ESG Lab Review

Protecting Virtual Environments with Symantec Backup Exec 2014

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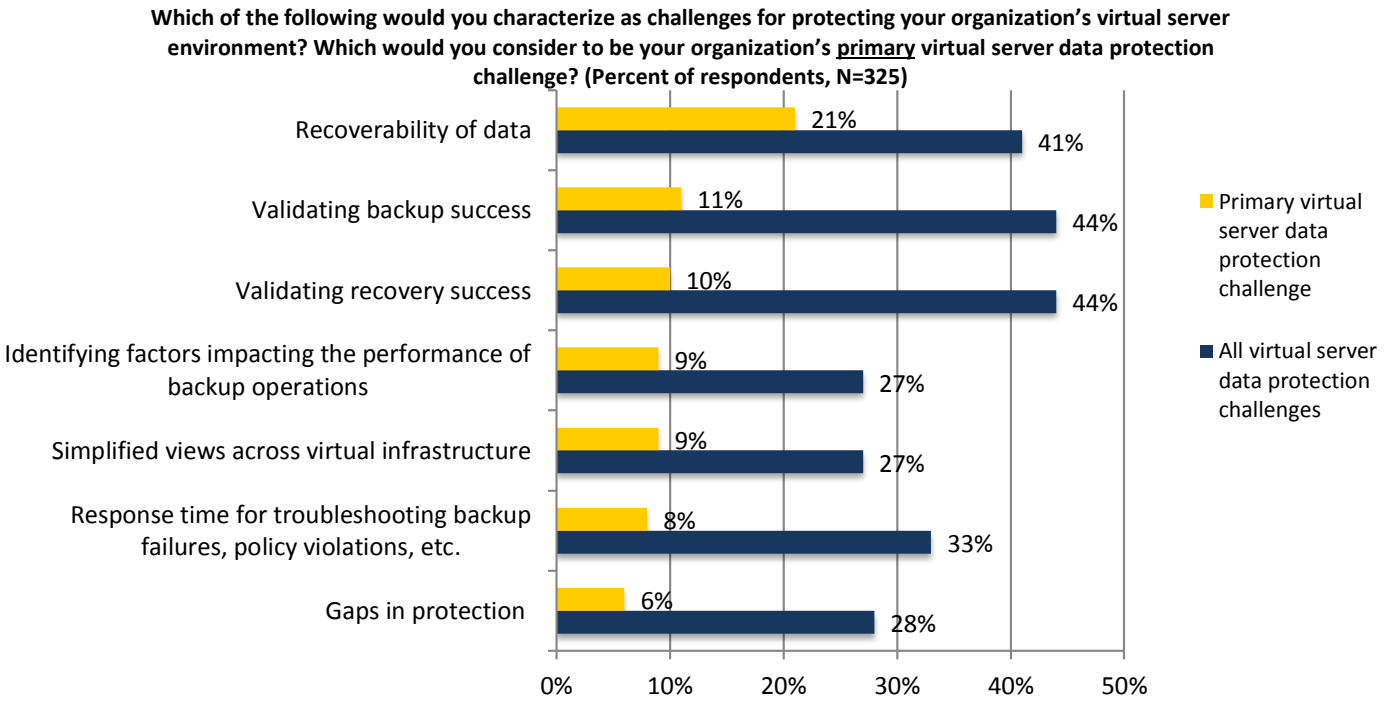
Abstract: *This ESG Lab review documents hands-on testing of Symantec Backup Exec 2014, with a focus on ease of management and flexible recovery options for virtual machine backups.*

The Challenges

Server virtualization has become a mainstream deployment due to its proven benefits: physical server consolidation, cost reduction, efficiency, and flexibility. However, it can throw a monkey wrench into data protection processes. Backup administrators must manage physical and virtual servers, consolidated workloads, and multiple hypervisors—while often lacking virtualization skills and training, according to ESG research respondents. [1] In addition, the ease of spinning up new VMs can leave administrators unaware of unprotected assets, resulting in data vulnerabilities.

ESG recently asked IT professionals at both midmarket and enterprise organizations about their challenges in protecting virtualized environments. In terms of all virtual server data protection challenges, the ability to validate both backup and recovery success topped the list, closely followed by recoverability of data (see Figure 1).[2] Other top challenges included response times for troubleshooting, gaps in protection, and simplified views across the virtual infrastructure. When asked about the primary challenge, recoverability and validating backup and recovery success topped the list.

Figure 1. Top Seven Challenges of Protecting Virtual Server Environments



Source: Enterprise Strategy Group, 2014.

Ultimately, administrators of varying skill levels need solutions that not only ensure proper protection for all virtual server data, but also enable them to quickly and easily monitor data protection status and tasks.

[1] Source: ESG Research Report, *Trends for Protection Highly Virtualized and Private Cloud Environments*, June 2013.
[2] Ibid.

The Solution: Backup Exec 2014

Backup Exec 2014 is a full-featured backup and recovery solution for both virtual and physical environments. It supports VMware and Hyper-V as well as Windows, Linux, and Macintosh environments, and includes full support for Windows Server 2012/2012 R2. Key features include:

- Faster performance.
- Image-based backups for VMware and Hyper-V.
- Easy implementation, usage, and management.
- Fast, versatile backup and restore options, including:
  - Catalog-assisted granular recovery of objects, files, folders, applications, or VMs (including Exchange, SharePoint, SQL Server, and Active Directory) directly from storage, with no mounting or staging.
  - Restore to different targets or hardware.
  - Restore to physical or virtual servers.
- Backup to disk, tape, or cloud regardless of location.
- Integrated block-level data deduplication—client, media server, or OST appliance.

Powerful

Backup Exec 2014 offers faster backups, flexible backup methods, and the ability to monitor recovery success. An updated deduplication engine adds to the performance improvement. In addition, each virtual backup stream can be split into multiple streams, shrinking the time required as writes don't have to wait for reads to complete. These are key to managing the growing number of VMs that need protection while minimizing downtime and disruption; completing backups within the backup window; and achieving recovery time objectives (RTOs). A multi-hypervisor protection solution, Backup Exec 2014 is integrated with VMware vCenter and VMware APIs for Data Protection (VADP), as well as Microsoft Hyper-V and VSS.

