LAB VALIDATION REPORT

Dell PowerVault DL2000

Powered by Symantec Backup Exec

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ESG Lab Reports

The goal of ESG Lab reports is to educate IT professionals about emerging technologies and products in the storage, data management and information security industries. ESG Lab reports are not meant to replace the evaluation process that should be conducted before making purchasing decisions, but rather to provide insight into these emerging technologies. Our objective is to go over some of the more valuable feature/functions of products, show how they can be used to solve real customer problems and identify any areas needing improvement. ESG Lab's expert third-party perspective is based on our own hands-on testing as well as on interviews with customers who use these products in production environments. This ESG Lab report was sponsored by Symantec.

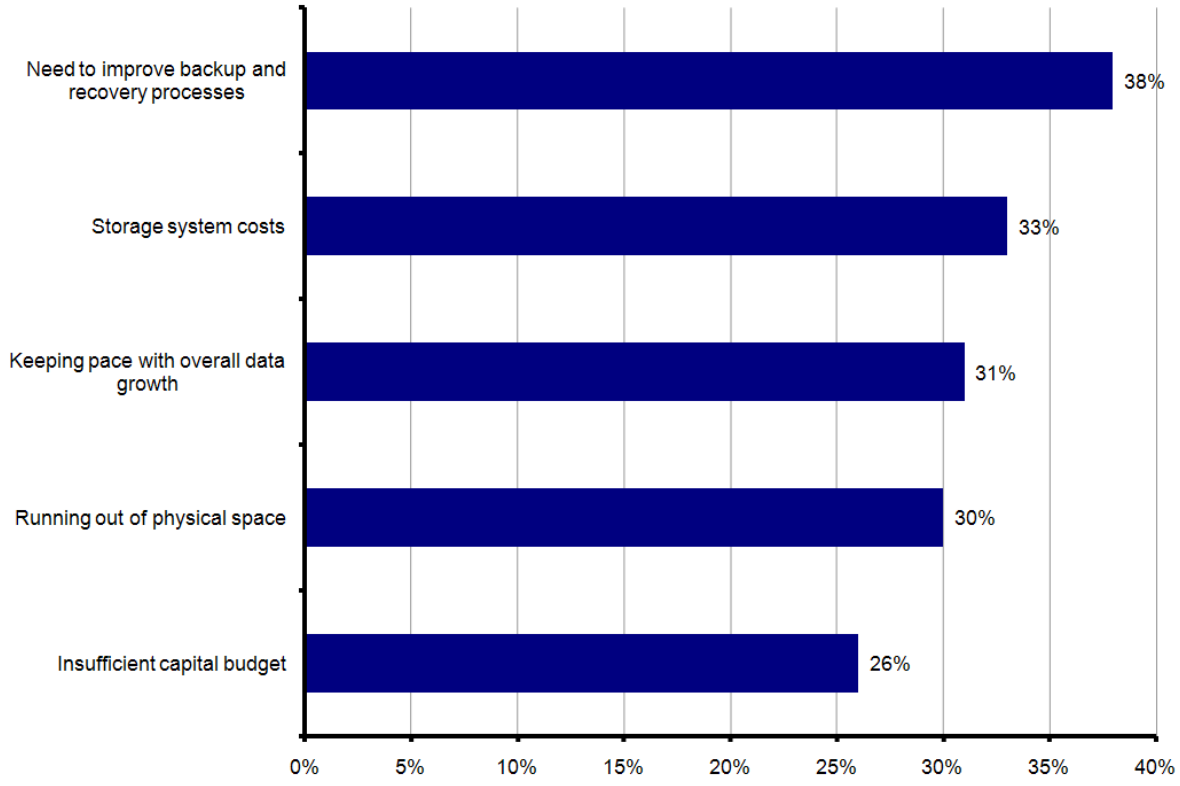
Introduction

The Dell PowerVault DL2000 is designed to provide broad-spectrum data protection for physical and virtual systems for small and medium-sized businesses in a turn-key appliance. This ESG Lab Validation explores how the DL2000, pre-installed with Symantec Backup Exec 12.5 software, can be deployed to protect critical data in about 20 minutes. This report also explores how the DL2000 can be used to protect Microsoft applications by providing tightly integrated backup and granular recovery of Microsoft Office SharePoint Server (MOSS), Exchange, SQL Server, and Active Directory, as well as VMware and Microsoft virtual servers.

Background

Small and medium-sized businesses (SMB), defined as having fewer than 1,000 employees, are faced with many of the same data protection challenges as their counterparts in the enterprise. In addition to performance and reliability, smaller businesses must frequently make do with backup administration and tape management performed by untrained IT staff. In a recent survey of more than 500 IT professionals and executives in medium-sized businesses, ESG research found that the number one reported storage environment challenge was the need to improve backup and recovery processes.[1]

FIGURE 1. TOP STORAGE CHALLENGES AMONG MEDIUM-SIZED BUSINESSES



Accelerated growth of stored data, the cost of the systems and capacity required to keep pace with that growth, and tight budgets were also significant issues. In addition, IT professionals in small businesses (defined as less than 100 users) told ESG that 16% of all attempted restores failed. Said another way, nearly 1 in every 6 attempts was unable to successfully recover needed data.[2] Looking at all of these challenges together, it's clear

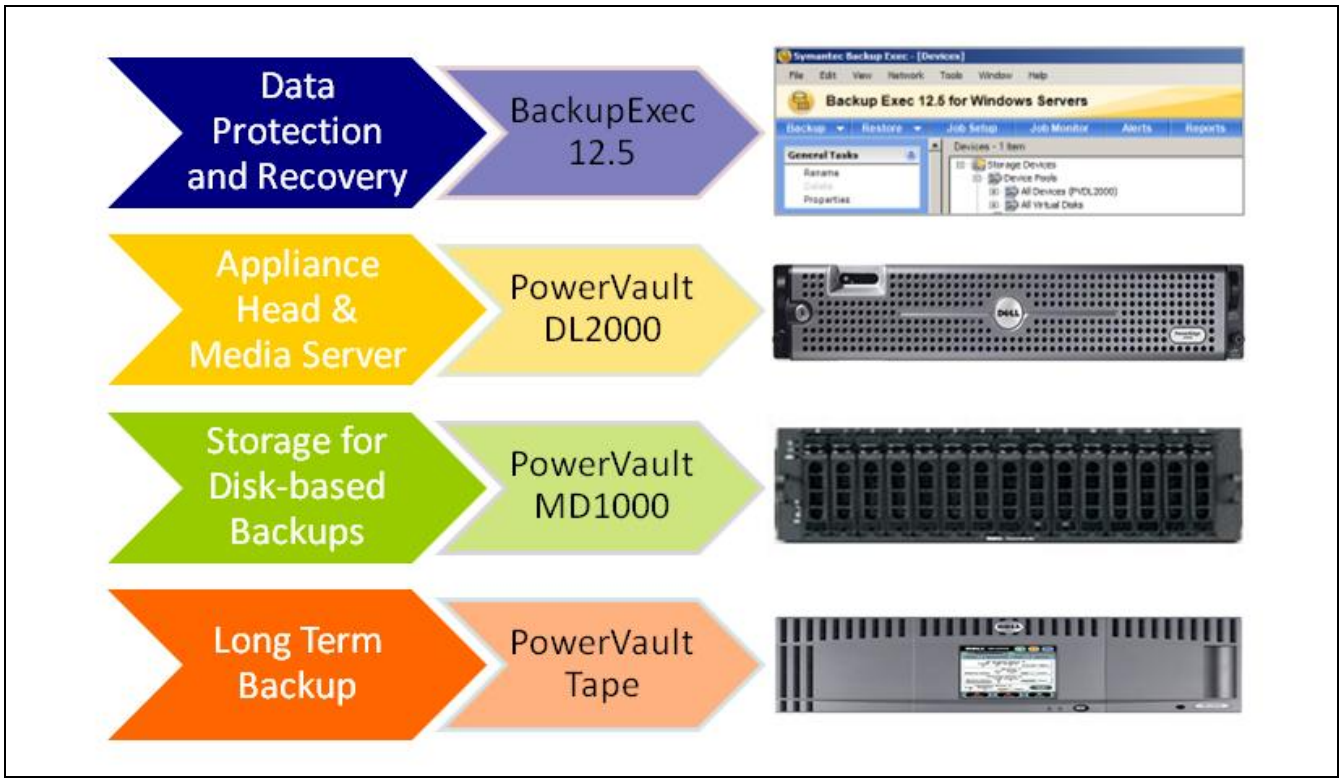
[1] Source: ESG Research Report, *Medium-Sized Business Survey*, June 2008
[2] Source: ESG Research Report, *Data Protection Market Trends*, January 2008

that small and medium-sized businesses need cost effective data protection solutions that are easy to buy, deploy, and manage.

The Dell PowerVault DL2000 Powered by Symantec Backup Exec provides data protection for small to medium-sized businesses in an integrated Backup to Disk appliance. The PowerVault DL2000 is designed for ease of use and simplified deployment and integrates tightly with Microsoft application and file servers as well as virtual server environments.

As portrayed in Figure 2, the Dell PowerVault DL2000 Powered by Backup Exec is an all-in-one disk-to-disk-to-tape backup solution that combines Symantec Backup Exec software, a Dell DL2000 server, Dell PowerVault MD1000 disk enclosures, and optional PowerVault tape storage.

