



NETAPP WHITEPAPER

ACHIEVING ENHANCED BUSINESS CONTINUITY USING BAKBONE NETVAULT[®]: BACKUP AND NETAPP NEARSTORE[®] VTL

Network Appliance, Inc.
October 2006 | WP-7000-1006

Business continuity has emerged as a key IT priority in the modern enterprise. Because data is so critical to every employee, system, and customer relationship, IT must develop, implement, and manage business continuity plans that ensure vital data is continuously protected and readily available under any circumstance.

The purpose of this paper is to provide a framework for the development of a business continuity strategy, to illustrate how a strategy that includes disk-based solutions, such as virtual tape libraries (VTLs), can help achieve business continuity objectives, and to identify best practices for implementing that strategy using disk-to-disk VTL technologies from BakBone and NetApp.

TABLE OF CONTENTS

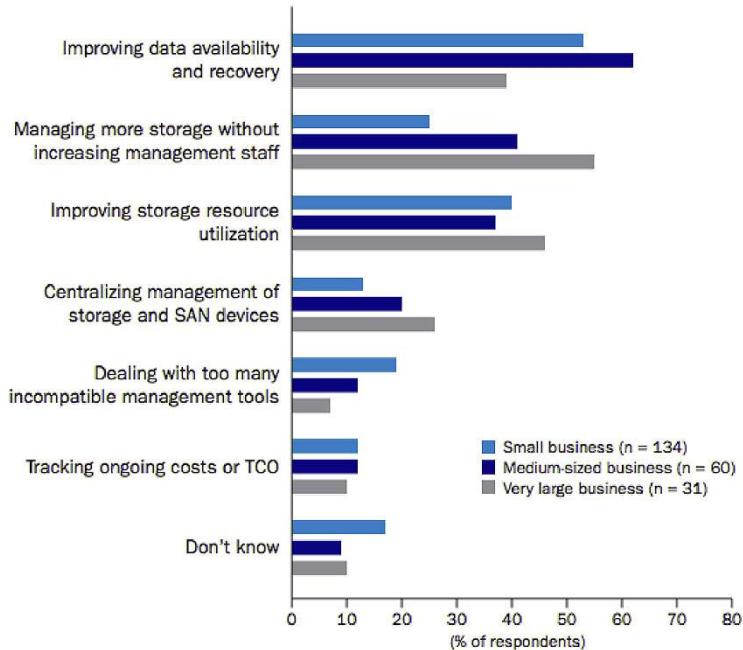
| | |
|---|-----------|
| 1 Introduction..... | 3 |
| 2 Business Continuity: The Time Is Now | 4 |
| 3 Developing a Business Continuity Plan: 10 Steps to Success | 5 |
| 4 Achieving Business Continuity with BakBone NetVault: Backup and NetApp NearStore VTL Solutions | 7 |
| 5 Summary | 13 |

1 INTRODUCTION

In the modern data-driven enterprise, a major data loss can quickly become a financial catastrophe. Without the vital information it needs, the entire business suddenly grinds to a halt, and losses mount with every hour it takes to restore data to the people and processes on which the company's operations depend.

With such risks inherent in the way companies operate, the concept of business continuity has emerged as a key priority for organizations of all sizes. Business continuity is defined as "the ability of an organization to continue to function even after a disastrous event, accomplished through the deployment of redundant hardware and software, the use of fault tolerant systems, as well as a solid backup and recovery strategy."¹ A 2005 IDC/Infoworld "Trends in Storage Survey," in fact, ranked improving data availability and recovery as the top challenge facing IT and storage managers today.

What are the top two challenges facing your company pertaining to storage management?



Base = respondents involved in the acquisition of any type of storage solution
Source: IDC/Infoworld 2005 Trends in Storage Survey

Figure 1 U.S. business top two challenges relating to storage management by company size category.

Business continuity is different than disaster recovery, because it involves a strategic, enterprise-wide approach to maintaining application and data availability in any kind of disruption scenario. Disaster recovery, in contrast, focuses primarily on restoring IT infrastructure and data after a loss due to equipment or site failure. So, an effective business continuity strategy can actually improve financial performance by ensuring uninterrupted workforce productivity and revenue generation.