Integrated deduplication reduces data volumes to minimize storage requirements. Backup Exec 2014 leverages VMware's change block tracking feature (CBT), Windows Change Journal, and Symantec CBT for fast incremental/differential backups and efficient deduplication. Global deduplication helps to ensure maximum savings by eliminating duplication across all protected volumes.

Flexible

Backup Exec 2014 offers multiple backup and restore options, including restore from any full or incremental point in time. Backup Exec 2014 was designed to support virtual, physical, or hybrid environments from a single management console, eliminating the cost and complexity of point solutions.

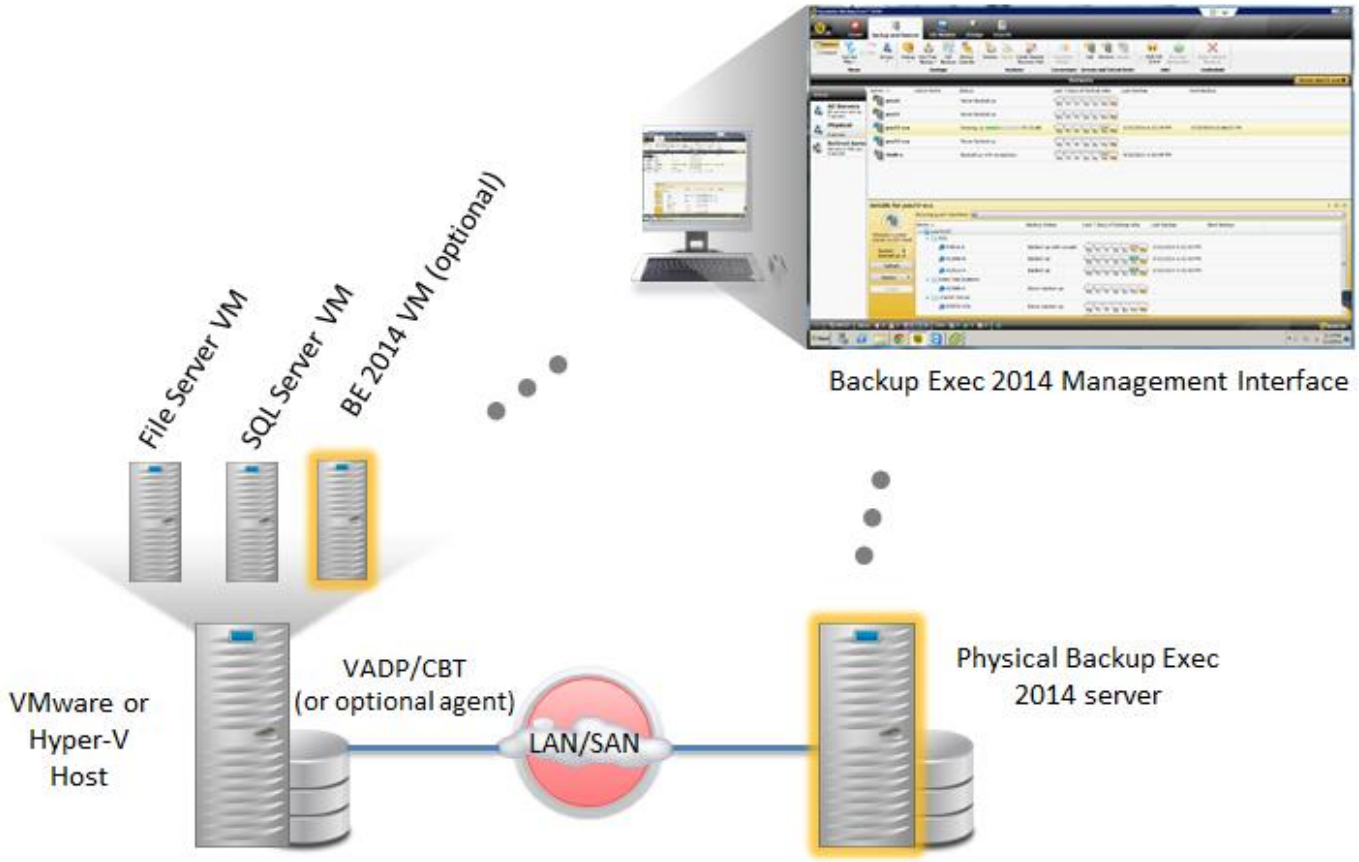
- Agentless backup provides recovery of complete VMs, while optional agents (for coordination only, not data movement) enable granular recovery using Symantec Granular Restore Technology (GRT). This enables IT to quickly recover only the data needed without having to restore entire volumes.
- The workflow makes it simple to convert a running physical machine to a VM during the backup process (P2V), restore a VM to a physical host (V2P), and restore a backup directly to a VM (B2V). These features are useful for disaster recovery as well as workload migration.

Easy to Use

Backup Exec 2014 includes all the functionality that customers have counted on for many years, with simplified, centralized views across the physical and virtual environment. Management is simple and fast using dashboards and wizards. The interface includes the job monitor as well as server-centric management. A single backup job can be used to back up and manage multiple servers. The "stages" method uses intuitive wizards with which IT can set up multi-step backup jobs in just a few mouse clicks. In addition, Backup Exec 2014 automatically detects and protects new VMs that come online or are created/cloned, ensuring that all data is safe. A free VMware plug-in enables full monitoring capability through vCenter.

Figure 2 shows an overview of Backup Exec 2014. On the left are VMware or Hyper-V servers hosting multiple virtual machines, including a virtual file server, SQL Server, and an optional Backup Exec VM. The Backup Exec server can be physical (as shown on the right) or virtual. In the upper right is the Backup Exec 2014 management interface.

Figure 2. Backup Exec 2014 Solution Overview



ESG Lab Tested

ESG Lab performed hands-on testing of Backup Exec 2014 via remote log-in. Testing was focused on simple, intuitive management and flexible recovery options for virtual backups.