FIGURE 2. DELL POWERVAULT DL2000 POWERED BY BACKUP EXEC



The intelligence is provided by Symantec Backup Exec 12.5, a high-performance data management solution designed for small and medium-sized businesses. Symantec has partnered with Dell to create a pre-installed solution that has been designed to minimize the installation and configuration complexity normally associated with backup hardware and software integration. Features of the PowerVault DL2000 Powered by Backup Exec 12.5 include:

- Factory installed and ready to configure disk-based data protection appliance
- Continuous Data Protection with Granular Recovery Technology
- Complete protection of Windows files and applications (Exchange, SQL, SharePoint Active Directory)
- Complete protection of Oracle under Windows and Linux
- Flexible virtual server support (VMware Virtual Infrastructure & Microsoft Virtual Server and Hyper-V)
- Integrated storage provisioning, monitoring, and management

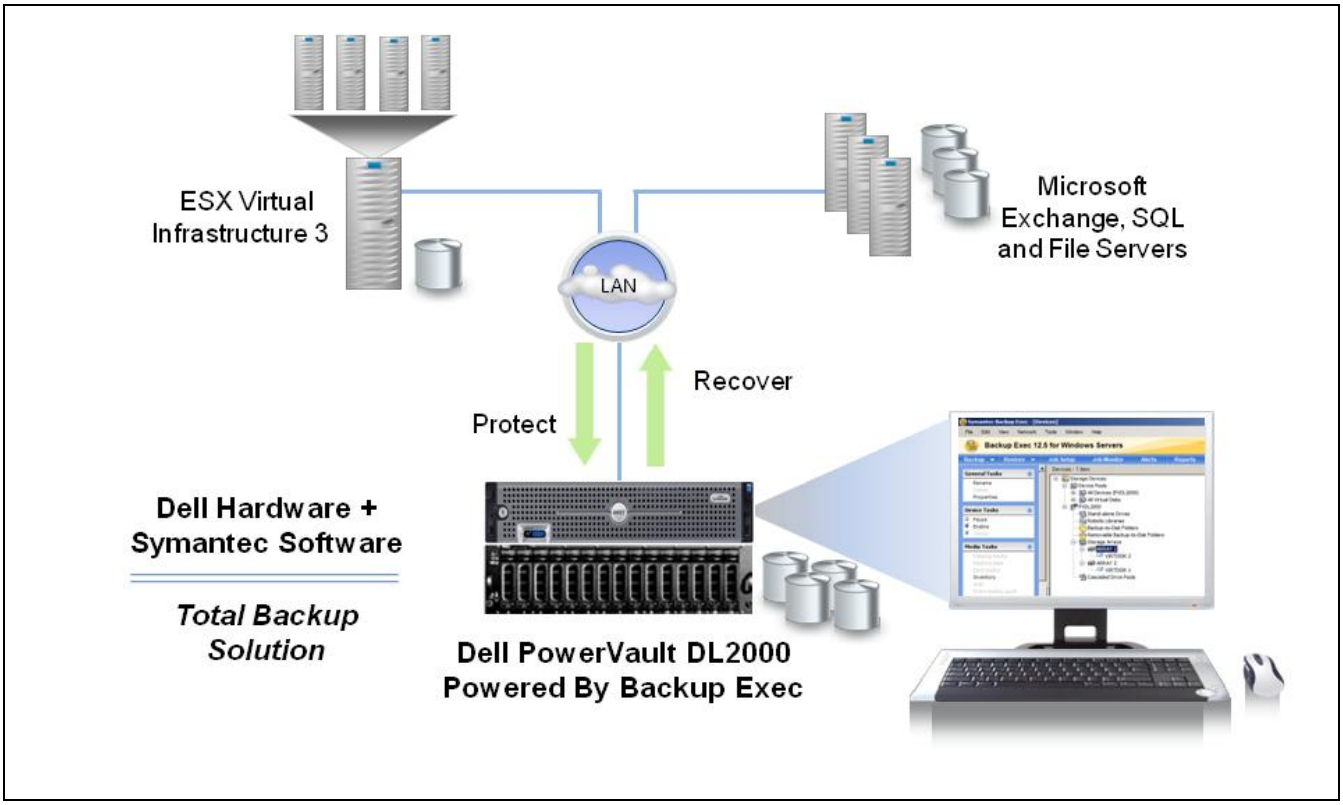
The balance of this report documents ESG Lab testing of Dell PowerVault DL2000 Powered by Symantec Backup Exec with a focus on ease of deployment, ease of management, and quick backup and recovery of the applications and virtual server environments that small to medium-sized businesses have come to rely on.

ESG Lab Validation

ESG Lab performed hands-on evaluation and testing of Dell's PowerVault DL2000 Powered by Symantec Backup Exec at Symantec's Austin, Texas facility. The test bed used by ESG Lab is shown in Figure 3.

Physical and virtual servers were connected to the Dell PowerVault DL2000 over a gigabit Ethernet LAN. Four physical servers were in the environment: three servers running Microsoft Windows 2003 (SP2) and one server running VMware ESX managed by a VMware Virtual Infrastructure server. The three physical servers were running Microsoft Exchange, Microsoft SQL Server, and Microsoft file services. The VMware ESX server housed four virtual machines, each running Windows 2003 (SP2) as a guest OS.

FIGURE 3. ESG LAB TEST BED



Dell hardware and Symantec software, packaged and pre-installed at the Dell factory, were combined to create a total backup, recovery, and data management solution. The hardware used to protect and recover physical and virtual server data was composed of a DL2000 server and a PowerVault MD1000 disk enclosure housing eight 500 GB SATA disk drives. The Dell PowerVault DL2000 is powered by Backup Exec 12.5, the latest version of the field–proven data management software solution from Symantec.[3]

[3] Configuration details are documented in the Appendix.

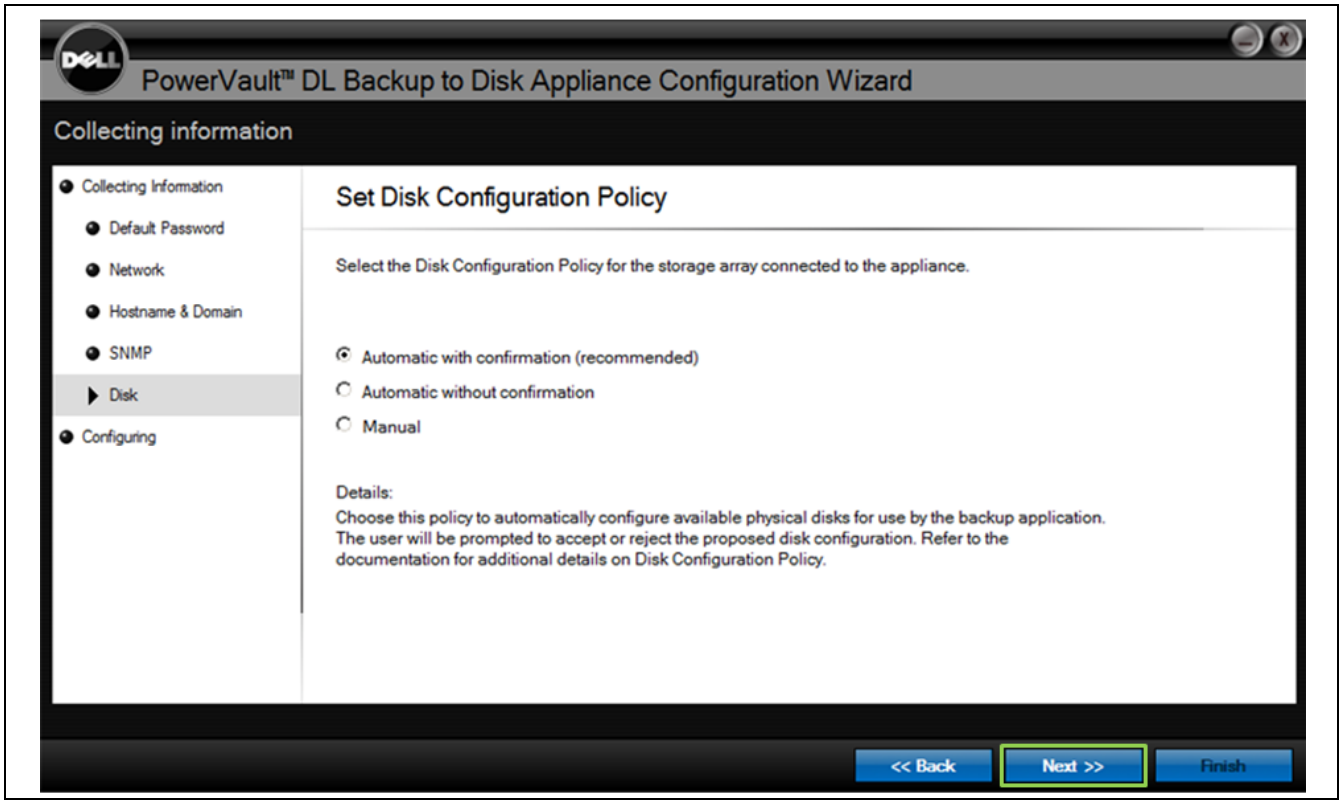
Getting Started

The Dell PowerVault DL2000 is shipped factory configured with a Windows Server 2008 operating system and Symantec Backup Exec 12.5 backup software. Configuration is accomplished via wizard-driven automation that guides users through the process of setting up the backup to disk appliance, including storage provisioning and backup software setup.

ESG Lab Testing

ESG Lab began by powering on the DL2000 system. The PowerVault Configuration wizard launched automatically. The automated wizard was used to configure basic server settings, including the management interface password, and basic network settings, including the hostname and active directory domain name. The wizard driven configuration process continued with a selection of the disk configuration policy as shown in Figure 4. ESG Lab selected the Automatic configuration policy. Automated end-to-end disk configuration proceeded behind the scenes after clicking the 'Next' button.

