Hewlett Packard Enterprise

Best-in-class storage for VMware Virtual Volumes

HPE 3PAR StoreServ integration with VMware Virtual Volumes

Enable differentiated application management and performance with VM-level granularity and rich data services.

Greater application control
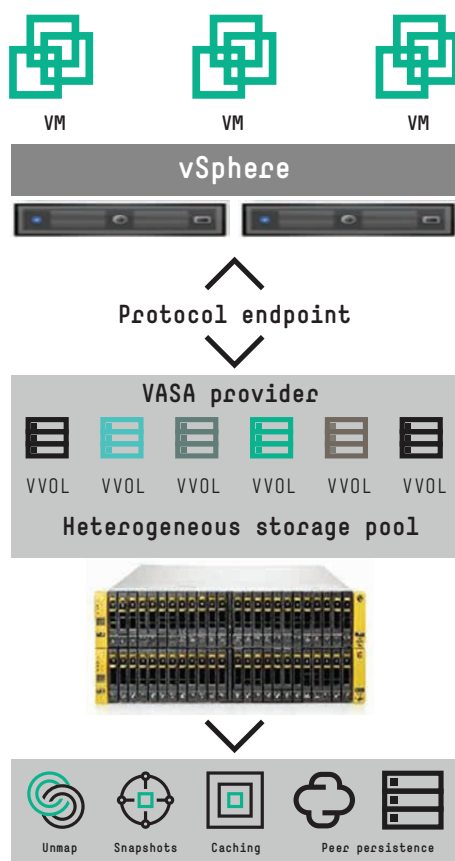Deploy features like space reclamation and performance acceleration on a per-VM basis.

Lower capacity costs
Reduce capacity costs by automatically reclaiming space from deleted or migrated VMs.

Snaps on different tiers
Assure recovery times and meets recovery-point objectives (RPOs) with thousands of per-VM recovery points.

The following figure illustrates VMware VVOLs integration with shared storage:

VM   VM   VM

vSphere

Protocol endpoint

VASA provider

VVOL   VVOL   VVOL   VVOL   VVOL   VVOL

Heterogeneous storage pool

Unmap   Snapshots   Caching   Peer persistence

Introduction to VMware Virtual Volumes

While server virtualization has been extremely successful at addressing numerous IT challenges, in order to maximize efficiency, tighter integration between storage and applications is required. Closing this gap unlocks new possibilities to improve application alignment with critical storage resources. For this reason, VMware® and HPE, have worked together for several years on a new storage architecture that provides better integration between shared storage and VMware vSphere.

The result of this effort—VMware Virtual Volumes (VVOLs)—represents significant innovation by changing the way that vSphere Virtual Machines (VMs) interact with shared storage. More specifically, VVOLs provides VM-level granularity by introducing a 1:1 mapping of VMs to storage volumes and supports policy-based management to simplify storage management in virtualized server environments. Prior to the introduction of VVOLs, storage arrays primarily integrated with vSphere at the datastore level using VMware's Virtual Machine File System (VMFS). Moving forward, users can choose to use VMFS or VVOLs (or both), with VVOLs offering more advanced capabilities.

In a typical data center, storage arrays have different performance and availability capabilities that should be aligned with the requirements of individual applications. Until now, it has been up to the storage administrator to ensure this alignment. Without VVOLs functionality, storage capabilities could not be applied directly to individual VMs and had to be applied to a datastore/LUN, which often contains numerous VMs. The addition of VVOLs functionality into VMware vSphere leverages the newly enhanced vSphere APIs for Storage Awareness (VASA), allowing vSphere admins to assign storage profiles on a per-VM basis and choose storage system capabilities for each and every application.

HPE 3PAR StoreServ: The Fibre Channel reference platform

HPE is one of a select number of original design partners working closely with VMware to define, develop, and test the VVOLs architecture, with HPE 3PAR StoreServ Storage serving as the Fibre Channel (FC) reference platform for this project. HPE's early in-depth collaboration with VMware on the VVOLs architecture ensures that HPE 3PAR StoreServ Storage customers benefit from the best VVOLs experience possible and one that is aligned with the modern storage architecture delivered by HPE 3PAR StoreServ Storage arrays.