The development of a successful business continuity strategy requires:

- Conducting a thorough impact analysis of a company's critical data and systems
- Defining of service level agreements (SLAs) and retention policies for all identified data and systems
- Planning for changes in the IT environment
- Creating disk-based backup systems to meet or improve current objectives
- Building backup redundancy through off-site tape and/or WAN backup/replication

This is followed by continual training, testing, and updating to ensure proper implementation and ongoing business continuity protection.

At the implementation level, a business continuity solution has two basic elements: server and storage hardware where data is stored, and software technology that drives and manages data protection processes. The better these two elements work together, the better the solution. Disk-based backup solutions such as virtual tape libraries (VTLs) can be effective tools to help organizations achieve their business continuity objectives. A wide range of products and solution providers is available, offering a variety of price points, features, capabilities, and performance levels.

For many years, NetApp and BakBone have worked together to deliver fully integrated disk- and tape-based backup solutions. Today, the BakBone and NetApp partnership provides comprehensive data protection solutions for some of the world's largest and most demanding IT environments.

With deep partnership experience and a combined product suite that can meet any business continuity requirement, NetApp and BakBone are an ideal choice for companies seeking greater business continuity protection.

2 BUSINESS CONTINUITY: THE TIME IS NOW

Data is the lifeblood of almost every business. Every process, every transaction, every employee depends on the availability of current, accurate information in order to work effectively. But the very nature of this data and the IT environment in which it lives presents increasingly difficult challenges for maintaining both availability and reliability. Databases are growing exponentially and are being populated with both structured and unstructured data (such as video or audio files). The IT environment itself is made up of increasingly heterogeneous elements. Backup windows are shrinking, while demands for faster recovery times are increasing. And, of course, budgets and resources are constantly being constrained, forcing IT to "do more with less."

As if those challenges weren't enough, companies must also cope with the increased need for data availability, both internally and to external vendors, with all its inherent security risks. Greater complexity and network diversity mean more and bigger gaps in data protection and require better disaster recovery planning. To top things off, regulatory compliance is mandating changes in how and for how long data must be kept.

It's safe to assume that virtually every company currently has some sort of disaster recovery plan in place. They can range from simple daily backups that provide restorable data sets in case of a failure to replicating data from various applications across multiple platforms. For many years, this kind of "break/fix" strategy was as far as most companies went. But with the current explosion in both complexity and size of databases and the IT infrastructure needed to support them, such strategies are no longer enough. Maintaining business continuity is the "new frontier," and IT is being tasked with creating and implementing the comprehensive data protection

plans necessary to ensure business continuity under any circumstances. Meeting today's business continuity objectives requires new thinking and new solutions that deliver the highest level of scalability, flexibility, and ease of use.

How important is evolving from disaster recovery to a comprehensive business continuity plan? Consider that *40%* of organizations that suffer major business interruptions due to data loss are out of business *within two years*.²

10 STEPS TO SUCCESS

1. Conduct a business impact analysis.
2. Assess and rank potential losses.
3. Define service level agreements (SLAs).
4. Assess the current IT infrastructure.
5. Identify potential areas of change.
6. Design a plan that addresses SLA risk areas.
7. Ensure data redundancy.
8. Solicit executive buy-in and commitment.
9. Train appropriate personnel.
10. Test and adjust the plan.

3 DEVELOPING A BUSINESS CONTINUITY PLAN: 10 STEPS TO SUCCESS

A successful business continuity plan begins by recognizing that technology is just one part of an overall strategy. The plan must take into account each and every system and process that is at work when the company is in optimal operation and then must define precisely how a seamless transition will be made for each system and process when any downtime occurs.

Thus, developing such a plan involves careful study and analysis covering every aspect of a company's operation. A model approach to this development might look like this:

Step 1: Conduct a business impact analysis of all critical data and systems within the organization. An effective business continuity plan is built on a clear understanding of how the business works. What data and systems are vital to the company's continuing operation? What business processes use them? What elements of the IT infrastructure support them? Who are the people who depend upon them? How do customers interact with them?