FIGURE 4. DELL POWERVAULT CONFIGURATION WIZARD

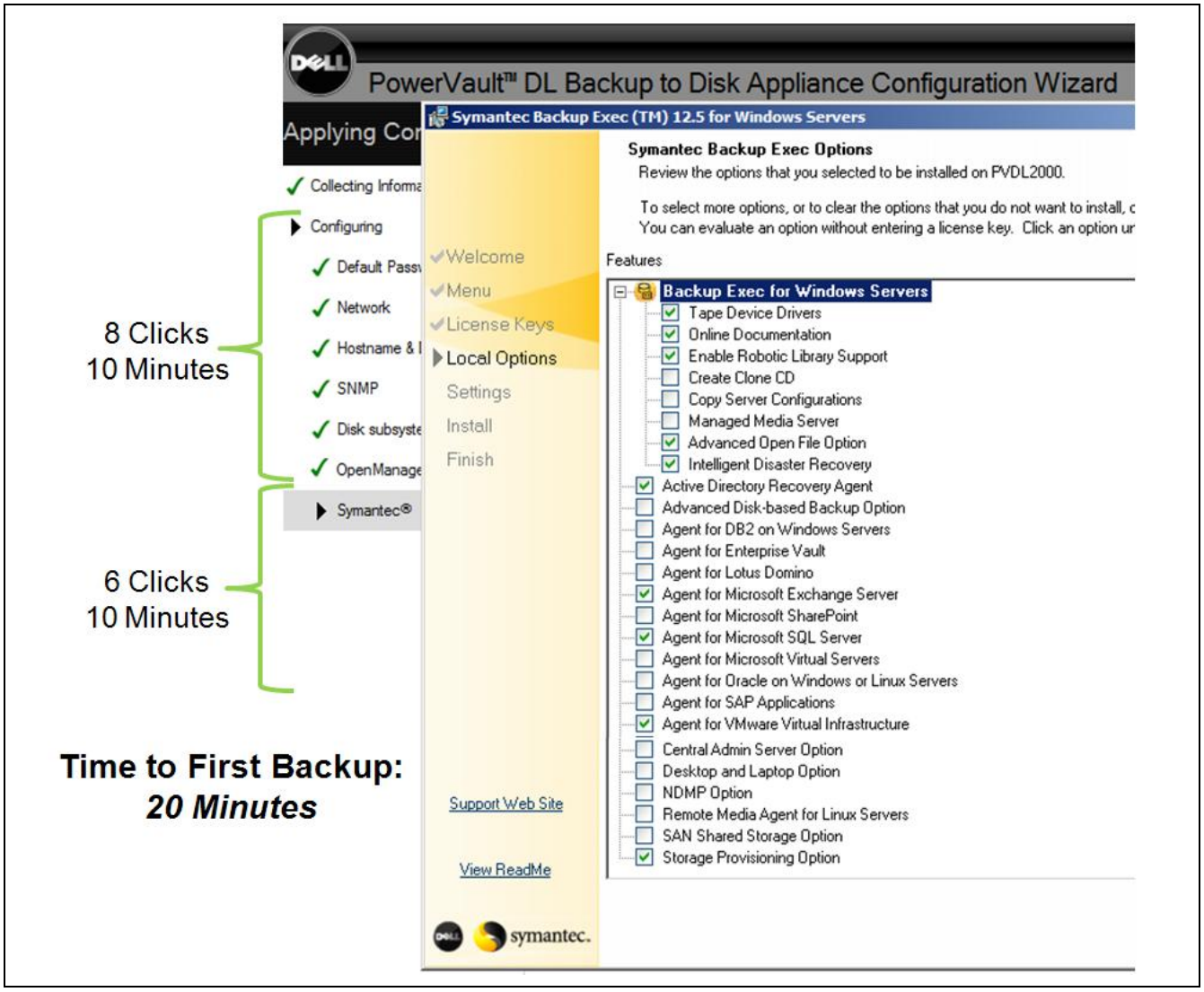


After eight mouse clicks and ten minutes, ESG Lab had configured the Dell PowerVault DL2000 appliance including storage capacity, network settings, and login credentials.

The next step was a quick automatic reboot followed by configuration of the Symantec Backup Exec software. The Backup Exec options and agents needed to backup and recover the physical and virtual servers in the ESG Lab test bed were selected using the screen shown in Figure 5. The following agents were selected, configured, and tested during the ESG Lab Validation: Microsoft Active Directory, Exchange Server, SQL Server, and VMware Virtual Infrastructure.

Backup Exec created a disk group and designated a hot spare based on the number of drives installed in the appliance. Next, Backup Exec determined the total amount of disk space available in the disk group. ESG Lab was then prompted to confirm the creation of virtual disks. Using the Automatic Configuration policy, Backup Exec created a RAID 5 virtual disk from the physical disks it detected in the DL2000 appliance. Six mouse clicks and ten minutes later, Backup Exec was configured and ready to protect the application servers in the ESG Lab test bed.

FIGURE 5. SYMANTEC BACKUP EXEC SETUP WIZARD

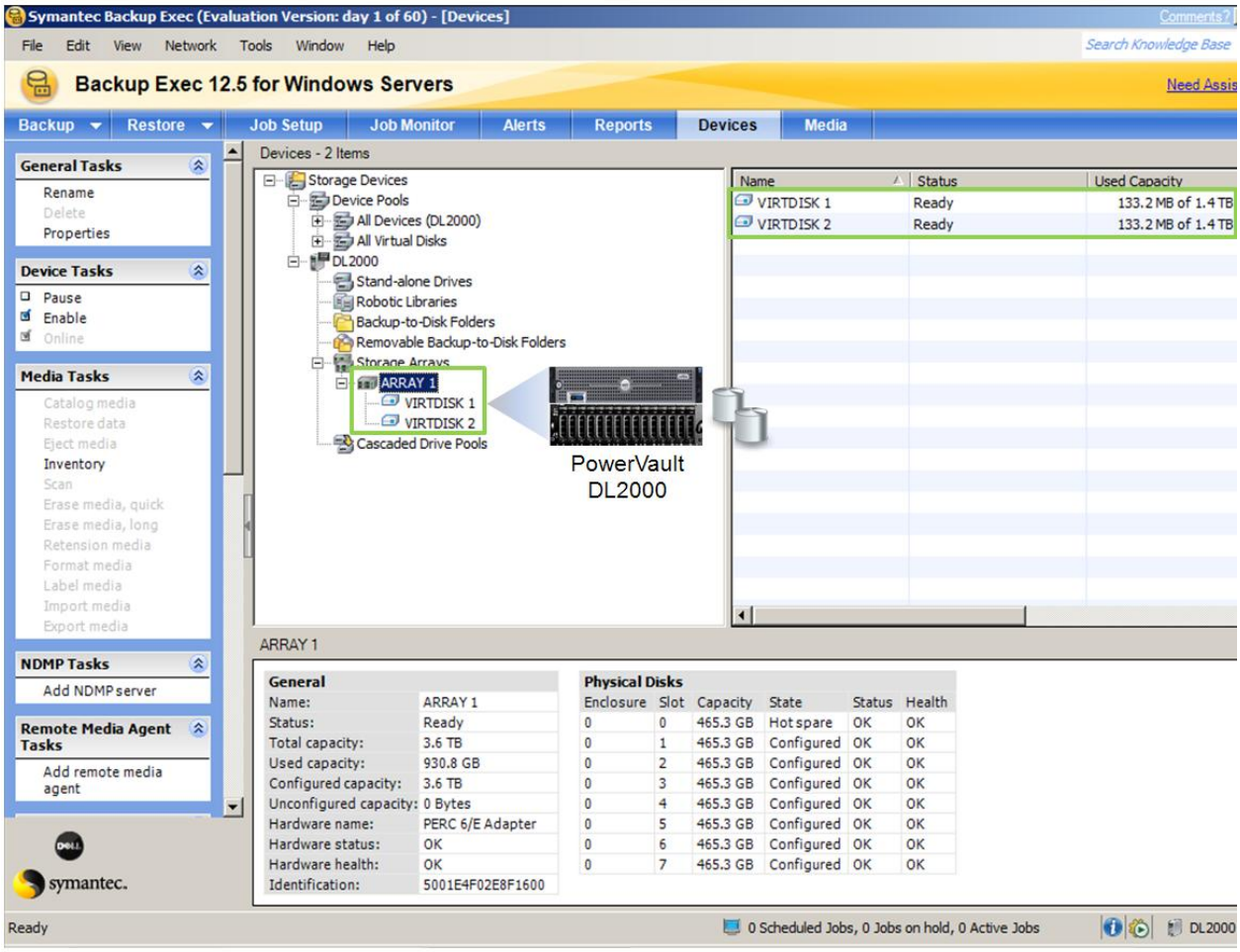


Twenty minutes and fourteen mouse clicks after getting started with Dell PowerVault DL2000 configuration process, a totally-integrated, factory-installed disk-based data protection solution was ready for the first backup job.

The Symantec Backup Exec management console was used to examine the configuration that had been automatically created during the wizard-driven configuration process. ESG Lab noted that the look and feel was exactly the same as that experienced by any existing Backup Exec customer, regardless of whether that customer is currently backing up to tape, to disk, or a combination of both.

As shown in Figure 6, the DL2000 disk array used during ESG Lab testing (ARRAY1) was configured as two virtual disks for disk-based backup and recovery operations (VIRTDISK1 and VIRTDISK2).

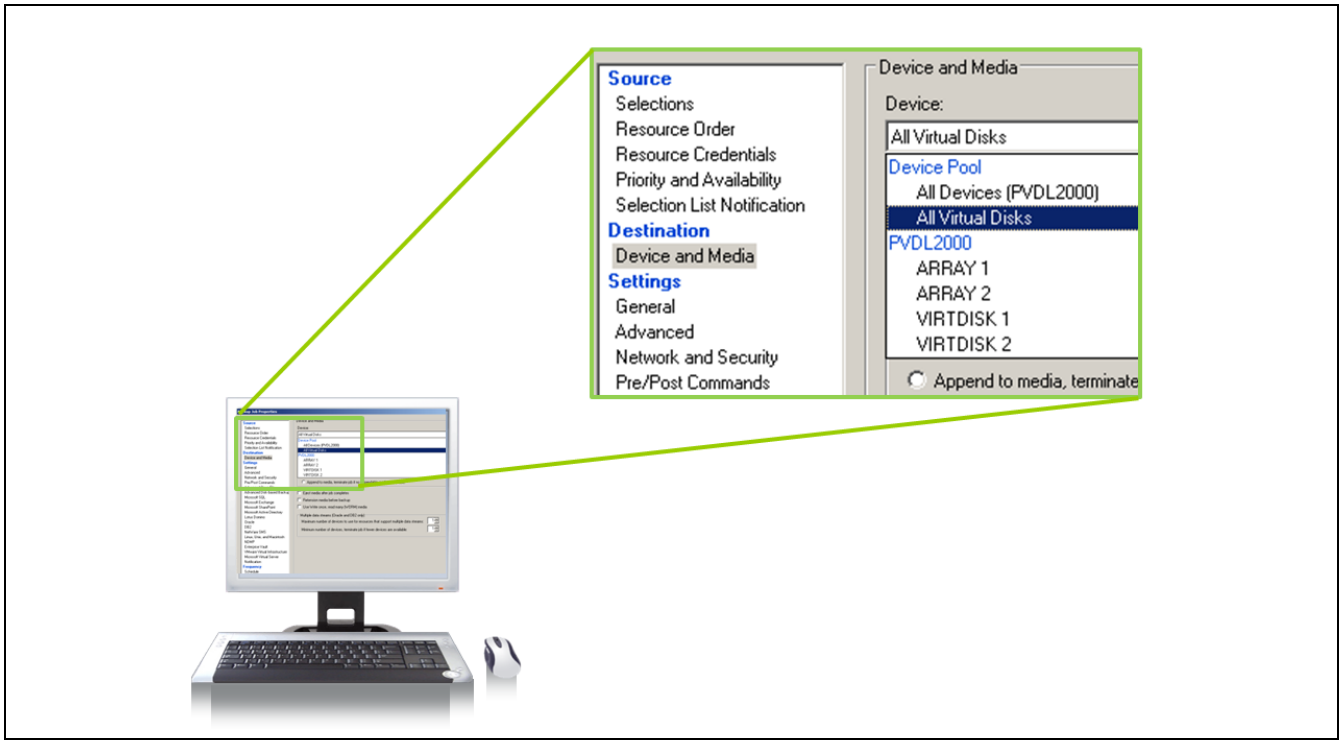
FIGURE 6. SYMANTEC BACKUP EXEC DEVICE CONSOLE



The total amount of usable disk space presented to Backup Exec is used by the wizard to create one or more virtual disks. With a maximum size per virtual disk of 2 TB, the single tray of MD1000 disk capacity in the ESG Lab test bed was used to create two volumes, each with a capacity of 1.4 TB as shown in Figure 6. Backup Exec managed this storage configuration detail, just as it managed all of the low level storage chores, including RAID configuration and hot spare assignment.