Simple, Intuitive Management

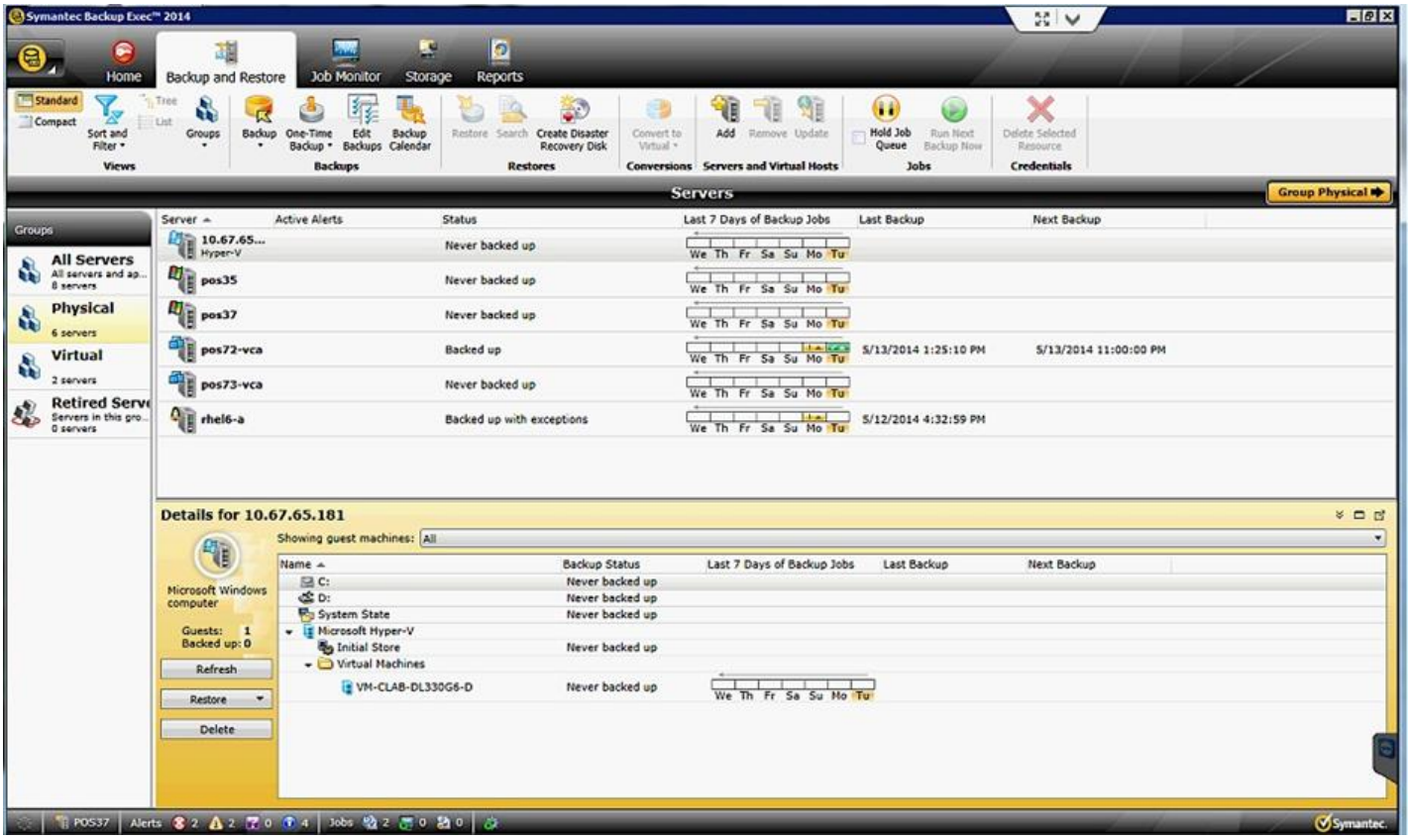
ESG Lab began by exploring the management interface. Backup Exec 2014 has combined the best of its previous GUI features so that administrators can take advantage of both the server-centric and the job-centric views. These options enable IT to tailor the management experience to accommodate particular workflows, applications, and administrators.

Figure 3 shows backup status details for each server in the environment via the Backup and Restore tab. This tab enables administrators to manage all activities from a single screen. From the ***Groups*** navigation pane on the left, ESG Lab clicked on the ***Physical*** group, and the physical servers were displayed in the top pane. The servers shown include a Hyper-V host with a blue Windows logo indicating that it is hosting at least one VM. Other servers include two physical Windows servers, two VMware hosts containing VMs, and one physical Linux server. For each server, administers can view current backup status, the success or failure of the past week's backup jobs, and the times of the last and next backups.

The bottom pane shows details of the Hyper-V host that is highlighted in the top portion. In the yellow portion of the screen, ESG Lab could see at a glance that there was one guest VM, and that it had never been backed up. The detail screen displayed backup status and history for the VM.

It should be noted that Backup Exec 2014 will automatically discover any virtual or physical servers in the domain, and can be configured to automatically back up what it discovers. This prevents organizations from having stranded assets that remain unprotected.

