

VMware vStorage VMFS

High-Performance Cluster File System for Storage Virtualization

AT A GLANCE

VMware® vStorage Virtual Machine File System (VMFS) is a high-performance cluster file system that provides storage virtualization optimized for virtual machines. Each virtual machine is encapsulated in a small set of files and VMFS is the default storage system for these files on physical SCSI disks and partitions.

BENEFITS

- Greatly simplify virtual machine provisioning and administration by efficiently storing the entire virtual machine state in a central location.
- Run multiple instances of VMware ESX™ to access the same virtual machine storage concurrently.
- Support virtualization-based distributed infrastructure services using VMware vCenter™ Server, VMware VMotion™, VMware DRS and VMware HA.



How Is VMware vStorage VMFS Used in the Enterprise?

The VMware vStorage VMFS is a prerequisite for building the dynamic, automated and self-optimizing datacenter. VMFS enables virtualization-based distributed services including:

• Distributed resource optimization.

VMFS allows multiple instances of VMware ESX to access the same virtual machine storage, and as a result, virtual machines can be dynamically and automatically migrated between instances of VMware ESX, enabling:

- Dynamic allocation of resources in resource pools
- Live migration of running virtual machines among different servers

• High Availability.

VMFS handles on-disk locks and SCSI reservations enabling:

- Virtual machine clustering with Microsoft® Clustering Services
- Automatic restart of virtual machines on different physical servers

• Efficient off-host backup.

VMFS allows a proxy server to backup a snapshot of a virtual machine while the virtual machine is simultaneously reading and writing to its storage.

How Does VMware vStorage VMFS Work?

VMFS is optimized, rigorously tested and certified for a wide range of Fibre Channel and iSCSI SAN equipment. VMFS efficiently stores the entire virtual machine state in a central location and can be created in advance, enabling instant provisioning of virtual machines, without relying on a storage administrator.

Conventional file systems allow only one server to have read write access to the same file at a given time. In contrast, VMFS is a cluster file system that leverages shared storage to allow multiple instances of VMware ESX to read and write to the same storage, concurrently. VMFS provides on-disk locking to ensure that a virtual machine is not powered on by multiple installations of VMware ESX at the same time. Should a server fail, the on-disk lock for each virtual machine is released to allow the virtual machine to be restarted on other physical servers.

• Cluster file system.

Create the foundation for virtualization-based distributed infrastructure services by storing virtual machine files on shared storage as Fibre Channel and iSCSI SAN.

- **Shared data file system.**

Enable multiple installations of VMware ESX to read and write from the same storage location concurrently.

- **Online insertion or deletion of nodes.**

Add or delete a VMware ESX host from a VMFS volume without pausing or halting the processing of other ESX hosts on that volume.

- **On-disk disk file locking.**

Prevent virtual machines from being powered on by multiple servers at the same time.

- **Performance and Scalability**

- *Optimized for virtual machine I/O.*

Store and access the entire virtual machine state efficiently from a centralized location with virtual disk performance close to native SCSI.

- *New – Adaptive block sizing.*

Uses large block sizes favored by virtual disk I/O. Use sub-block allocator for small files and directories.

- *New – Dynamic increase of VMFS volume size.*

Create new virtual machines without relying on a storage administrator. Adaptive block sizing and addressing for growing files allows to increase a VMFS volume on the fly.

- *New – Increased number of ESX hosts per VMFS volume.*

Connect up to 32 ESX hosts to a single VMFS volume.

- *New – Extended block size and file limits.*

Run even the most data intensive production applications such as databases, ERP and CRM in virtual machines

Maximum virtual disk size: 2TB

Maximum file size: 2TB max

Block size: 1MB to 8MB

- **Interoperability**

- *Certification.*

Use VMFS with a wide range of Fibre Channel and iSCSI SAN equipment. VMFS is optimized, rigorously tested and certified for these storage systems.

- *Idealized SCSI compliant virtual disks.*

Use virtual disk files that appear to the virtual machine as a mounted SCSI device. Virtual disks hide all intermittent SAN errors from the operating system, allowing even operating systems not certified for SAN to run inside a virtual machine.

- **Manageability**

- *LUN discovery and management.*

Simplify storage management with automatic discovery of LUNs in the shared storage and mapping of those LUNs to a VMFS volume.

- *New – File directories.*

Enable easy virtual machine administration with file directories. All files for a virtual machine are stored in a separate directory.

- *Direct pass through of virtual machine data.*

Ensure correct application behavior and data integrity for applications running in virtual machines. VMFS preserves the internal file system semantics of the operating system running inside the virtual machine.

- *New – Unified hierarchical namespace.*

Manage all available physical disks, logical volumes and VMFS volumes with a consistent namespace that eliminates potential conflicts.

- **High Availability**

- *New – Virtual machine snapshots.*

Increase application availability while reducing backup windows using virtual machine snapshots. Create a point-in-time copy of virtual machine data that can be used for testing, backup, and recovery operations.

- *New – Hot add virtual disk.*

Add virtual disk to a running virtual machine to increase available resources or for backup.

- *New – Distributed journaling.*

Recover virtual machines faster and more reliably in the event of server failure.

Find Out More

How Can I Purchase VMFS?

The VMware vStorage Virtual Machine File System is a component of VMware vSphere™ 4 and is not available as a standalone product. For more information on VMware vSphere™, visit the VMware Web site at <http://www.vmware.com/go/vsphere>.

For information or to purchase VMware products, call 1-877-4VMWARE (outside of North America dial +1-650-427-5000), visit www.vmware.com/products, or search online for an authorized reseller. For detailed product specifications and systems requirements, please refer to the ThinApp install and configure guide.