Twenty minutes after starting an initial configuration from scratch, the first backup job was started using the Backup Exec wizard as shown in Figure 7. In this screenshot, the destination for the backup data is being selected. Selecting the "All Virtual Disks" option enabled Backup Exec to use disk capacity on either of the available virtual disks pools.

FIGURE 7. PERFORMING A BACKUP TO THE POWERVAULT DL2000



Why This Matters

ESG research indicates that small to medium-sized businesses struggle with a diverse range of data protection challenges that ultimately lead to ineffectual processes, higher costs, and increased levels of business risk. Small businesses in particular are struggling with the complexity and cost of data protection. One of the key benefits of a purpose-built all-in-one data protection solution is that it reduces the cost and complexity of initial installation and deployment.

ESG Lab found that the initial configuration of a Dell PowerVault DL2000 solution is wizard-driven, fast, and easy. Twenty minutes and fourteen mouse clicks after beginning a configuration from scratch, the Dell PowerVault DL2000 Powered by Backup Exec was ready for the first backup job.

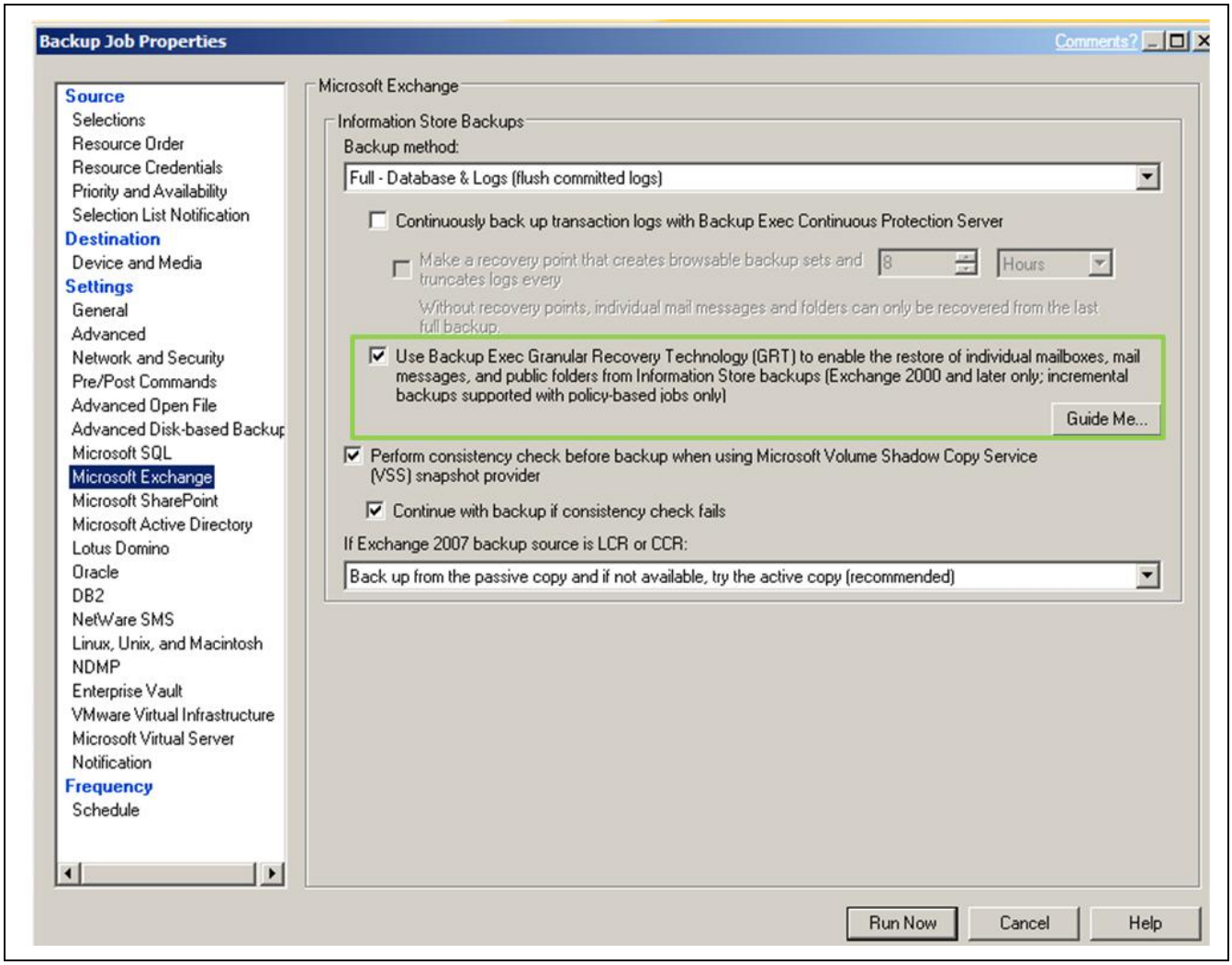
Exchange Recovery

The PowerVault DL2000 disk-based appliance provides continuous data protection of mission critical applications for quick, reliable backups and restores as well as integration with tape for long term archival. With Symantec's Granular Recovery Technology (GRT), Backup Exec provides granular recovery capabilities for files, Microsoft SharePoint, SQL Server, Exchange applications, Active Directory, VMware virtual servers and Microsoft virtual servers including Hyper-V. With Microsoft Exchange, for example, Backup Exec Granular Recovery Technology can recover mailboxes, folders, messages, or attachments without requiring a full database restore. Granular Recovery Technology allows the recovery of individual objects from single pass backups of databases and images. The traditional approach requires two backups, one of the entire database and a second separate individual object backup.

ESG Lab Testing

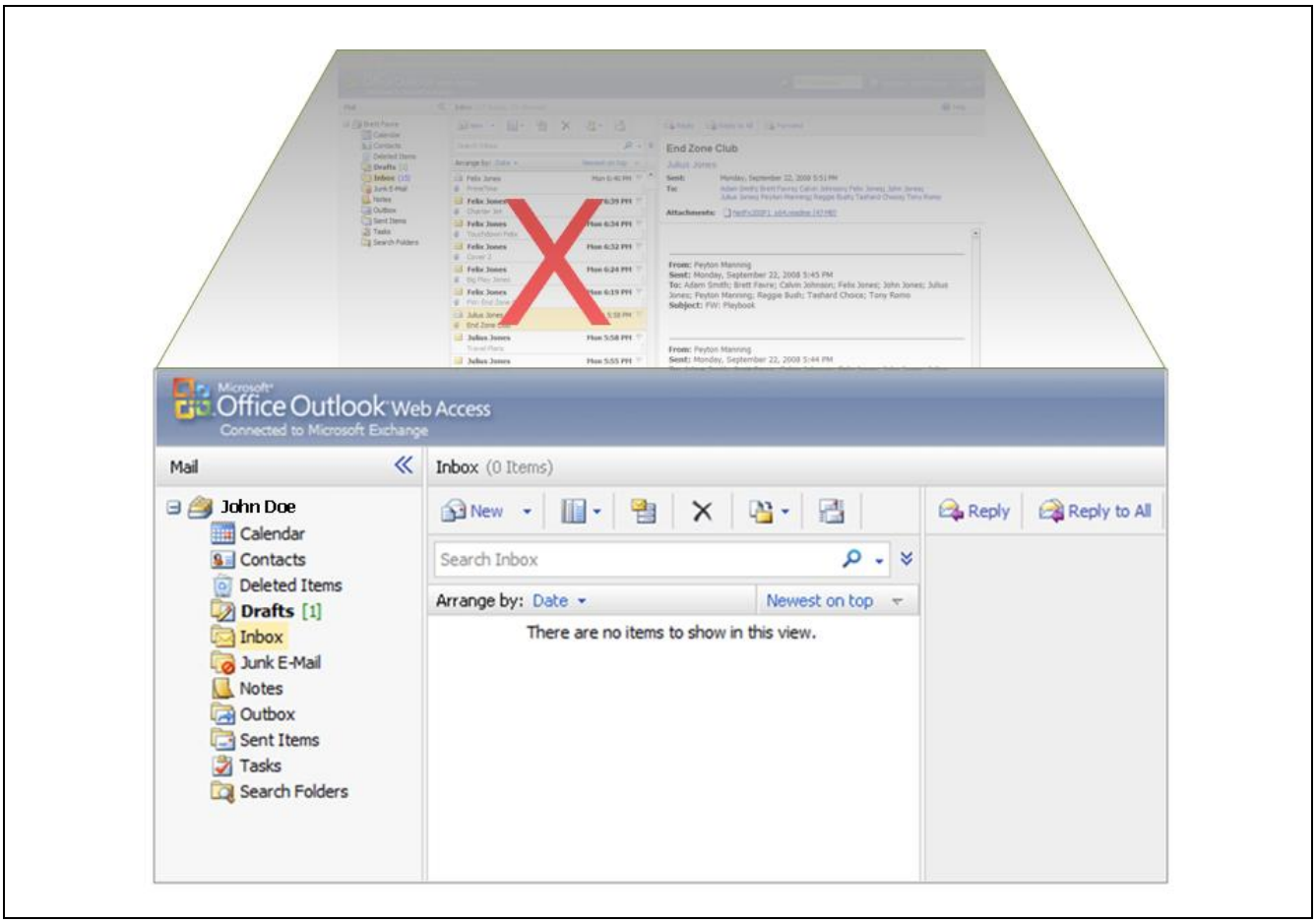
ESG Lab used Backup Exec's Granular Recovery Technology to restore messages accidentally deleted from an individual user's Inbox after a full backup of the Exchange database. Granular Recovery Technology was enabled during the wizard-driven configuration of the first full backup of Exchange using the interface shown in Figure 8.

FIGURE 8. MICROSOFT EXCHANGE BACKUP JOB PROPERTIES



An individual user's entire Inbox was deleted to simulate the recovery process after an end-user accidentally deletes one or more important e-mails as shown in Figure 9.

