Overview
There is little question that server virtualization is the single biggest game-changing trend in IT today. Budget-strapped IT departments are racing to embrace the promise of virtualization for many reasons:

• **Extends current IT server investment**—maximizes each server’s compute capacity.
• **Optimizes server utilization**—one server can run multiple operating systems (OS) and applications.
• **Centralizes server management**—reduces administration and operational effort and cost.
• **Smaller server footprint**—very green IT that reduces energy and IT real estate costs.

Because of the obvious total cost of ownership benefits of virtualization, and the maturing of the technology, virtual machines (VMs) are assuming more business-critical roles in the data center. In a Symantec data center survey, more than 75% of all small, medium, and large enterprise companies listed server virtualization as one of the top technologies they are adopting.¹

The data protection challenges of server virtualization
Data protection consistently tops the list of challenges that IT departments face. Data protection-related challenges include:

• **Scalability of traditional backups**—As the number of virtual machines (VMs) grow, backups within each VM competes for valuable network, CPU, and memory resources on the host server. Imagine a mission-critical application “isolated” in one VM being slowed by backups in other “independent” VMs. Resource-intensive backup and restore operations that run in VMs can lead to bottlenecks that increase backup windows and impact performance of virtualized applications.
• **Greater vulnerability**—The virtualization host server, on which all VMs reside, represents a single point of failure for multiple business-critical applications which increases the importance of systematic and automatic discovery and protection of VMs.
• **Uncontrolled Costs**—VM sprawl increases storage resources. The resulting uncontrolled growth in storage has a sharply negative impact on increasingly tight IT budgets. In addition, procuring a separate virtual-only data protection solution drives up costs associated with staffing, licensing, and storage.

Realize the promise of server virtualization
Companies are counting on virtualization to drive down cost and increase IT agility. Yet with virtualization comes a broader set of infrastructure and protection requirements. Many companies are still backing up their virtual environment the same way they protect their physical environment which can lead to performance bottlenecks and lack of visibility into what types of files are being virtualized. This can result in:

• No off-host backups
• No storage area network (SAN) backups
• No 1-step VM disaster recovery

These challenges become even more prominent in large scale VMware deployments. In some circumstances, the challenges associated with virtualization can even outweigh the benefits.

Backup strategies to help realize the true promise of virtualization:

• Unify backup and recovery across physical and virtual environments so backup operations can be streamlined under one view for simplified management, search, reporting and recovery.
• Integrate with VMware® vStorage API for more advanced data protection methods such as VM snapshots, off-host backup, and SAN transfer which reduce backup impact.
• Implement a tiered recovery strategy that ensures business-critical files are recovered quickly and efficiently, as well as the full image for disaster recovery - without having to perform additional steps or allocate additional storage space.
• Reduce the amount of backup storage with data deduplication. Much of the data that resides across an organization, whether it’s physical or virtual, is redundant. By unifying into one protection layer, redundant data can be eliminated, duplicate processes discontinued, and wasted storage prevented.
• VMware environments are dynamic and VMs can be easily cloned, so ensure that all VMs are protected, wherever they may reside.

Your data protection platform matters

Depending on which data protection technology you use, you may be forced to choose between two approaches for VM backup and recovery:

1. Perform a traditional backup in the VM
2. Perform a backup of the VM image

Neither approach is ideal, and each has specific performance and storage implications. And if you are using a virtual-only solution to protect your virtual environment, you are only seeing half the picture. Using one approach for protecting physical machines and another approach for VMs is not only inefficient, but costly. Since virtual-only solutions typically store to local disk, you still need a full-fledged backup solution to protect that local disk. This siloed approach to data protection not only leads to added complexity and slower recovery, but unnecessary backup storage growth as much of the data across physical and virtual environments data is redundant.

Symantec NetBackup™ for VMware provides V-Ray visibility into VM protection

You cannot effectively manage, recover, dedupe or protect what you can’t see. Virtual-only solutions that just automate VM protection only represent a portion of your environment. Why not reduce complexity, storage growth, and risk when virtualizing mission critical applications?

NetBackup with V-Ray breaks down virtual vs. physical silos and delivers simple, yet comprehensive backup and recovery. This award-winning unification allows for more standardization and consistent policies, reduced duplication of effort, eliminates redundant storage pools, and lowers licensing, training and operational costs.
**Figure 1:** NetBackup with V-Ray breaks down virtual vs. physical silos and delivers simple, yet comprehensive backup and recovery.

This unified view also enables full visibility into what resides within the VM as well. This allows you to see what data is redundant with your physical infrastructure. By leveraging NetBackup built-in data deduplication, only unique data is backed up across physical and virtual machines. That means significantly less backup storage is required and minimal network performance impact.

### Deduplicate everywhere—including VMs

As companies expand virtualization, storage consumption rates will climb sharply in large part due to redundant data residing on VMs. Data deduplication technology has emerged as a means to tackle this data explosion. In essence, deduplication is about shrinking the storage “footprint” by only protecting data that is unique.

The NetBackup approach encourages flexibility by offering the ability to deduplicate everywhere—at the “source” before the data leaves a server, at the media server, or on the target deduplication appliance. With NetBackup, deduplication is built in and can be managed centrally regardless of where you choose to deduplicate. This represents a significant cost and time savings in network bandwidth because data can be deduplicated at multiple data centers, remote offices, and at global locations. For customers who prefer an appliance form factor, NetBackup offers a family of appliances to meet a variety of workloads and use cases.