A careful analysis at this stage provides a clear landscape of the issues at hand. Obviously, this kind of analysis involves the active participation of virtually every department, team, and workgroup within the company as well as all the outside consultants, vendors, and support services the company uses. So it is important to get buy-in at every organizational level to ensure that the finished analysis both covers every critical system and data set and meets the approval of those who will be directly affected by the resulting business continuity plan.

Step 2: Assess and rank the potential losses caused by a disruption. Once the universe of the business continuity problem is understood, the next step is to look at the consequences of a data or system loss. What kinds of disruptions are most likely to happen? What critical data or systems are likely to be affected? What business processes depend on them? What kinds of losses, both financial and intangible, will occur if these processes stop functioning? How will those losses increase over time? How will customers be affected? How long will it take to recover those losses once the processes are restored?

The objective in this step is to see where the biggest threats to a company's survival lie in the case of a data loss. Understanding and rank-ordering those threats are vital parts of the plan's development, because it will be virtually impossible to protect every single system and process from every single eventuality. Budget and resource limitations will mandate the prioritization of these threats as the plan takes shape, so that the finished business continuity solution provides maximum protection from the most significant threats.

Step 3: Define service level agreements (SLAs) for all identified data and systems. The next task is to create a set of performance benchmarks for the systems and data that are at risk. What are the minimum requirements for reliability and availability? What are the appropriate recovery time objectives (time between disaster and recovery)? What are the appropriate recovery point objectives (how

much data loss is acceptable when business processes resume)? What retention policies (how long data must be kept) must be put in place?

By creating set and agreed-upon service levels for all at-risk data, systems, and the processes they support, the company will be more easily able to design a business continuity program that meets its needs efficiently and with minimum waste or overlap.

Step 4: Assess the current IT infrastructure. Now comes the process of evaluating the IT infrastructure and its existing disaster recovery program and processes. What hardware, software, and other equipment make up the IT environment? What is the company's current backup and recovery plan? What are its strengths and weaknesses? What hardware and software systems handle backup and recovery? How many different operating systems, hardware types, software applications, and other elements must be supported? Are there remote or distributed locations that are currently not supported? What outside vendors or consultants also own part of the data and systems that must be supported?

Knowing how the current IT environment functions and how (and how well) the disaster recovery program is now working, it becomes much easier to see where the company stands in terms of the changes necessary to meet the SLAs and deal with the identified threats described earlier.

Step 5: Identify potential areas of change. At this point, the new business continuity plan begins to take shape. The company knows what data and systems are the most important in ensuring continuity, where the biggest risks are, the SLAs necessary to maintain operations, and where the strengths and weaknesses are in the current IT environment. How is that environment likely to change over time (new operating systems, hardware, locations, etc.)? How will those changes affect the people and processes that depend on the company's vital data? What parts of the IT infrastructure need to be upgraded or improved? What capabilities/features need to be added to the existing backup and recovery systems to meet SLA requirements?

What emerges from this step is an actionable list of items that must be addressed in order to fully implement the business continuity plan.

Step 6: Design the business continuity plan using disk-based backup solutions to address all identified SLA risk areas. This is the point where the plan starts to become a reality. With steps 1–5 completed, a comprehensive written business continuity plan is created that covers each of the previously identified SLA areas. Working with a selected solution provider, a technology solution is devised (and implemented) that incorporates both disk-based storage hardware and data and backup management software. The system must fully meet or exceed all SLA requirements and be powerful and flexible enough to continue meeting those requirements as the IT environment changes over time.

Disk-based solutions can provide the required performance, reliability, and scalability necessary to meet demanding SLA requirements. Since the hardware and software elements of the designed system must work seamlessly in order to meet the company's SLA requirements, it is important to choose a solution provider whose products offer complete integration.