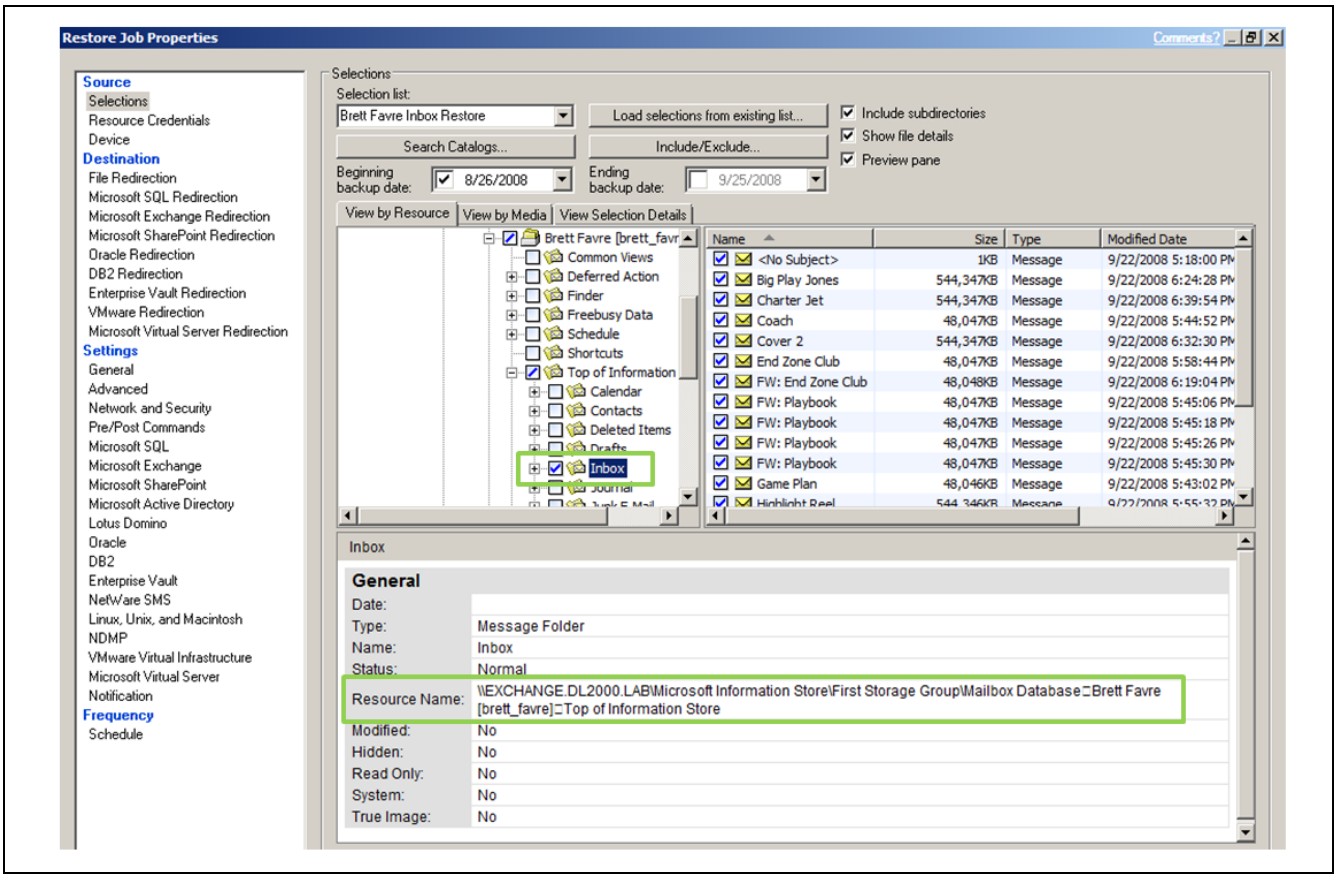
FIGURE 9. INBOX DELETED



A restore operation was initiated using the Backup Exec Restore wizard. The Restore Wizard guided ESG Lab through the creation of the restore job. ESG selected the backup set to restore from, the individual objects to restore, and the restore location.

Administrators can browse through the entire Exchange database during a restore operation as shown in Figure 10. In this example, ESG Lab selected the Inbox of a simulated user.

FIGURE 10. MICROSOFT EXCHANGE RESTORE JOB PROPERTIES



The Backup Exec restore wizard browses the details of each backup job, including when the backup was run, which files were backed up, and individual file details. After selecting the recently completed backup job and the simulated user's inbox, the wizard was used to choose a priority for the restore job. Job priority determines which job runs first (typically, restore jobs are set higher than backup jobs). As the last step in the restore wizard process, the destination for the restore job was chosen.

FIGURE 11. INDIVIDUAL INBOX RESTORED

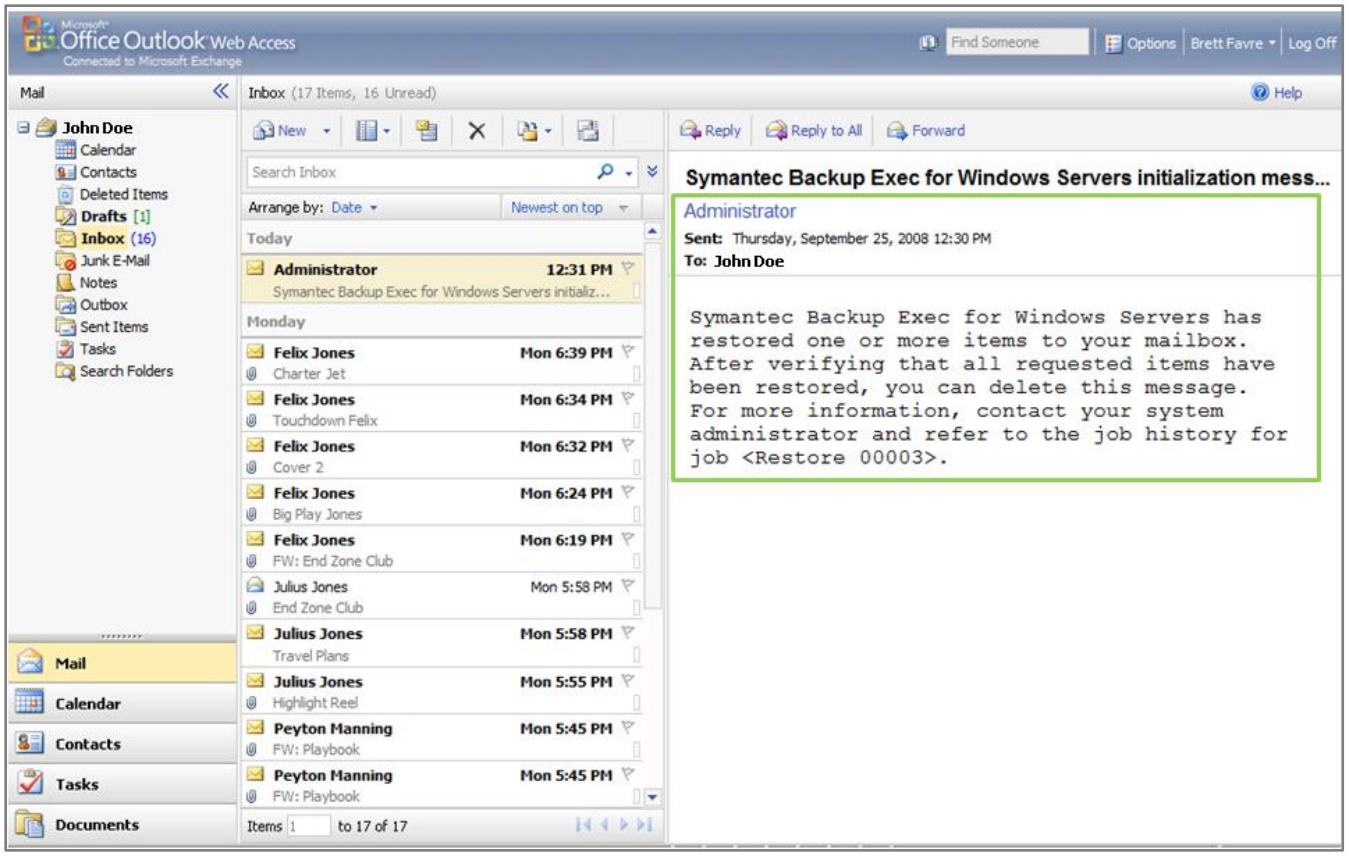


Figure 11 displays the restored Inbox. ESG Lab noted a message from Backup Exec, which explained that one or more items had been restored to the mailbox. The wizard-driven restore of a deleted Inbox was effortless and completed in less than two minutes.

Why This Matters

As e-mail has evolved from an alternative communications medium to an indispensable business tool, applications such as Microsoft Exchange have been elevated to mission-critical status within most organizations. Keeping Microsoft Exchange data available for all users at all times can be a huge challenge–particularly for small to medium-sized businesses that often lack full-time IT staff.

The Dell PowerVault DL2000 Powered by Symantec Backup Exec with Granular Recovery Technology delivers quick and easy disk-based backup and recovery of Microsoft Exchange data. ESG Lab found that it is extremely easy to configure and manage Microsoft Exchange backups. Individual messages and mailbox restores can be completed in minutes instead of hours compared to traditional methods which require a full restore.

Protecting Virtual Servers

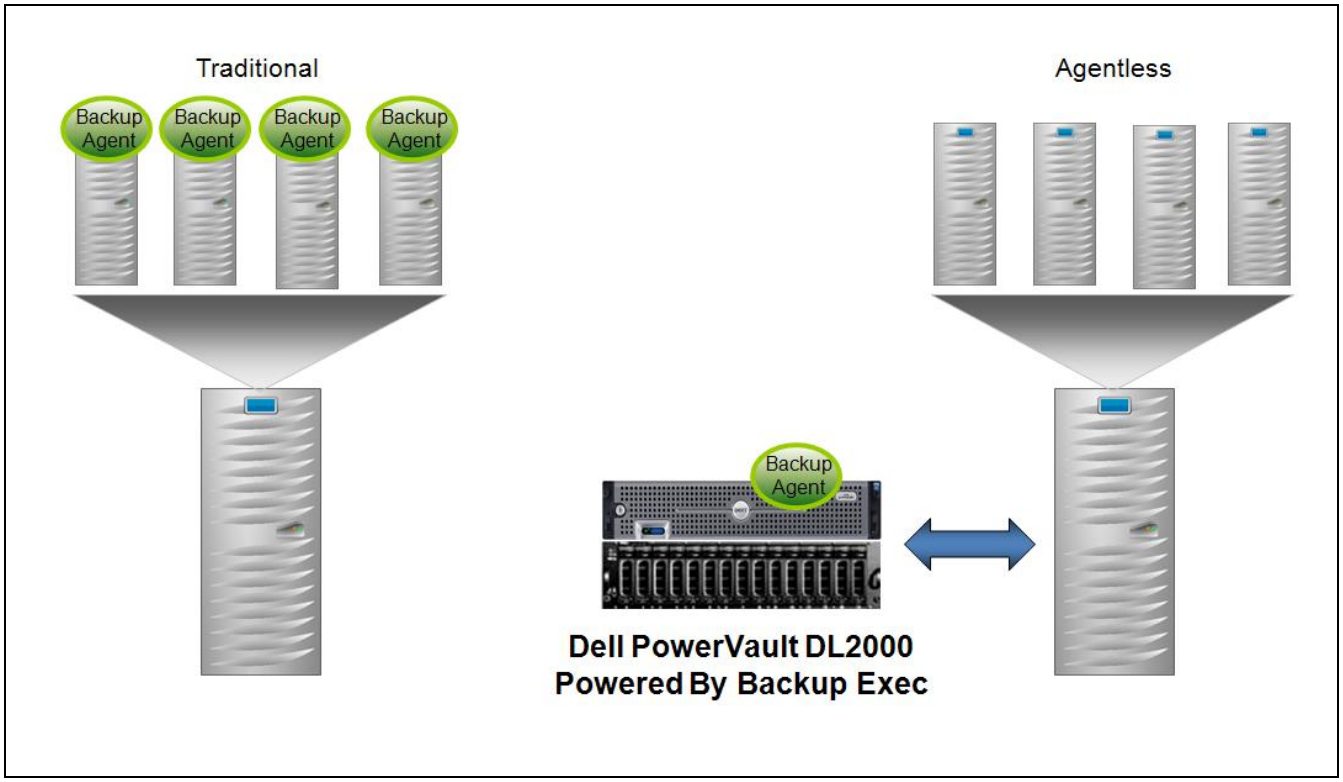
By its definition, server virtualization centralizes processing power within a data center. As a result, it is imperative that these assets are properly protected, especially as this technology is becoming part of the mainstream production environment. This presents a unique challenge for IT because the virtual servers—inclusive of their operating systems and the data that they access—must be backed up and protected.

