

# IBM Tivoli Storage Manager for Virtual Environments



*Non-disruptive backup and instant recovery:  
Simplified and streamlined*

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## Highlights

- Simplify management of the backup and restore process for virtual machines
  - Utilize VMware's vStorage APIs for Data Protection, including block-level incremental backups based on VMware's Changed Block Tracking
  - Offload the backup workload from virtual machines and production VMware ESX hosts to vStorage backup servers
  - Provides flexible recovery options—file, volume or image—from a single-pass backup
  - Simplify day-to-day administration with the centralized IBM Tivoli® Storage Manager console
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The ease with which an organization can create virtual machines in its computing environment has been a major contributor to the rapid and widespread growth of virtualization. The sprawling numbers of virtual machines that have resulted, however, have created challenges for managing data protection. Backing up and restoring data for a dozen or more virtual machines that may reside on an enterprise server can bring all other operations on that server to a grinding halt.

IBM Tivoli Storage Manager for Virtual Environments provides an effective solution to this challenge. With it, the burden of running backups on a virtual machine is eliminated by offloading backup workloads from a VMware ESX or ESXi-based server to a centralized vStorage backup server. The vStorage backup server, which itself may be run from within a virtual machine, takes full and incremental snapshots of virtual machines, processes backups without the disruption and overhead of running backup tasks from within each virtual machine, and sends the results to an IBM Tivoli Storage Manager (v5.5 or higher) server for management and distribution to the organization's storage pool.

Incremental backups occur at a block level, leveraging VMware's Changed Block Tracking capability in the vStorage APIs for Data Protection, and periodic full backups take a non-disruptive snapshot at the virtual machine image level. In addition to VM image-level restore, near-instant recovery can be applied at the file level or the disk volume level, providing end users flexibility from a single-pass backup. The solution simplifies day-to-day administration with the centralized Tivoli Storage Manager console.

The file- and volume-level restore capabilities are supported for Microsoft® Windows® and Linux® guest machines, and all guest operating systems are supported for VM image-level restore.