Step 7: Ensure data redundancy by including tape and/or WAN backup/replication to an off-site location. An effective business continuity plan offers both immediate and long-term backup and storage capabilities. These two capabilities serve different purposes. Near-line disk-based storage solutions handle the immediate capabilities, backing up large amounts of data quickly and with minimum impact on network traffic and allowing for fast restore times. In most disruption scenarios, this will be sufficient. However, in the case of a catastrophic

loss due to a natural disaster or other event where a large part of the IT environment itself is destroyed, the data must be backed up and stored at a secure off-site location. Off-site storage is also appropriate for data that must be stored long-term to meet regulatory compliance or other requirements. Tape or WAN backup devices are ideal for this kind of storage.

In creating this necessary level of redundancy, the importance of having a fully integrated solution becomes clear. Ideally, the integrated solution will provide a consistent, easy-to-use interface that simplifies and speeds the process of defining backup and restore parameters (such as creating independent retention periods for each backup job) for both near-line and off-site storage devices, whether disk- or tape-based. Integration also helps minimize restore times by making it easier to identify and find specific data sets to be recovered.

Step 8: Solicit executive buy-in and commitment to the business continuity plan. As previously stated, the business continuity plan covers every department and every aspect of the business. Without a clear mandate and ongoing support from the executive suite, individual departments or workgroups may not be willing to commit the time and resources necessary to provide IT with the information it needs to complete the plan. In addition, executive management must also buy into and express its ongoing support for the plan itself: its objectives, its design, and its implementation.

Step 9: Train appropriate personnel on the business continuity plan. With the plan complete, in place, and enjoying the full support of senior management, the task shifts to making sure that it is fully understood and implemented companywide. This involves two levels of training: first, a high-level overview of how the plan works, why it was developed, and how it affects the day-to-day work of individual employees. Second, personnel who are directly involved with the data storage and protection must be trained on how to use and interact with the system and, of course, steps they must follow in case of a disruption or catastrophic loss.

Step 10: Test and adjust the plan as necessary. No one in IT needs to be told about the constancy of change. Keeping a business continuity plan effective requires that it be regularly and rigorously tested, at least on an annual basis. And, as the IT environment and the company's needs, processes, and objectives change, the plan and its hardware and software elements must continuously be evaluated to identify weaknesses or potential areas of expansion.

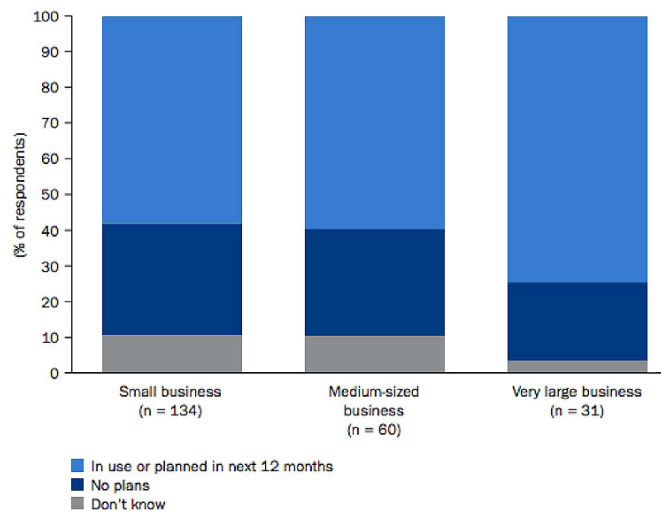
Clearly, taking these steps requires a major commitment of time, resources, and executive support. But considering the importance of the data and the risk involved should a major disruption occur, the investment required will be recouped many times over. And given the size and complexity of the job, it also makes good sense to be as thorough and complete as possible in developing the plan and to carefully choose solutions that provide both low TCO and maximum long-term benefit.

4 ACHIEVING BUSINESS CONTINUITY WITH BAKBONE NETVAULT: BACKUP AND NETAPP NEARSTORE VTL SOLUTIONS

A business continuity plan is only effective if the identified requirements (such as key SLAs) are achievable and if the critical systems are protected. Shrinking backup windows and the need to quickly recover critical business systems in the event of an outage have led to the increasing use of disk-based technologies. According to an

IDC/Infoworld 2005 "Trends in Storage Survey," more than half of the SMBs and large businesses surveyed identified disk-based backup as a solution they are implementing to accelerate backup and recovery. Integrated virtual tape library (VTL) technology from BakBone and NetApp combines the performance and reliability of disk-to-disk backups with the familiarity of tape-based processes, minimizing operational impact.