The problem is that most data protection applications have often treated virtualized server environments as physical environments. By doing so, backup applications require backup agents to be loaded onto each virtual server. This traditional practice of placing backup agents on the virtual machine can put extra load on the server, which impacts performance. Additionally, the cost of agents for each virtual machine can quickly add up.

The Backup Exec agent for VMware Virtual Infrastructure can be used to protect an unlimited number of VMware virtual guest systems. The agent can also restore individual files and folders from a single image-level backup using Backup Exec's Granular Recovery Technology (GRT).

As shown in Figure 12, the traditional method of placing agents on each virtual machine, depicted on the left, is compared to the Backup Exec approach on the right. The backup agent running on the PowerVault DL2000 works in concert with the VMware Consolidated Backup (VCB) proxy server and VMware Converter to provide backup and recovery services for virtual machines while it eliminates the complexity and overhead of managing agents running in virtual machines.

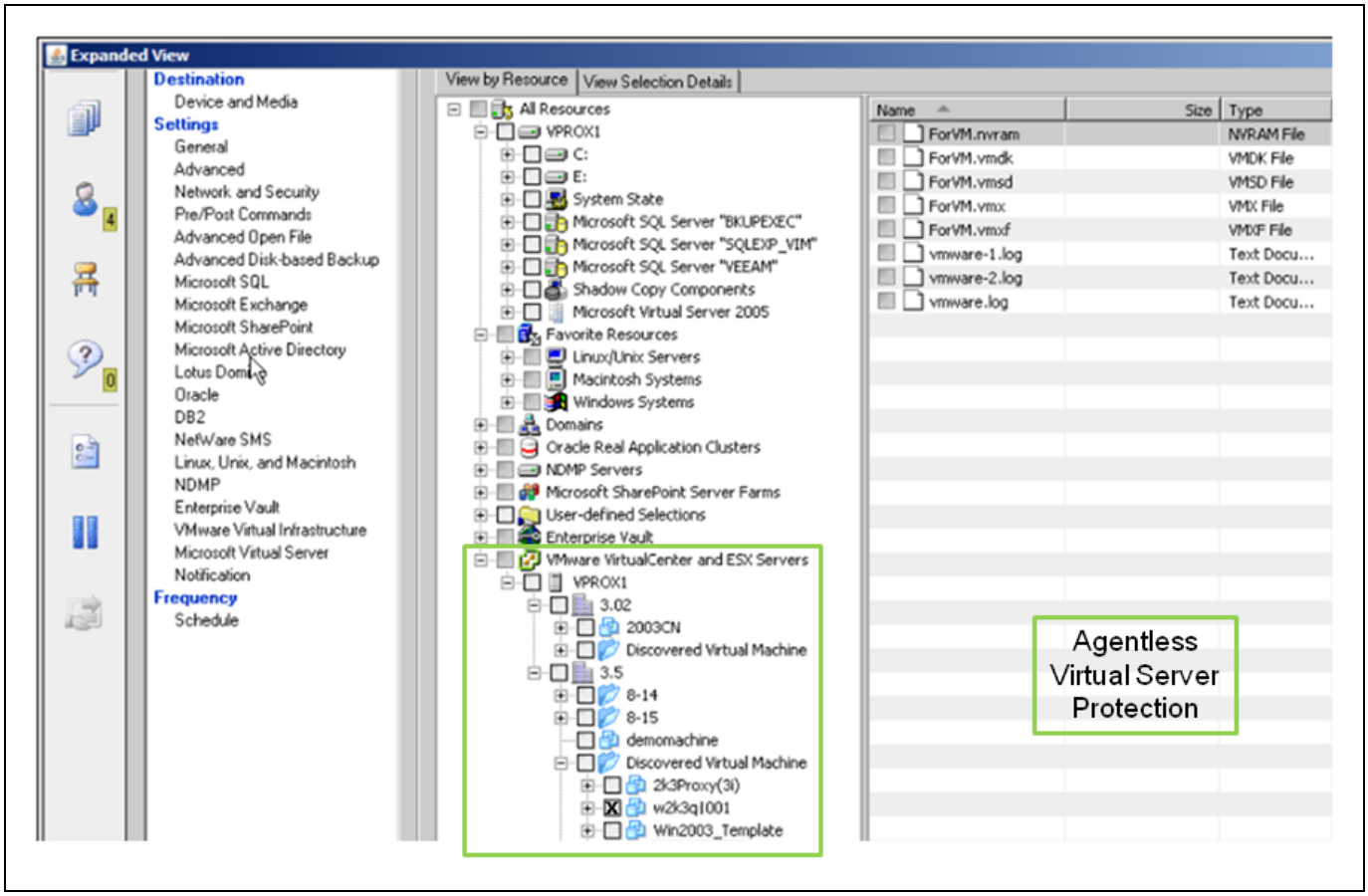
FIGURE 12. TRADITIONAL VS. AGENTLESS VIRTUAL SERVER PROTECTION



ESG Lab Testing

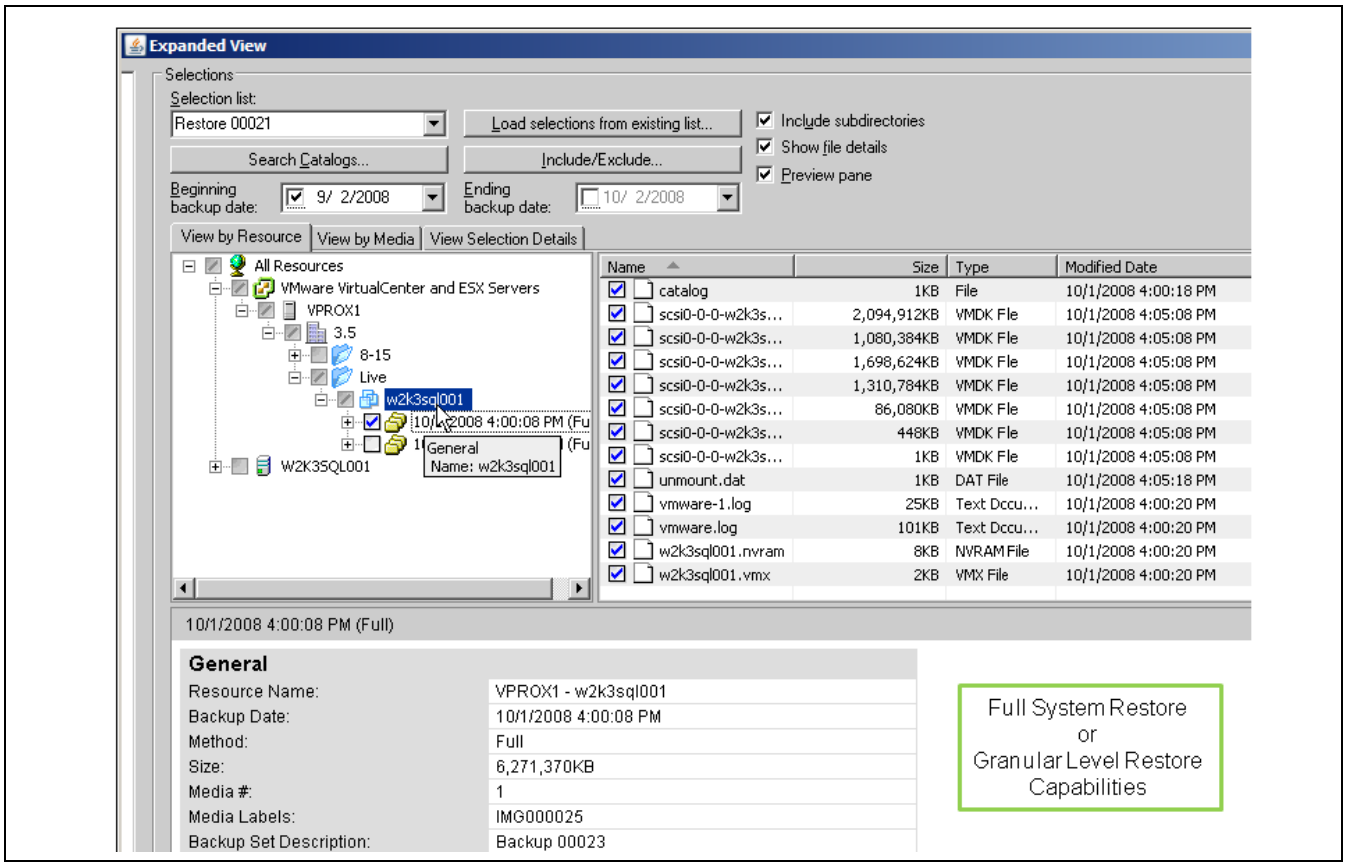
ESG Lab performed full image backups of a virtual server on a VMware ESX server using the Backup Exec Agent for VMware Virtual Infrastructures with Backup Exec's Granular Recovery Technology installed and enabled. As shown in Figure 13, ESG Lab selected the virtual server w2k3sql001 for backup.

FIGURE 13. BACKING UP A VIRTUAL SERVER



Once the virtual server (w2k3sql001) was backed up, ESG Lab performed a series of successful restore operations. Figure 14 shows the explorer-type user interface that was used to perform file level restores.