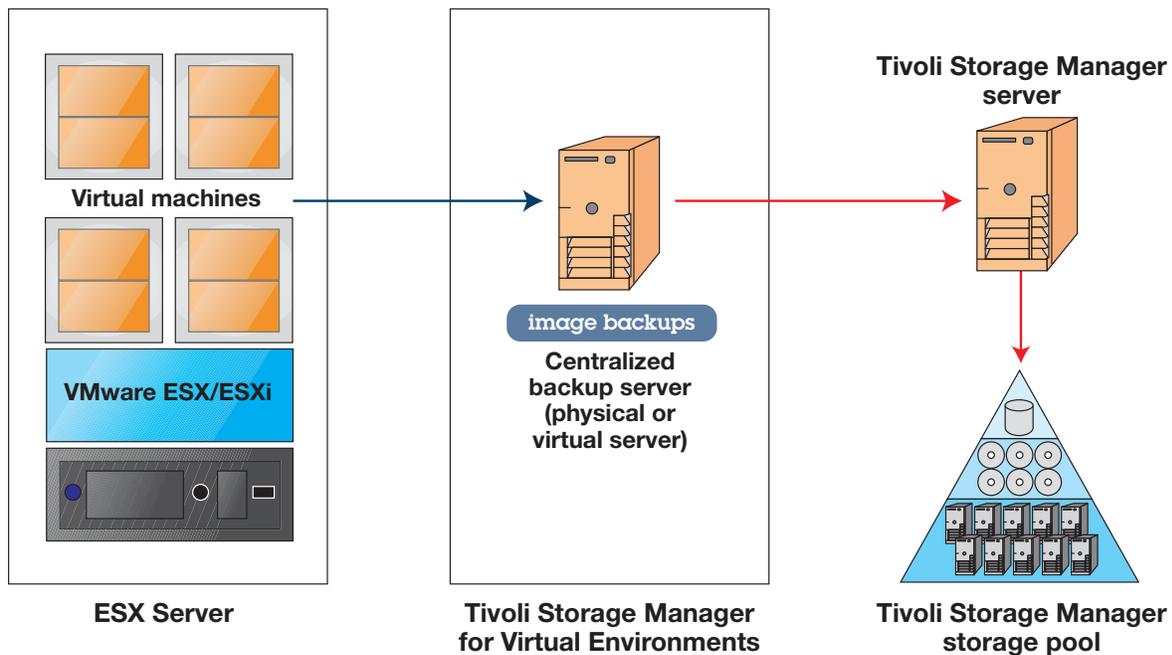


## Enabling faster, more frequent protection for virtual machines

Virtualization has proven to be a key technology in creating the instrumented, interconnected and intelligent operations that characterize today's smarter planet. The ability of Tivoli Storage Manager for Virtual Environments to control and protect the massive amounts of information that virtualized environments generate can move virtualization to still greater success with higher levels of manageability and reliability.

As organizations migrate from single-purpose physical servers to consolidated virtualization, Tivoli Storage Manager for Virtual Environments delivers a powerful solution for any use of virtual machines—whether as core internal infrastructure to support basic functions such as file and print, as platforms for finance or other internally facing business uses, or as platforms for online commerce or other externally facing applications.

### Virtual server backup architecture



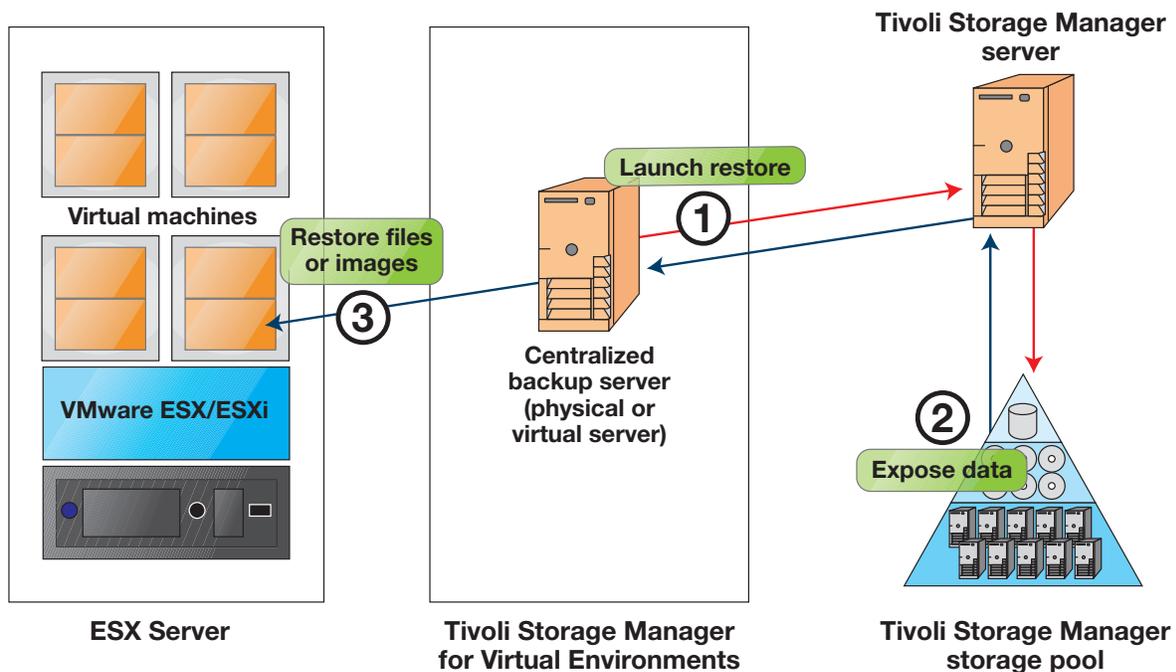
The Tivoli Storage Manager for Virtual Environments agent on a centralized vStorage backup server takes snapshots directly from the VMware server and transfers data to a server running Tivoli Storage Manager for placement and management in the storage pool.