Figure 3. Backup and Restore Tab

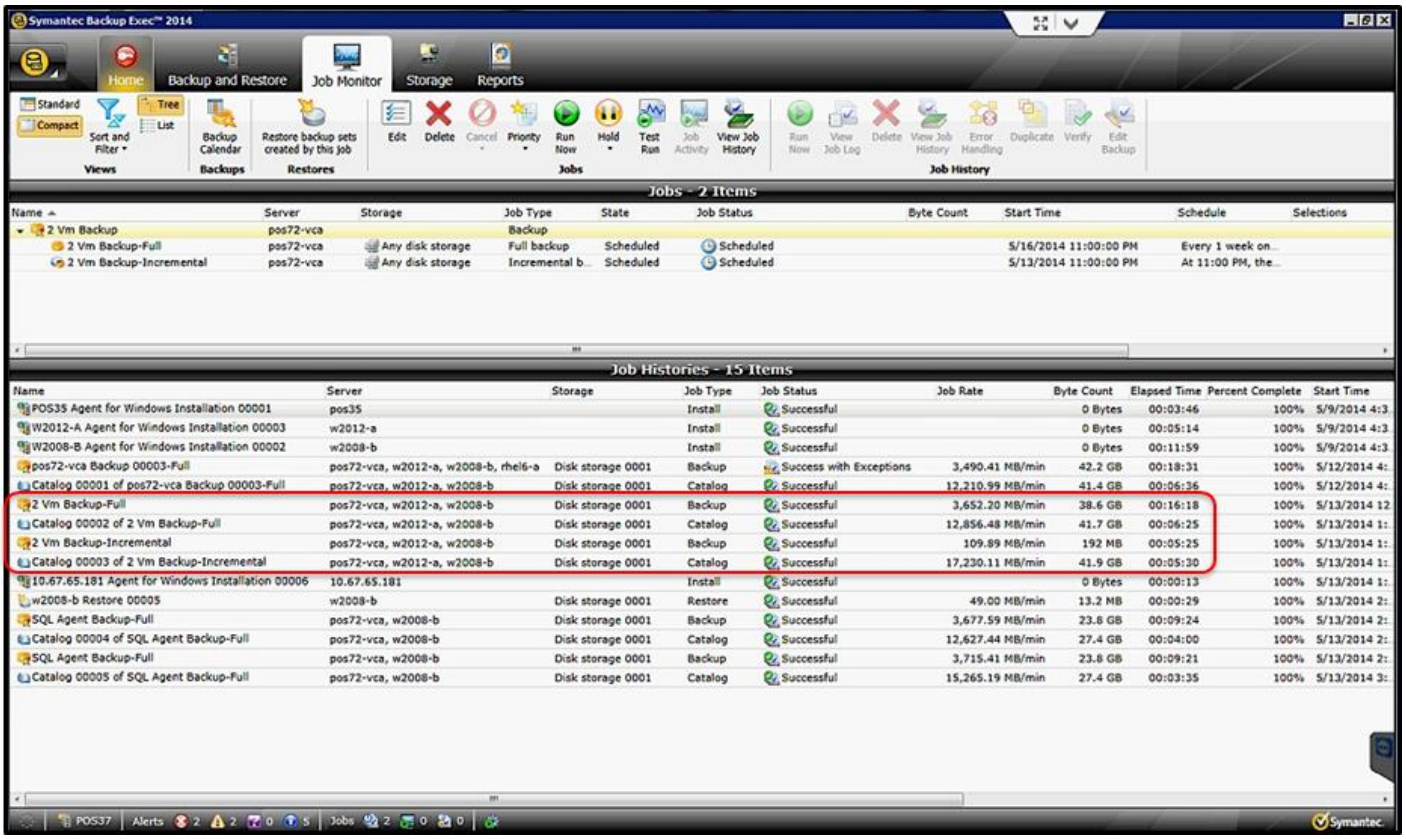


Next, ESG Lab created a backup job for two VMware VMs (***w2012-a*** and ***w2008-b***) on the ***pos72-vca*** host, and named the job ***2 Vm Backup***. Using the workflow, the Lab created, scheduled, and executed both full and incremental backups. Figure 4 shows the Job Monitor view. The top portion of the screen shows the job highlighted, including details about the scheduled full and incremental backups. Details include the storage target, job type, current state, and schedule details.

The bottom portion of the screen displays the job history and details, including servers, storage, type of job, and status; administrators can click on each job for more detail. For example, the status of one backup job was listed as "Success with Exceptions." IT can drill down on that specific job to discover what the exceptions were. In addition, this screen shows the throughput rate, byte count, and elapsed time for each job.

When multiple servers are selected for a backup job, Backup Exec 2014 presents a dialog box with the option to create a single job with multiple servers, or to create individual jobs. This option enables administrators to create the workflow that is most effective for the particular job.