Is your company currently using or planning to use in the next 12 months disk-based backup or virtual tape solutions for accelerated backup and recovery?



Base = respondents involved in the acquisition of any type of storage solution
 Source: IDC/Infoworld 2005 Trends in Storage Survey

Figure 2 U.S. business current or planned use of disk-based backup or virtual tape by company size category.

While a wide range of options of VTL technologies is available, it's important to remember that the biggest single ongoing cost of business continuity lies not in the hardware or software, but rather in the people and resources necessary to *operate* the solution day to day. To achieve both low total cost of ownership and business continuity objectives, choose a hardware/software solution that offers:

- **Complete integration** to ensure maximum data availability and manageability
- **Flexibility** to handle the most heterogeneous environments
- **Ease of use** that minimizes training and resource requirements

NetApp and BakBone have long partnered to deliver industry leading data protection solutions. As a result, the two companies have developed proven and tightly integrated disk-based backup and data protection solutions that scale to meet the demands of the largest open systems backup environments. According to Mike Arends, vice president, Storage Group, Arrow Enterprise Computing Solutions, "the BakBone and NetApp NearStore VTL solution offers our partners a tiered storage solution to help enterprise customers manage data from creation through long-term archive. Our community of enterprise storage partners are eager to go to market with data protection solutions that ease administration and lower costs while meeting higher service levels." What follow are three best practices for addressing

common business continuity issues using NetVault: Backup and NearStore VTL technologies.

Incorporate NearStore VTL and NetVault: Backup into business-critical processes where SLAs are not being met.

The NetApp VTL disk-to-disk backup appliance and BakBone's NetVault: Backup software work together to form fully integrated solutions that significantly improve both recovery time objectives (RTOs) and recovery level objectives (RLOs).

This solution begins with the NearStore VTL,³ which appears like a tape library to the backup software application, but provides the superior speed and reliability of disk-based technologies. The NearStore VTL is attached to the network or a server via a high-speed fiber connection for maximum speed. The NearStore VTL appliance can then be used to back up any NetVault: Backup supported open system storage environment.

The NearStore VTL is easily configured and can immediately increase existing backup and recovery performance, regardless of the configuration of the legacy physical tape library. Backing up directly to the VTL ensures that backups complete reliably and at the highest performance levels that can be sustained by the backup server, and NetVault: Backup can be used to vault copies off to physical tape as required. When used in this manner, the virtual tapes can be configured completely independently of the physical tape system, since NetVault: Backup automatically converts the tape formats and adjusts to the size and speed of the physical tape device.

The combination of improved read/write speeds via the NearStore VTL and the disk-to-disk-to-tape optimization provided by NetVault significantly reduces backup and recovery times and helps achieve the RTO and RLO specifications as defined in the business continuity plan.

Utilize a disk-to-disk-to-tape strategy to complete business continuity objectives.

Tape-based storage will continue to be an important part of almost every effective business continuity plan. While tape is the best choice for off-site archival storage, it does have its drawbacks: it is difficult to manage and can be slow to back up to or restore from.

While many legacy systems continue to use tape-based storage as a primary means of data protection, today's business continuity requirements demand that tape-based solutions be augmented with higher-performing disk-based data protection. Gartner Group advises that data should be able to remain on disk for fast recovery, with a data mover in the appliance to speed the creation of physical tapes, yet have the backup software still able to maintain control of the location of all copies.⁴ This type of multitiered data protection strategy, which utilizes disk-to-disk backup for improved RLOs and RTOs, as well as disk-to-tape data protection for an off-site long-term storage option, provides the levels of performance and redundancy necessary in today's complex IT environments.