VMware VVOLs technical details

The VVOLs architecture is part of the VMware VASA 2.0 specification, which defines a new architecture for VM-level storage array abstraction. VASA 2.0 includes new interfaces to query storage policies to enable VMware's Storage Policy Based Management (SPBM) to make intelligent decisions about virtual disk placement and compliance.

The VASA 2.0 specification describes the use of virtual volumes to provide ease of access and ease of manageability to each VM datastore. Each VMware Virtual Machine Disk (VMDK) is provisioned as a separate VVOL within the storage system. A single point of access on the fabric is provisioned via a protocol endpoint from the host to the storage. These protocol endpoints are rediscoverable using regular Logical Unit Number (LUN) discovery commands.

Benefits of HPE 3PAR StoreServ for VMware VVOLs

HPE 3PAR StoreServ Storage delivers a unique set of storage data services that are ideal for server virtualization environments, a key reason why both **DCIG** recently ranked HPE 3PAR StoreServ as the #1 storage platform for vSphere integration and server virtualization, respectively. Continuing this leadership, HPE is now delivering the following benefits through the integration of VMware VVOLs and HPE 3PAR StoreServ:

• Greater application control and efficiency with differentiated data services

• Rapid enablement with zero configuration VMware VVOLs deployment and startup

• Enhanced performance by offloading data services

• Simplified, policy-based management

• Support for VASA 2.0 enables enhanced management capabilities via VASA protocol

• Support for automatic space reclamation

Greater application control and efficiency with differentiated data services

The new VM-level granularity that VMware VVOLs provides finally enables customers to apply the rich array-based data services built into HPE 3PAR StoreServ Storage to specific applications and VMs in the following manner:

• Ensure application specific performance and control by using HPE 3PAR Priority Optimization to apply QoS policies to individual VMs instead of entire datastores.

• Maintain efficiency by automatically reclaiming space from deleted or migrated VMs using capabilities built into the HPE 3PAR ASIC.

• Optimize storage efficiency with HPE 3PAR Thin Deduplication which can now be turned on and off on a per-VM basis.

• Accelerate performance by automatically detecting and moving your most frequently-accessed VMs onto flash-extended cache using HPE 3PAR Adaptive Flash Cache.

• Eliminate data sprawl by performing the migration functions at the VM or application level with HPE 3PAR Federation technologies.

Rapid enablement with automatic deployment

With the autonomic configuration for VMware VVOLs built within the HPE 3PAR StoreServ Operating System, there is no need for separate plug-ins or VMs to be installed, configured, maintained or duplicated for redundancy in order to use VMware VVOLs.

Enhanced performance

VMware VVOLs enables vSphere to offload more tasks to storage that can be performed faster and more efficiently at the storage

layer. Tight storage integration enables HPE 3PAR StoreServ Storage to present unique capabilities and complete common tasks, such as creating snapshots, directly on the array to help minimize data movement and improve application performance. With VMware VVOLs, HPE 3PAR StoreServ Storage enables deployment and restoration of array-based snapshots on a per-VM basis to a disk tier different from the production data, which helps save valuable capacity.

Simplified, policy-based management

Autonomic integration into VMware's SPBM simplifies common storage management tasks like LUN provisioning and management. By using policies to automatically provision LUNs at the time of VM creation, no pre-provisioning of datastores is required and administrative costs are reduced by eliminating tedious tasks. HPE 3PAR StoreServ Storage offers the flexibility of being a single storage container for a vSphere administrator to manage and track.

Best-in-class integration

HPE 3PAR StoreServ Storage delivers best-in-class, hardware-assisted integration with VMware vSphere along with built-in capabilities to double your VM density and cut your capacity requirements in half. Integration with the VMware VVOLs architecture, developed in close collaboration with VMware over the course of several years, enables HPE 3PAR StoreServ to provide even better vSphere integration that further leverages the native strengths and capabilities of the HPE 3PAR StoreServ Storage array.

Learn more at
hpe.com/us/en/storage/3par.html

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