Figure 4. Job Monitor



Delayed Catalog Option

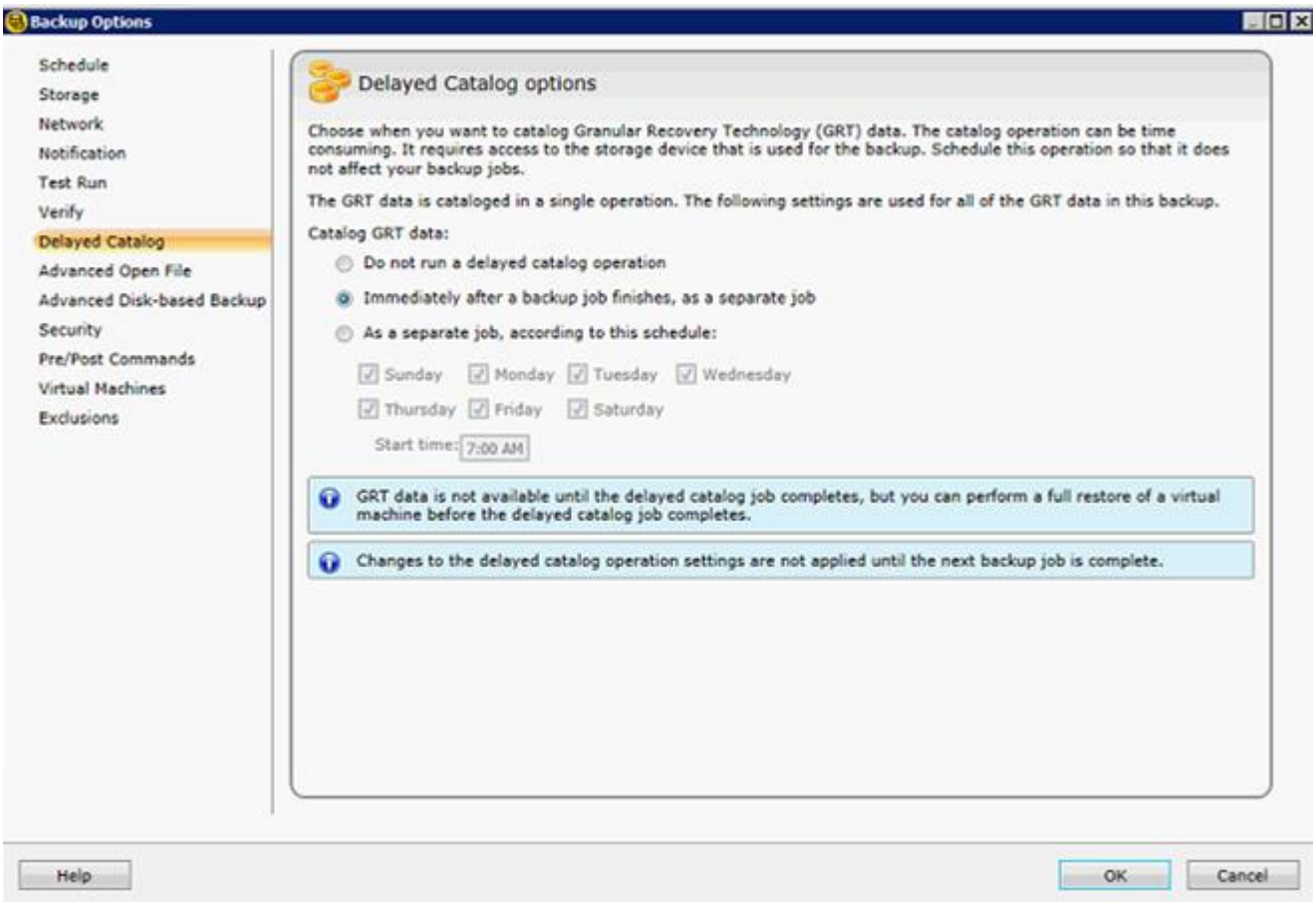
The catalog portion of the backup enables granular recovery, letting IT recover individual files or application objects instead of having to restore an entire volume to recover a single file. With Backup Exec 2014, Symantec provides the option to make the catalog backup a separate task, and to delay that task for up to a week. This enables organizations to speed their backups and save cataloging for later, ensuring that backups are completed within the backup window and don't interfere with production operations. A granular restore must wait for the catalog backup, but a full restore can be executed without it, so using the delayed catalog option does not make the data vulnerable. Multiple delayed catalogs can be configured for datasets that will be backed up multiple times within the week.

Highlighted in the red box in Figure 4 are details of the initial ***2 Vm Backup*** job, which was configured with the catalog backup as a separate job to run immediately after data backup. The jobs are separated out into four tasks: full data backup; catalog backup; incremental backup; and incremental catalog backup.

The elapsed time column in Figure 4 indicates that the catalog portion of the task consumes some time. Adding the times together provides the complete time for each backup job; in this example, the data portion of the full ***2Vm backup*** took 16:18, while the catalog portion took 6:25, for a total of 22:43 seconds. The incremental backup took 5:25 + 5:30 = 10:55.

In this case, the delayed catalog option would move almost 25% of the full backup time, and 50% of the incremental backup time, to a more convenient window, while still enabling granular recovery of files' application objects. Figure 5 shows the Delayed Catalog options screen.

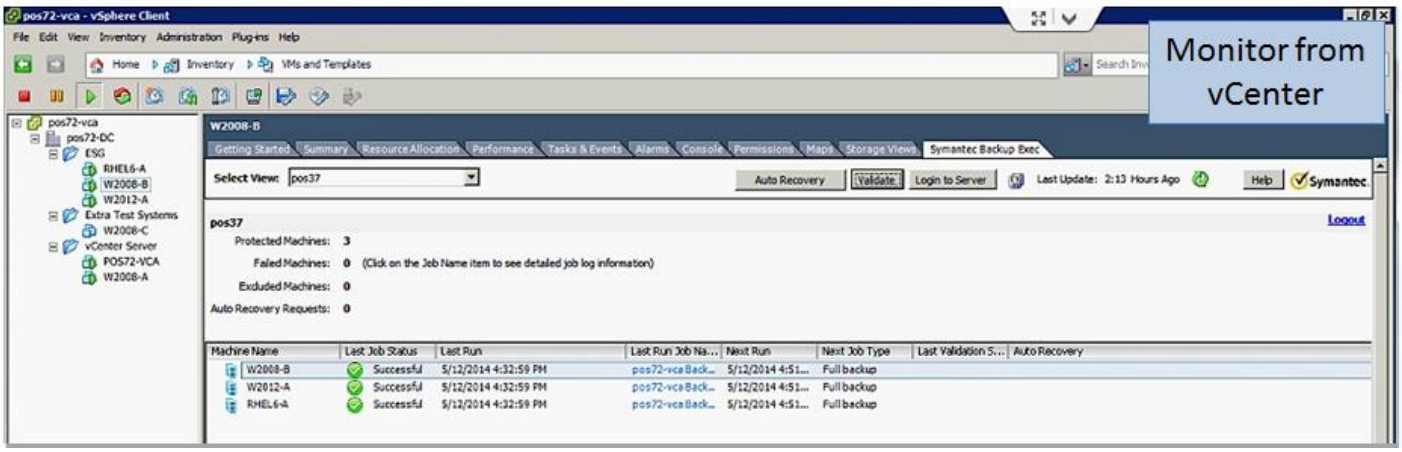
Figure 5. Delayed Catalog Options



Finally, ESG Lab explored the additional monitoring options that Backup Exec 2014 provides. The top screen in Figure 6 shows the Jobs view, displaying all the jobs for the server ***pos72-vca***. Several backup jobs and their details are listed, and the ***2 Vm Backup-Full*** job is highlighted. From this screen, the administrator can click on a job and execute backup, restore, and other tasks.

Backup Exec 2014 incudes a free vCenter plug-in to enable monitoring of virtual machines. The bottom of Figure 6 shows the view from vCenter. The left navigation shows the ***pos72-vca*** host and the ESG folder containing three VMs: ***RHEL6-A***, ***W2008-B***, and ***W2012-A***. On the right are a summary screen at the top, and individual VMs listed on the bottom along with their job status and details.