Off-site tape-based storage media can be integrated into the NetVault: Backup and NearStore VTL solution, either by connecting directly to the NearStore VTL appliance or through the network (via NearStore VTL's built-in high-speed Fibre Channel ports). Backups to both the NearStore VTL and the off-site tape media are defined and managed via NetVault: Backup, which can then set separate independent retention policies for both the disk-based NearStore VTL and off-site physical tapes. NetVault: Backup is also flexible enough to restore directly from either the VTL or an archive tape, eliminating the need to write data back to a VTL and then restore it to the server.

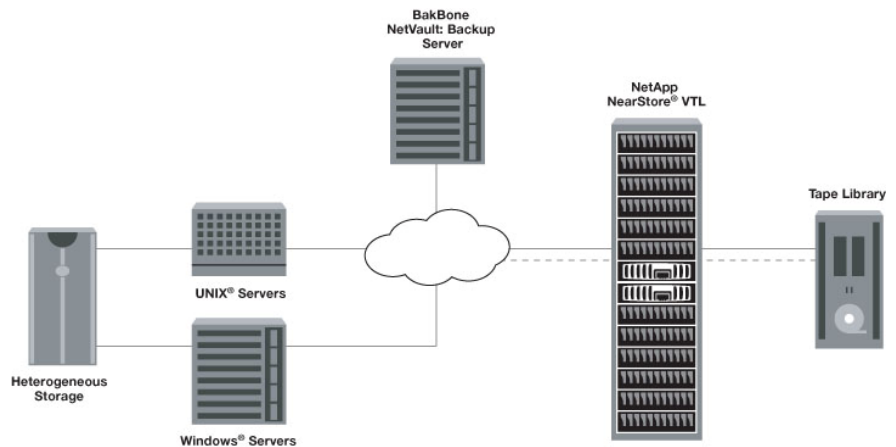


Figure 3 Optimized physical tape backup performance with NearStore VTL and NetVault: Backup.

NearStore VTL's Shadow Tape functionality is another key capability of this solution. As part of the disk-to-disk-to-tape process, the NearStore VTL provides an intermediate and nondisruptive step between primary storage and physical tape by creating a transparent, locally "cached" copy of the tape in the VTL for improved recovery performance. NetVault: Backup continues to manage the vaulting policies as well as the physical tape.

When NetVault: Backup needs to recover data that has already been removed from the NearStore VTL and written to physical tape, a check is first made to determine whether the required data is still available on disk as a shadow tape. If so, NetVault: Backup recovers from the disk-based shadow tape, providing the benefits of immediate access and fast restore times. If not, it recovers from physical tape. This process is accomplished transparently to the end user. BakBone recommends using NetVault: Backup to manage all data migration from the NearStore VTL to physical tape.

The integrated NetApp and BakBone disk-to-disk-to-tape solution provides the benefits of both near-line disk-based storage and off-site tape-based storage managed with NetVault: Backup's easy-to-use interface. This solution improves backup and recovery time and enables companies to meet service levels for creating off-site tapes, while maintaining existing disaster recovery plans based on recovery from physical tape backups.

In a business continuity system where both disk and tape play a vital role, BakBone and NetApp combine their strengths into a single, unified, and easy-to-manage solution.

Maintain existing operational processes using NearStore VTL and BakBone tape library emulation/automation.

One of the biggest obstacles to the implementation of any business continuity plan is the learning curve involved in making the new system work correctly. If the defined business continuity processes and procedures are not followed, then the strategy will never succeed. The integrated NearStore VTL and NetVault: Backup solution directly addresses this concern.

NetVault: Backup manages the NearStore VTL with the same intuitive interface used to manage physical tape libraries. Since NearStore VTL itself mimics a tape library, the BakBone and NetApp solution can be implemented with minimal impact on staff or IT processes.