Tivoli Storage Manager for Virtual Environments integrates with and extends the role of Tivoli Storage Manager in meeting needs for backup and recovery, online database and application protection, disaster recovery, data reduction, bare-machine recovery, space management, and archiving and retrieval. In the virtualized environment, it provides both improved frequency of backups to reduce the amount of data at risk, and faster recovery of data to reduce downtime following a failure.

### Eliminating overhead with centralized vStorage backup

Tivoli Storage Manager for Virtual Environments supports the VMware vStorage APIs for Data Protection technology that simplifies and streamlines operations by utilizing agents placed on physical or virtual vStorage backup servers. Unlike agents placed on the virtual machines themselves, the vStorage APIs greatly reduce the system overhead and any disruption that backups may cause to virtual machine operations.

#### Virtual server restore process



To restore files or volumes, the administrator launches a command on the vStorage backup server, exposes a snapshot that was saved in the storage pool, and maps the mounted data back to the virtual machine.

In the vStorage model, the agent has the ability to read and write directly from and to the VMware server's storage, handling backup schedules and then transferring data to a server running Tivoli Storage Manager for reporting and management. In this backup process, no intermediate storage is required—data passes through the vStorage backup server for processing but does not remain on the system. The vStorage backup server can reside in a virtual machine in the same VMware server with no additional hardware required.

By conducting operations on the backup and management servers rather than the virtual machine, the process achieves a number of advantages:

- Centralized and simplified management—one Tivoli Storage Manager agent supports multiple virtual machines
- Reduced workload on the virtual machine—allowing other operations to continue during backup
- Faster backups and less redundant data—eliminating the need for traditional backup windows by continuously capturing data changes at the block level
- Support for LAN-free data transfer from the VMware server's storage to the backup server—preserving bandwidth for other uses

Additional support for backup processes and VMware solutions include automatic discovery of virtual machines, automatic configuration of backup of new virtual machines, support for deduplication, incremental backup using VMware's vStorage Changed Block Tracking, and automatic detection of a virtual machine's new location when it is moved using VMware vMotion.

### Retrieving data from image-level backups

Tivoli Storage Manager for Virtual Environments gives users the flexibility to perform a file-level, volume-level or VM image-level recovery using a single backup of a virtual machine image. Periodic capture of data changes at the block level reduces the amount of data at risk between full backups and enables applications and users to get back up and running within minutes following any data loss.

In a file restore operation, the administrator launches the Tivoli Storage Manager for Virtual Environments restore on the vStorage backup server, accesses a point-in-time view of the data in the storage pool using Tivoli Storage Manager, and performs a drag-and-drop of the desired files. The file restore operation can also be initiated from within the virtual guest environment.

For a full disk volume restore, Tivoli Storage Manager for Virtual Environments mounts the point-in-time snapshot for that volume, mounted to the recovery volume, and makes it available immediately to users and applications, while the actual data recovery happens in the background. All requests to write to and read from the volume are handled first, providing full, near-normal performance during the recovery process.

VM image-level restores provide the comprehensive recovery of not only the data but the complete computing environment—from operating systems, applications and patches to upgrades and custom configurations.

### **Conclusion**

Tivoli Storage Manager for Virtual Environments extends the industry-leading capabilities of the Tivoli Storage Manager family in the rapidly growing area of virtual servers. It addresses the growing need for simplified, streamlined and reliable backup and restore processes that allow virtual machines to continue operations and allows their users to remain productive without disruption. It provides the scalability necessary to handle huge data protection needs in rapidly growing virtual environments. It provides a solution that is safe and effective in the virtual environment—because it was designed specifically for use with virtual machines rather than physical systems.

### **For more information**

To learn more about IBM Tivoli Storage Manager for Virtual Environments, contact your IBM sales representative or IBM Business Partner, or visit: [ibm.com/tivoli/products/storage-mgr-ve](http://ibm.com/tivoli/products/storage-mgr-ve)

### **About Tivoli software from IBM**

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