Figure 6. Jobs View and VMware vCenter View



Why This Matters

According to ESG research respondents, business process improvement and reduction in operational expenditures were tied as the second most-cited considerations for justifying IT investments to business management.[3] Making it simpler and faster to ensure that the virtual environment is properly protected and enabling administrators to easily view the status of VM backups help organizations save both time and money.

ESG Lab confirmed that Backup Exec 2014 is easy to use, with an intuitive GUI. Data protection status and history are viewable at a glance. Data protection tasks can be managed using a job-centric or server-centric view, with drill down capabilities for individual jobs. The Lab created a workflow for full and incremental backups and found it extremely easy to set up, manage, and track. The Delayed Catalog option provides additional flexibility to prioritize backup speed if needed, and the vCenter plug-in enables monitoring of the virtual environment from a single screen.

[3] Source: ESG Research Report, *2014 IT Spending Intentions Survey*, February 2014

Flexible Recovery Options

Backup Exec 2014 offers full and incremental recovery from any point in time, with options to restore to dissimilar hardware or hosts, and enables P2V, V2P, and B2V. These options enable organizations to not just protect data and provide disaster recovery, but also maximize asset utilization and migrate workloads.

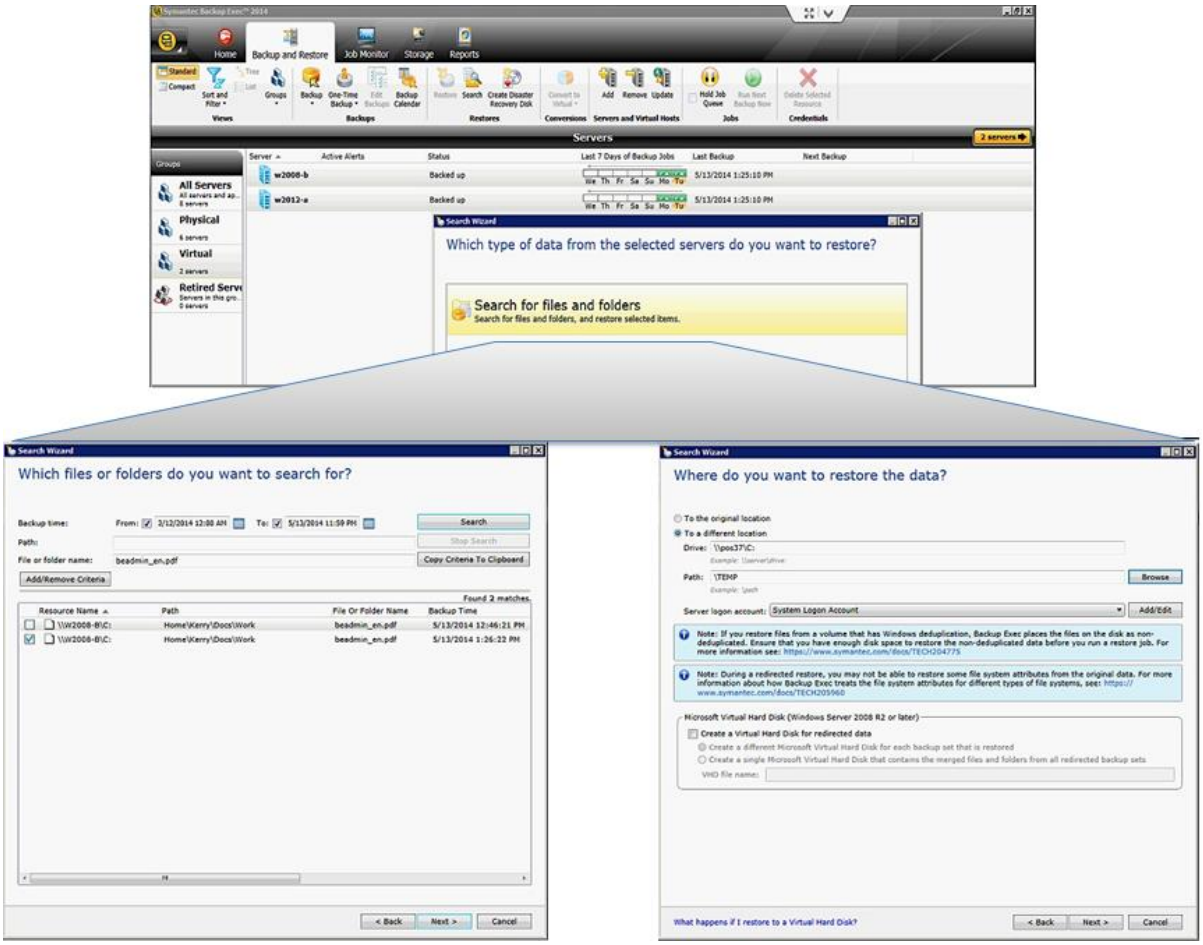
Backup Exec 2014 includes Symantec's Granular Restore Technology (GRT) that leverages catalog entries, enabling IT to simply search for individual files or application objects to be restored without having to stage them to proxy or disk first. This capability lets IT restore only the object desired instead of an entire volume. It also vastly reduces the time and effort required to mount multiple backup images and manually hunt for the specific file.

Search and Granular File Recovery

ESG Lab began this testing by adding folders containing Backup Exec 2014 administration guide PDF files for two VMs on the ESX host named ***pos72-vca***. The PDFs were added to a Windows 2008 VM (***w2008-b***) in a folder named ***Kerry,*** and to a Windows 2012 VM (***w2012-a***) in a folder named ***Vinny***. Next, the Lab backed up both VMs, and then deleted the ***beadmin.pdf*** file.

To restore, ESG Lab clicked on ***Search*** from the Backup and Restore/Restores tab and selected the ***w2008-b*** and ***w2012-a*** VMs. Restore menus are built based on the server selected. Because these VMs only contained files, when the search wizard prompted for what type of data to restore, the only option was ***Search for file and folders*** (see Figure 7, top). If there had been other data types such as Exchange or SharePoint, those options would have also been displayed. Next, the Lab selected the appropriate backup period, entered the file name ***beadmin.pdf***, and clicked search. As shown in the bottom left of Figure 7, the file was located on the server, and the Lab selected it and click Next.