FIGURE 14. RESTORING A VMWARE VIRTUAL SERVER



Why This Matters

From a data protection perspective, server virtualization centralizes more of the processing power within a data center, which makes it even more imperative that organizations protect these assets. Doing so presents a unique set of operational challenges, including the protection of growing volumes of data residing within virtual machines. In fact, ESG research found that more than one-third (37%) of current users report that the total amount of data they need to back up has increased with the deployment of server virtualization.[4]

ESG Lab has validated the Dell PowerVault DL2000 powered by Backup Exec provides quick and easy disk-based protection of operating system and application data residing in virtual machines. Backup Exec with Granular Recovery Technology (GRT) lets backup administrators restore individual drives, files, and folders without having to restore an entire virtual machine. This provides faster time to recovery as it eliminates the cost and overhead of backup agents installed on every virtual machine.

[4] Source: ESG Research Report, *The Impact of Server Virtualization on Storage*, December 2007

Safeguarding Desktops/Laptops

Protecting distributed data is a challenge for small to medium-sized organizations. While data residing on servers is usually protected, data residing on desktops and laptops is often at risk. Users are often required to copy their files to a network share to ensure that their data is included in scheduled server backups. This manual, ad-hoc process leaves data vulnerable to loss. It also increases the burden on IT, as employees need to seek technical help when a recovery is required.

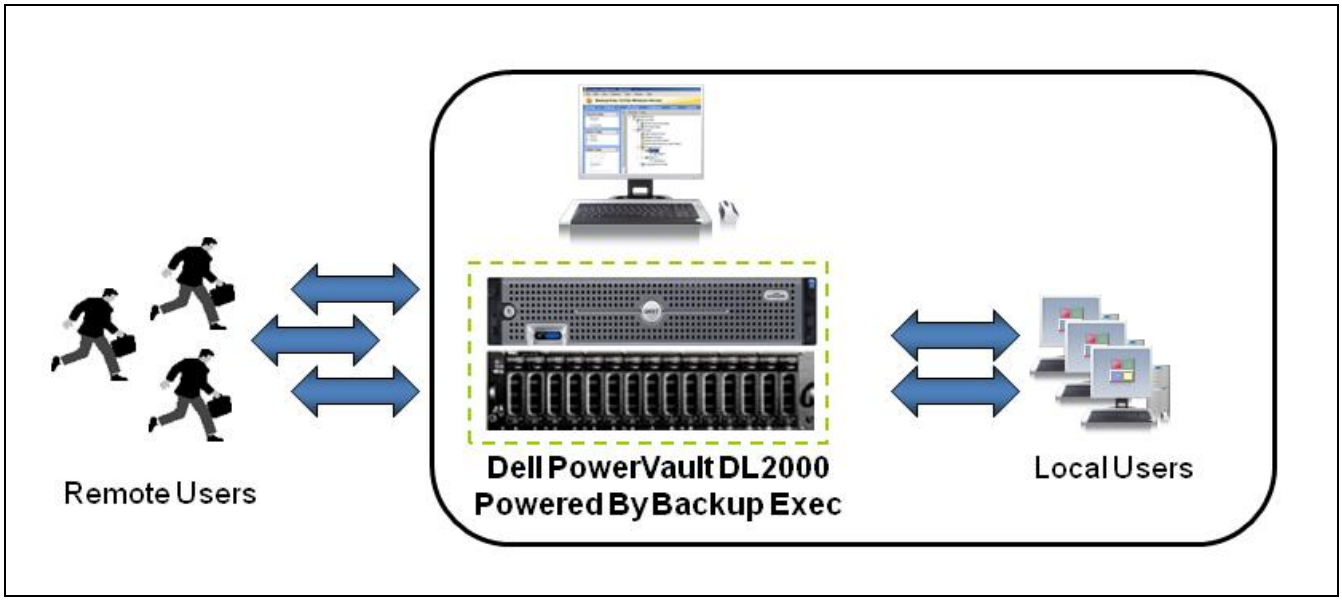
An increasingly mobile workforce is also compounding this problem. Traveling or telecommuting executives cannot be relied upon to comply with the manual copying of files, especially if they are infrequently connected to the company network. Considering the types of information carried in a typical laptop—proposals, contracts, customer data, budgets, internal memos, etc.—protecting data against accidental deletion, corruption from viruses, hardware failure, and theft can no longer be ignored. For most travelling executives, the laptop has become the briefcase—everything that matters is in it.

Symantec's Backup Exec Desktop and Laptop Option delivers continuous data protection of desktops and laptops—whether users are in the office, working from home, or traveling on the road. The desktop agent enables end-users to perform self-service restores and maintain synchronization between multiple desktops and laptops, ensuring that all up-to-date file versions are available on all of a user's computers. Search and retrieval of a user's data can be performed via the Backup Exec Retrieve interfaces accessed through a web browser or a local U/I on the user's computers.

Backup Exec protects computers whether they are connected to the network or offline. When the system is not connected to the network, files are backed up to a local data folder on the desktop. When the computer reconnects to the network, the files are automatically backed up from the local folder to the Dell PowerVault DL2000 backup to disk appliance.

Figure 15 shows how data residing on remote and local desktops can be protected by the PowerVault DL2000 Powered by Backup Exec with the Desktop/Laptop agent—no matter where the user is currently located.

FIGURE 15. PROTECTING DESKTOPS & LAPTOPS

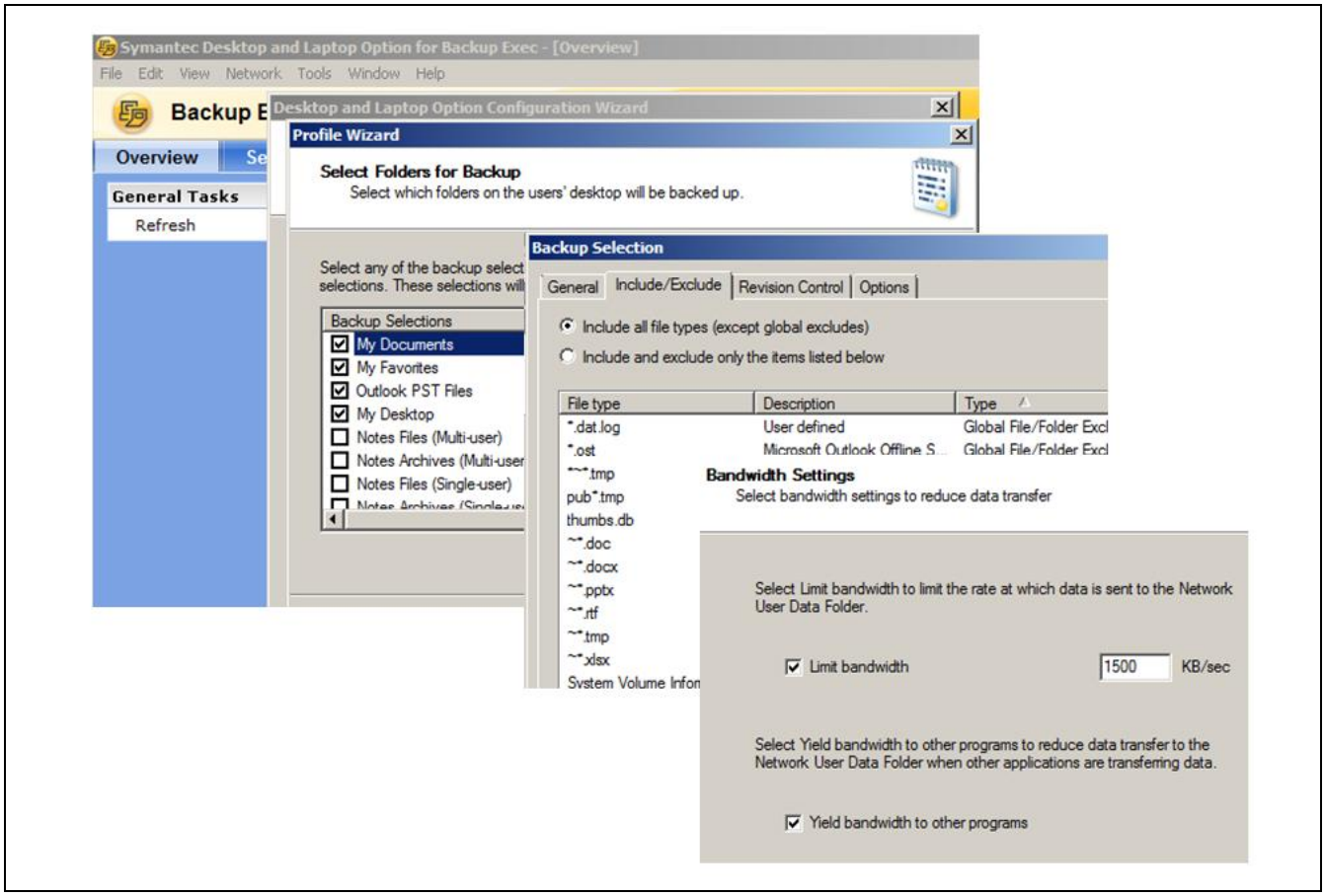


ESG Lab Testing

ESG Lab began testing by installing the desktop agent using Backup Exec's push-install capability. The push-install process was configured by simply supplying the network address and user credentials for a simulated remote user's PC. The agent was automatically started on the desktop computer in less than two minutes without requiring a system reboot.

Once the agent was running, a desktop and laptop profile wizard was used to define the backup policies. The wizard was used to select the folders to protect, the file types to include or exclude, and the maximum network bandwidth that would be used as shown in Figure 16.