**Figure 2:** The NetBackup approach encourages flexibility by offering the ability to deduplicate everywhere—at the “source” before the data leaves a server, at the media server, or on the target deduplication appliance.

NetBackup with V-Ray offers extremely efficient deduplication of VM data based on its ability to see what is inside the VM image. This is unlike other deduplication solutions that treat the VM image as one large image or data block. Because
NetBackup offers integrated physical and virtual deduplication, this drives extraordinarily efficient deduplication with up to 98% deduplication rates, up to 10 times faster backup times and up to 95% reduction in storage for virtual backups.\(^2\)

**NetBackup provides deep integration with VMware for advanced protection**

Backups can affect performance and availability of the virtual environment, particularly if a traditional backup application agent is installed on each and every VM. With multiple VMs on the same physical host, network bandwidth is much more limited than in physical environments. Thus, moving backup data across the network can quickly exceed available bandwidth. In addition, backup agents on VMs consume memory and processing resources and require administrative overhead to maintain.

NetBackup accomplishes off-host backup through deep integration with the VMware® vStorage API for Data Protection (VADP). Additionally, NetBackup includes several forms of storage-optimization for VMware backups:

- Block-level incremental backup – only changed Virtual Machine Disk (VMDK) blocks are backed up, saving both time and storage.
- When backing up a VMDK file, only the in-use blocks are backed up, skipping any vacant blocks.
- When backing up Windows® VMs, deleted blocks and files are excluded from New Technology File System (NTFS) overhead.

**Single file restore and application recovery without the mount and search shuffle**

Recovering files and applications with most solutions is a shot in the dark. IT repeatedly has to guess what VM backup has the needed file. V-Ray offers patented visibility to see deep inside VMware backup images to automatically discover and recover a single file. In addition, NetBackup can recover SQL, Exchange and SharePoint® databases, and database objects for Microsoft® Exchange and SharePoint®. This means with one backup pass, NetBackup is able to recover a single file, database objects, as well as the full image for disaster recovery. All data is cataloged so you can recover in minutes instead of a manual VM restore, mount and search shuffle that can take hours or even days.

That also means that NetBackup is more storage-efficient than traditional backups as data is written to backup storage just once. For companies already performing mutliple backup operations to achieve the same amount of granularity, you can expect a 50% or more reduction in backup storage.

V-Ray extends this capability even further by providing direct and immediate single file, database or application image recovery, regardless of what backup storage was used (disk, tape, dedupe, etc.). This flexibility dramatically reduces the backup storage required as well as the time associated with doing the recovery operation.

**Faster disaster recovery (DR) for global backup environments**

Server virtualization can offer a measure of business continuity: if one VM should fail, you can quickly restart it on the same or different host. But this approach fails to address the greater risk of “all the eggs in one basket” should the physical host go down. Using NetBackup, you can increase the reliability of your recovery process by replicating VM backup images to a DR site and keeping all of your VM backup data in one catalog. This allows you to see copies of data in the data center and in the DR site from one location. This consolidation and visibility increases the speed of recovery at a DR site because you eliminate the need to import backup data into the backup catalog. And because NetBackup can let you assign different retention periods to

copies of data, you can easily migrate that VM image off to tape after a certain period of time with no change in your recovery process.

Combining both NetBackup replication and deduplication capabilities can dramatically reduce the size of backups by only moving unique segments of data. This strategy also provides a bandwidth-efficient means to transfer large amounts of data to DR sites and eliminates the need of having to truck tapes offsite. NetBackup manages all copies of backup data based on defined policies, which expedites restores from these DR copies and simplifies expiration of old data from both the data center and the DR site.

Automate VM discovery and protection
VMs by design are easy to deploy and clone, which explains why VM sprawl is a growing concern. And, as the number of virtualized servers grows, management of backup and recovery becomes more problematic. As this environment grows using a manual ticketing process to communicate that a VM has been created and needs to be backed up can introduce additional risk.

NetBackup excels in large VMware environments using NetBackup’s VM Intelligent Policy. This means avoiding time-consuming backup administration, unprotected VMs and overloading VM hosts. NetBackup leverages V-Ray to automatically discover, identify and protect VMs as they come online - whether they are new, cloned or migrated from another location. This means that VMs can be protected wherever they may reside, and without having to edit the backup policy.

In addition, NetBackup’s VM Intelligent Policy ensures backup performance is optimized by spreading the backup load equally across VM hosts. And backup administration is further minimized as NetBackup automatically adjusts for changes made to every VM by VMware technologies such as vMotion™, Storage vMotion™, and Distributed Resource Scheduling (DRS).

Summary
Organizations face a number of new challenges as their server virtualization projects embrace mission critical applications with high requirements for data protection. Symantec NetBackup with V-Ray breaks down virtual vs. physical silos and delivers simple, yet comprehensive backup and recovery. With award-winning integration with VMware® vStorage API, single file restore, and flexible VM-optimized deduplication, NetBackup puts an end to the dark ages of virtualization and helps you to realize the true promise of server virtualization.
More Information

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http://enterprise.symantec.com

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Call toll-free 1 (800) 745 6054

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