Figure 7. Search and Granular File Recovery



Next, the wizard prompted for a restore location. As shown in the bottom right of Figure 7, ESG Lab selected the option to restore to a different location, in this case, a different server (***pos37***). This method of moving data might be used for disaster recovery. Two alerts were displayed to ensure a successful recovery, along with links to additional information: 1) to confirm sufficient disk space for restoring volumes with Windows deduplication, which would be restored in full and non-deduplicated; and 2) to inform the administrator that some file system attributes might not be available with redirected restores. Once all screens had been completed, the file was restored.

Granular SQL Server Restore

Many granular database recovery options require that the log files be included in the backup schema, a job often done in a separately executed backup job, after which the log files can be cleared. Backup Exec 2014 offers an optional agent for applications and database that enables integrated log-file backup and granular recovery options. It should be noted that when using GRT and VADP, the agent does not execute the backup, it only captures metadata for integrated granular recovery.

ESG Lab tested this feature and demonstrated the ability to restore from one screen. The Lab created a SQL database called ***ESGTestDatabase1*** on the ***w2008-a*** VM on ESX host ***pos72-vca***, and ran a GRT-enabled backup of the host to include this database. Once the backup was complete, the Lab deleted that database on the production VM.

Next, from the Backup and Restore tab showing all servers, the Lab selected the ESX host ***pos72-vca*** (see Figure 8, top). After highlighting the ***w2008-a*** VM in the lower panel, the Lab right-clicked and selected the option ***Restore GRT-enabled data for the selected virtual machine*** (circled in red). This launched the Restore Wizard. Through a series of screens, ESG Lab created a restore job by selecting the database for restore to its original location, requesting a physical consistency check, and selecting the option to leave the database in a ready-to-use state. No pre or post commands were enabled. The job was named, a restore summary page was displayed, and the restore was initiated. The small test database was restored quickly.

Figure 8. SQL Granular Restore

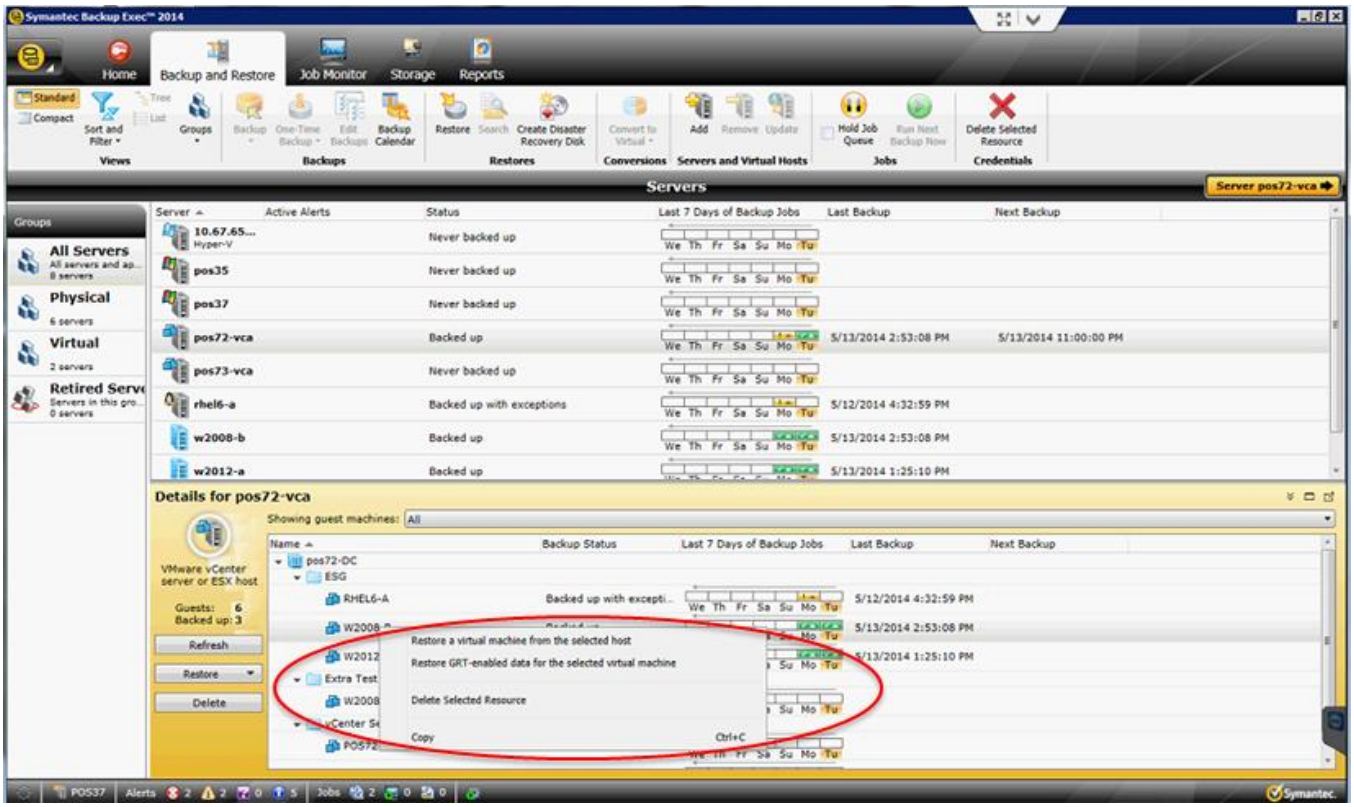
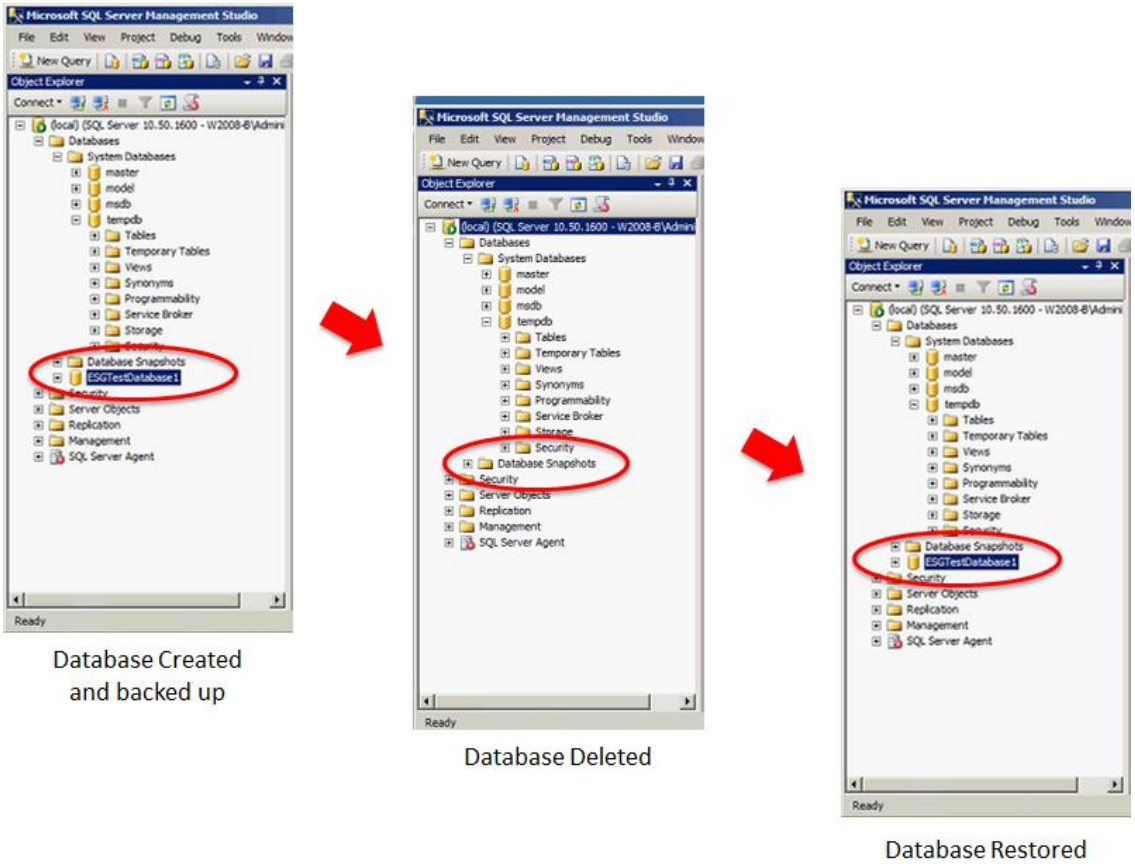