FIGURE 16. CREATING A BACKUP POLICY



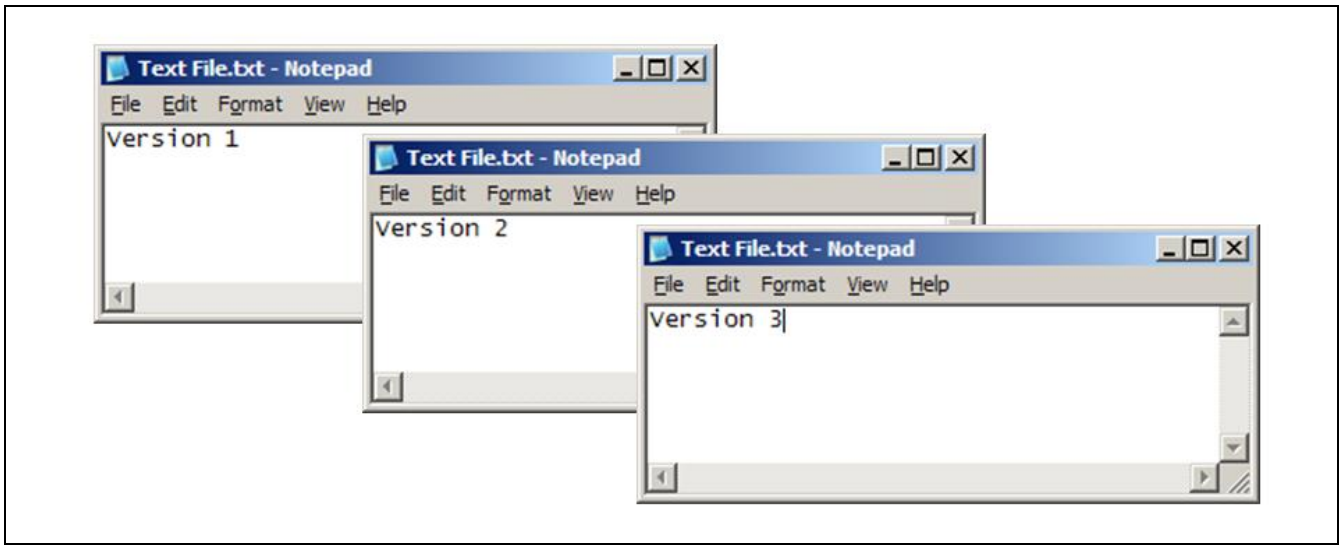
My Desktop, My Documents, and My Favorites folders and Outlook PST files were selected for backup. Files with a .jpg extension were tagged for exclusion and the bandwidth limit was set to 1,500 KB/sec. A first full backup was run. ESG Lab confirmed by visual inspection that the data that was backed up was in accordance with the just-defined backup profile.

The Backup Exec Desktop and Laptop Option supports file versioning. When a file is changed and backed up, Backup Exec stores the changed file as a 'revision.' Revisions are versions of a file at a specific point in time. Backup Exec stores and maintains a specific number of revisions for all files in a backup selection based on the backup profile.

ESG Lab tested Backup Exec's file versioning ability in a series of tests designed to simulate a user creating and editing a document over the course of a normal day. ESG Lab set the policy for this test to automatically protect files on a simulated desktop user's machine whenever a file changed.

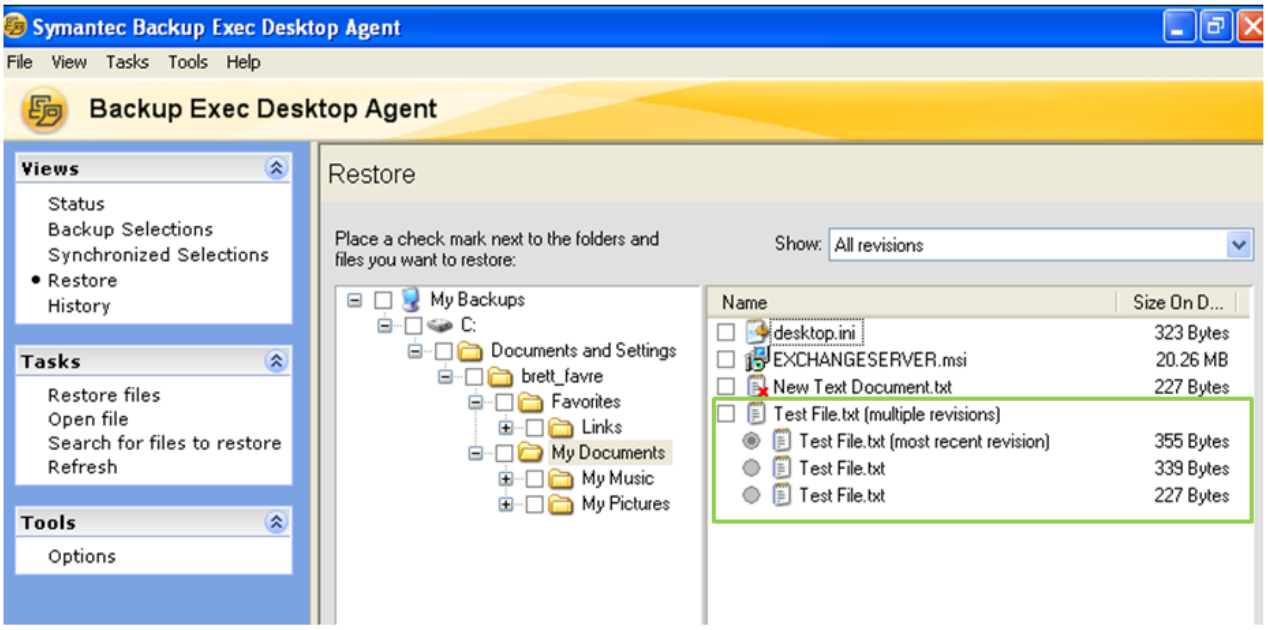
A text file containing the string "Version 1" named "Test File.txt" was created and saved in the My Documents folder. The file was edited and saved two more times to create three versions of the file as shown in Figure 17.

FIGURE 17. CREATING MULTIPLE VERSIONS OF A FILE



ESG opened the Backup Exec restore dialog and verified that the Backup Exec agent had backed up each version of the file automatically. As seen in Figure 18, three versions of the file were backed up, with the most recent version identified.

FIGURE 18. RESTORING SPECIFIC FILE VERSIONS



ESG Lab restored each version of the file in turn to the original folder and confirmed that the correct version had been restored in each case. In a matter of seconds, each version of the file was restored to its original location.

Why This Matters

Today's desktop or laptop is like a briefcase. If it is lost or stolen, the replacement cost is less of a concern than the value of its contents or the productivity loss associated with recovering the data inside the virtual briefcase. Traditional methods for backing up these virtual briefcases can be cumbersome and often fail. As a matter of fact, an ESG survey of small to medium-sized businesses indicates nearly one out of every six (16%) of attempted restores fail. Backup Exec's Desktop and Laptop option offers an insurance policy to protect vital information assets residing on laptops and desktops.

As an administrator, ESG Lab found that the push-install configuration of Symantec Backup Exec Desktop/Laptop agents is fast and intuitive. As an end-user, ESG Lab found that the Symantec Backup Exec Retrieve provides an intuitive web-driven interface for self-restore operations. ESG Lab also found that the optional ability to restore each saved version of a file is easy to use and extremely valuable.

ESG Lab Validation Highlights

- ☑ The DL2000 was shipped with pre-installed Microsoft Windows 2008 and Symantec Backup Exec software.
- ☑ The Backup to Disk appliance was protecting data within 20 minutes from the first keystroke.
- ☑ Protecting and recovering servers and applications was easy and intuitive.
- ☑ The DL2000 appliance provided a centralized platform for hands-free continuous data protection.
- ☑ Restoring individual files from the intuitive wizard-driven user interface was quick and easy.
- ☑ Backup Exec's agentless VMware integration provided data protection for an unlimited number of virtual machines on a VMware ESX host.
- ☑ Using Symantec's Backup Exec Granular Recovery Technology, ESG Lab was able to restore individual files and e-mails seamlessly and quickly.
- ☑ ESG Lab was able to recover individual files from a VMware VCB backup image without having to restore the entire virtual machine.
- ☑ Protecting desktop and laptop data using automated push-install technology was easy to deploy and manage.
- ☑ An intuitive web-driven interface provided an easy method for end-users to run their own restore operations.
- ☑ The ability to restore each saved version of a saved file is intuitive and valuable.

Issues to Consider

- ☑ Automatic storage provisioning is only supported with the factory installed and add-on MD1000 disk shelves populated with factory SATA drives. If a user wants to provision any other storage for use with the DL2000, it must be done manually.
- ☑ While the manual installation and configuration of agents was straightforward, customers would benefit from automatic discovery of networked applications and installation of agents.
- ☑ In order to support granular file-level restore directly to virtual machines on Microsoft or VMware virtual server infrastructure, the Backup Exec agent must be installed on these systems. Individual files and folders can be recovered directly to the DL2000 if customers do not wish to install an agent inside a virtual machine.

ESG Lab's View

As data protection demands on SMBs increase, the shortcomings of legacy traditional tape-based backup and recovery solutions become more apparent. According to ESG research, small businesses report problems with backup and recovery performance, reliability issues (due to media failure, human error, and hardware failure), tape management headaches, and high administrative costs. ESG interviewed nearly 400 storage professionals and found that 14% of their tape-based backup operations did not complete successfully within their backup window; more importantly, nearly 1 in 6 of their recovery attempts failed. Translate these failures into dollars lost based on unrecoverable data and clearly, the impact is potentially financially devastating to small businesses.[5]

As a result, many SMBs have implemented data protection solutions that have either been too big for their environments with the hope that they will grow into them or that have been grossly inadequate given today's increasingly demanding business climate. The combination of Dell and Symantec, both leading vendors in their respective markets and trusted suppliers to small businesses, has created a powerful, easy to deploy and manage disk-based data protection appliance.

With increasingly complex data protection environments, many organizations express interest in turning to one vendor for all of their data protection needs—but also recognize that they may need to select best-of-breed products to fully address their requirements. Roughly one-quarter (23%) of small to medium-size businesses surveyed by ESG indicate they are very likely to look to a single vendor to support the full spectrum of their organization's data protection processes. Sold and supported by Dell, a vendor that small and medium-sized businesses have come to know and trust, the PowerVault DL2000 fits these requirements perfectly.

The Dell PowerVault DL2000 Powered by Symantec Backup Exec addresses the challenges of small and medium-sized businesses with a backup to disk solution that ESG Lab was able to configure in less than 20 minutes. ESG Lab has confirmed that Dell and Symantec have created an affordable, integrated solution that is easy to order, install, and own as it provides fast and reliable protection and granular recovery of mission-critical application data using the latest in disk-based continuous data protection technology.

[5] Source: ESG Research Report, *Data Protection Market Trends*, February 2008

Appendix

TABLE 1. TEST CONFIGURATION

Hardware	Software
Dell PowerVault DL2000 - CPU – 2 x 2.33 GHz Quad core Xeon - Memory – 8GB - Storage – MD1000 with 8 – 500 GB SATA drives - OS – Windows 2008 Standard Edition	Symantec Backup Exec 12.5 - Exchange Agent - VMware Virtual Infrastructure Agent - Desktop/Laptop Agent
Dell PowerEdge 2950 - CPU - 2 x 2.33 GHz Quad core Xeon - Memory – 8 GB Ram - Internal Storage: 2 x 250GB SAS RAID0	Windows Server 2003 x64 Microsoft Exchange 2007 (15GB capacity) (7GB Logs; 8 GB Database)
Dell PowerEdge 6850 – SAN attached - CPU – 2 GHz Quad Core Xeon - Memory – 16 GB Ram - HBA – Qlogic	VMware Virtual Infrastructure ESX Server 3.5 Update 2 VCB Version 1.5 VMware Converter 3.03 Virtual Center 2.5 Guest OS – Windows Server 2003 SP2

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