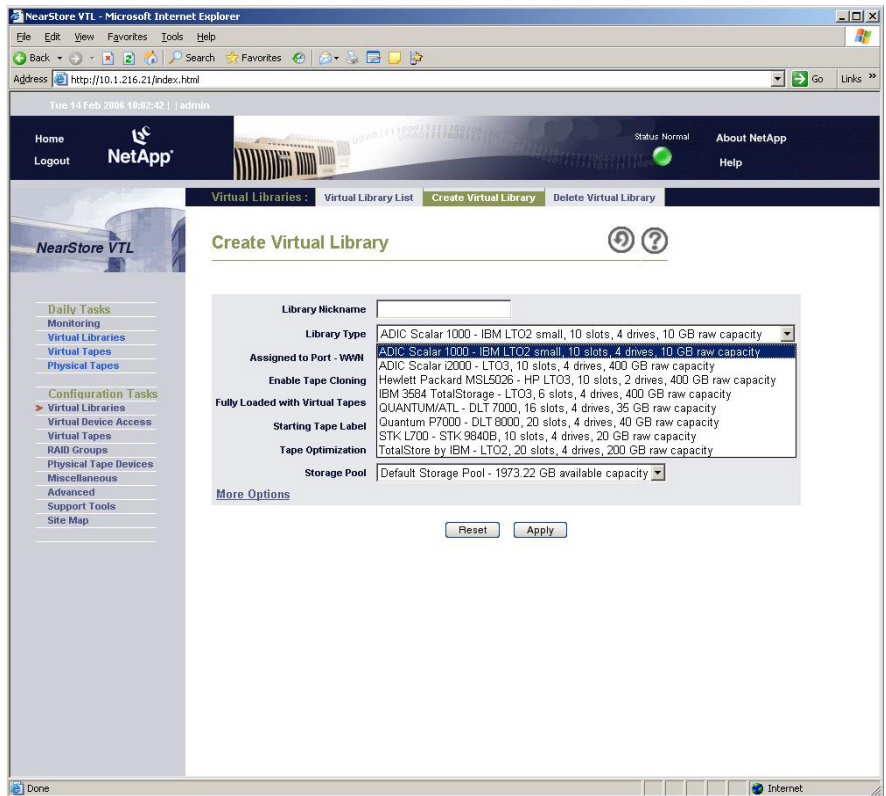


Figure 4 NearStore VTL tape library emulation.

BakBone NetVault: Backup provides a single, integrated console for managing all backup and data protection needs. It uses a simple, consistent graphical user interface to manage Snapshot™ copies or to manage backups to NearStore VTL, BakBone VDL, or physical tape, as well as for scheduling and policy management.

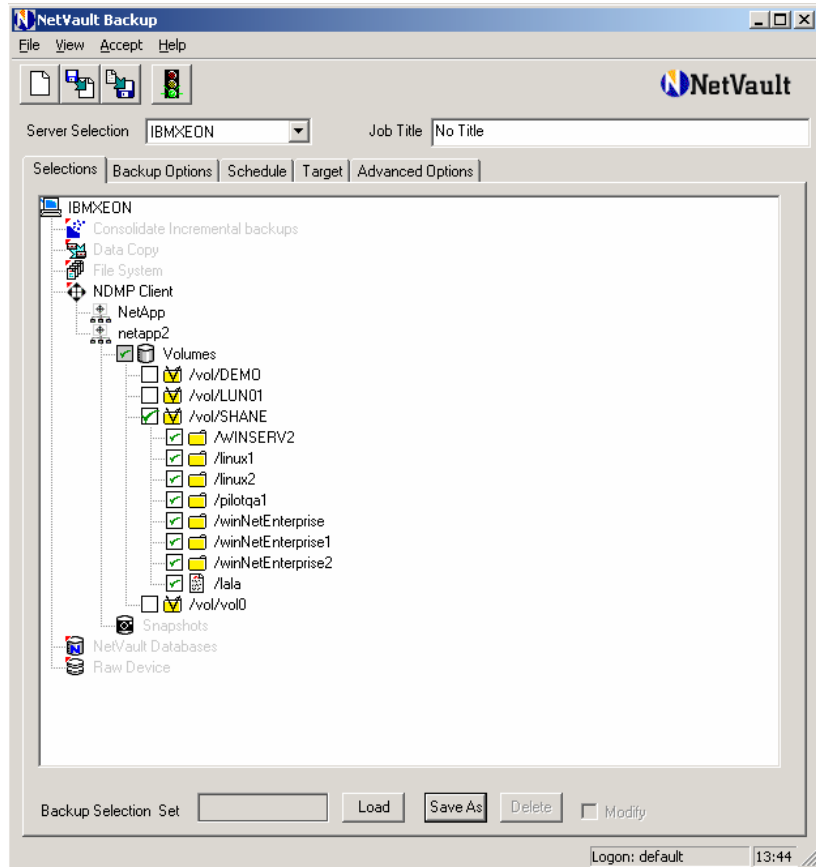


Figure 5 NetVault graphical user interface simplifies the management of NetApp environment.