Figure 9 shows the SQL Management Studio view. On the left, it shows the database that was created and backed up. In the middle, the database has been deleted, and on the right, it has been restored.

Figure 9. SQL Management Studio View



Why This Matters

The whole purpose of backup is to restore data. As a result, data protection management applications should make the backup process as simple and efficient as possible to minimize time and costs, and they should maximize restore capabilities to ensure data integrity and the fast return to productivity. While the option to restore only the file or object you need instead of an entire volume is enticing for users and for IT, most solutions can only provide this flexibility by requiring overhead-intensive agents that slow production.

Backup Exec 2014 delivers flexible restore options without the pain. Symantec's GRT technology builds the association back to the client for granular restore. As a result, organizations can enjoy the efficiency of VADP-enabled, snapshot-based VM backups, and gain granular, browse-able, searchable restore functionality. ESG Lab validated the simplicity of searching for and recovering a specific file without having to mount multiple backup images and manually locate what you want. ESG Lab also confirmed the ease of restoring a single SQL database from a SQL Server VM in seconds, instead of restoring the entire SQL host over many hours. Also, the ability to execute all restore tasks from a single screen dramatically simplifies the restore process.

The Bigger Truth

Backup Exec 2014 is a full-featured data protection solution for virtual environments. We put that in bold text because there are still those who think of Backup Exec as a physical server solution, and that's just not the case. If you are looking for a way to ensure that your virtual workloads are safe (even those VMs that get created on the fly that IT doesn't know about), you want to validate the protection status of your VMs at a glance (even from vCenter), and you want the option to recover individual application objects and restore to different environments, then Backup Exec 2014 has all the goods.

In addition, it is an all-in-one solution to protect every part of the data center, remote office, or small office. By protecting both virtual and physical servers, Backup Exec 2014 eliminates the need for separate backup applications, workflows, and targets, reducing both costs and complexity. The GUI improvements are simple and intuitive, and enable administrators to use the job-centric and server-centric views as desired. Symantec answered the complaints of some long-time customers when it brought the job monitor back with Backup Exec 2014, and Symantec should be commended for incorporating client feedback into its solution. Also key are the flexible recovery options—including P2V, V2P, and B2V—that are important for the workload mobility and infrastructure flexibility that are essential in today's agile, virtual environment.

ESG Lab has tested Symantec Backup Exec on a number of occasions. This testing focused on the management interface, and we validated the ability to view your high-level VMware and Hyper-V protection status at a glance, drill down for detail, and manage backup and recovery tasks from a single screen. ESG Lab also confirmed that Backup Exec 2014 can deliver granular recovery with the option to delay the catalog backup to prioritize speed. The Lab was also able to easily search for a file and restore only that file, as well as recover a single SQL Server database, which are both features designed to speed restore and keep both users and IT focused on production activities.

There are a few minor nits still to be included—an *ad hoc* catalog backup, for example, would let IT back up the catalog at the time a granular recovery was needed. In addition, instant restart is still a road-map item for Backup Exec. But these are non-essentials that don't take away from the solution's overall value as a complete solution for virtual data protection.

The bottom line is that you don't have to be a large organization to get a powerful, flexible, easy-to-manage data protection solution for your virtual infrastructure. Backup Exec 2014 is the real deal.