of-the-art interface allows users to manage all data protection needs from one central console. All types of jobs can be managed from the same schedule. Recovering data is seamless and automated, regardless of whether it resides on disk or tape or is archived, migrated or backed up. Underlying technology remains transparent, and allows the user to consistently manage NearStore backups in the same manner as conventional backup. This eliminates the user's need to learn a new method and thus the associated learning curve.

NetApp's SnapLock and Backup Express combined enable superior data protection options, including allowing regulatory compliance for data retention. Layering SnapLock,

high-performance, nonrewritable, nonerasable disk storage technology, with Backup Express provides effective, low cost disk-based data permanence for extended retention of regulated data.

With Backup Express flexibility, user-defined policies determine when snapshots are taken and what archiving techniques are used. All types of snapshots are tracked in the same centralized, scalable catalog as conventional backups. This flexibility allows the design of an optimized environment as users can leverage primary storage, lower-cost disks and traditional backup tapes to best meet their needs.
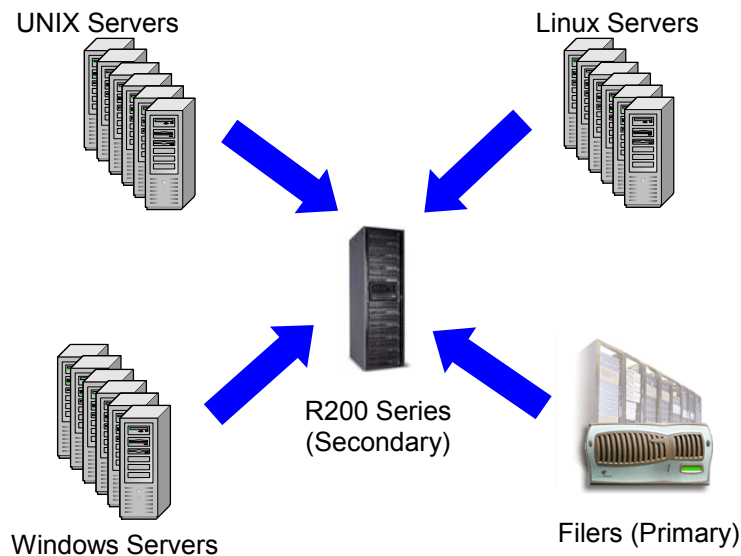

Figure 3
Backup Express and NearStore Configuration

For more than 30 years, Syncsort has built a reputation for superior product performance and reliable technical support. Syncsort's Backup Express is a major component in the company's success, as a high-performance data protection with unique I/O technology. Future generations of the product will only increase the performance benefits and exceptional edge that the solution provides, such as unique support for Network Appliance systems. With further integration with NearStore, SnapVault, and other snapshot technology, Backup Express will continue to provide superior benefit to NetApp customers.

Figure 4
Projected Backup Express OSSV Agent Feature Availability

Backup Express Feature Availability	2.1.5.d	(Q2 04) 2.2	(Q3 04) 2.3
File History, Direct Access Restore (DAR) and flexible user-defined processing	●	●	●
NDMP v2, v3, v4	●	●	●
Data ONTAP v5.3.4 and higher	●	●	●
Three-way backup from Filer to NearStore	●	●	●
Filer to Server backup	●	●	●
Server to NearStore backup	●	●	●
True Image	●	●	●
Dynamic Drive sharing between NDMP and non-NDMP hosts	●	●	●
Fast traditional recovery from NearStore (to original or alternate destination)	●	●	●
Block-level, volume-oriented image technology for high-performance conventional backup/recovery	●	●	●
NetApp SnapVault integrated management: ONTAP		●	●
NetApp OSSV Agents / integrated management: UNIX, Windows and Linux		●	●
SnapMirror to Tape		●	●
Syncsort OSSV Agents for Windows			●
Syncsort OSSV for MS Exchange			●
Syncsort OSSV for MS SQL Server			●
Syncsort SnapVault Bare Metal Restoration Facility - Windows			●

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