NetVault: Backup also automatically adapts to the slot capacities of the emulated NearStore VTL tape libraries. Rather than using the individual drivers of the tape library, NetVault: Backup utilizes the standard SCSI command interface to automatically discover how many slots are contained in a library. Thus, NetVault: Backup can easily mimic any tape library configuration, whether physical or virtual.

NetVault: Backup also features powerful disk-to-disk-to-tape automation and policy management capabilities, so that in a single backup job, data can be backed up first to the NearStore VTL, and then to off-site tape media. NetVault: Backup's tape management and policy management functionality allows retention policies to be set once and managed centrally. BakBone recommends that NetVault: Backup is used to manage NearStore VTL to tape migration, since this allows for the utilization of backup software control and policy management.

By making the solution easy to implement and use, NetApp and BakBone lower total cost of ownership and improve the success of the business continuity plan.

5 SUMMARY

The traditional “break/fix” model of disaster recovery is quickly passing into history. Businesses now recognize that they cannot survive without quick and reliable access to vital data in the event of any kind of disruption, and the new strategy of business continuity protection has grown from that recognition.

Business continuity plans take an enterprise-wide approach to maintaining application and data availability. They cover all critical business processes and data sets and provide recovery solutions for any type of data loss.

Developing and implementing an effective business continuity plan require following a careful step-by-step process. Using this process, IT can build a clear picture of the existing environment, threats posed by system failures, and the strategy necessary to maintain all vital business processes. Such a solution generally is composed of near-line storage area network (SAN) hardware, off-site tape-based media, and software technology that drives and manages the entire data protection processes. In today’s data-intensive business environment, a successful business continuity strategy must also include tightly integrated disk-based solutions, such as those offered by BakBone NetVault: Backup and NetApp NearStore VTL.

By adhering to the following best practices, organizations can better achieve a successful business continuity strategy:

- Incorporate NearStore VTL and BakBone NetVault: Backup into business-critical processes where SLAs are not being met.
- Utilize a disk-to-disk-to-tape strategy to complete business continuity objectives.
- Maintain existing operational processes via NearStore VTL and BakBone tape library emulation/automation.
- Leverage BakBone and NetApp integration options to optimize protection of a distributed, multivendor IT environment.

NetApp and BakBone Software’s virtual tape library technologies merit serious consideration as a business continuity solution. The two companies are industry leaders whose long-term partnership has produced comprehensive data protection solutions that can fulfill any business continuity need.

To find out more about the BakBone and NetApp partnership and the companies’ comprehensive storage and data protection solutions, visit www.bakbone.com/netapp or e-mail netappsales@bakbone.com.

A free 45-day evaluation copy of BakBone’s NetVault software is available for download at www.bakbone.com/products/downloads.

NOTES

1. Source: Microsoft Storage Glossary:
www.microsoft.com/windowsserversystem/storage/storgloss.mspx.
2. Source: Gartner Group.
3. www.netapp.com/products/nearstore/nearstore-vtl.html.
4. Source: Gartner Group, "Virtual Tape Begins to Find Open Systems Market Acceptance," August 2004.



© 2006 Network Appliance, Inc. All rights reserved. Specifications subject to change without notice. NetApp, the Network Appliance logo, and NearStore are registered trademarks and Network Appliance and Snapshot are trademarks of Network Appliance, Inc. in the U.S. and other countries. Windows is a registered trademark of Microsoft Corporation. UNIX is a registered trademark of The Open Group. All other brands or products are trademarks or registered trademarks of their respective holders and should be treated as such.
WP-7000-1006