

VMware vSphere Virtual Volumes

Management and Integration Framework for SAN/NAS

AT A GLANCE

VMware vSphere® Virtual Volumes™ is an integration and management framework for external storage. Virtual Volumes streamlines storage operations through policy-driven automation, enabling more agile storage consumption for VMs. Virtual Volumes simplifies the delivery of storage service levels to individual applications by providing finer control of storage resources at VM granularity. Overprovisioning is eliminated as each VM will consume the exact resources needed - nothing less, nothing more.

KEY BENEFITS

- Finer, VM-granular control of storage resources
- Streamlined and automated storage operations
- Flexibility to choose from a broad ecosystem

What is vSphere Virtual Volumes?

Virtual Volumes is an integration and management framework for external storage (SAN and NAS). This framework allows customers to easily assign and manage storage capabilities on a per-application (per-VM) basis at the hypervisor level using Storage Policy-Based Management (SPBM).

Virtual Volumes is an industry-wide initiative that will allow customers to leverage the unique capabilities of their current storage investments and transition without disruption to a simpler and more efficient operational model optimized for virtual environments that works across all storage types.



Figure 2 - Virtual Volumes Partner Ecosystem

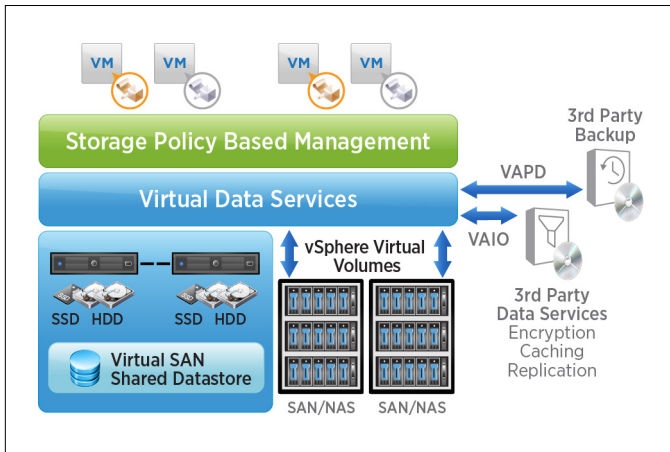


Figure 1 - Software-Defined Storage Marketecture

Key Elements of vSphere Virtual Volumes

Flexible consumption at the logical level

Virtual Volumes virtualizes SAN and NAS devices by abstracting physical hardware resources into logical pools of capacity (called Virtual Volumes datastore) that can be flexibly consumed and configured to span a portion, one or several storage arrays. The Virtual Volumes datastore defines capacity boundaries, access logic, and exposes a set of data services accessible to the VMs provisioned in the pool. Virtual Volumes datastores are purely logical constructs that can be configured on the fly, when needed, without disruption and without being formatted with a new file system.

Native VM representation

Virtual Volumes defines a new virtual disk container (Virtual Volume) that is specific to a VM and independent of the underlying physical storage representation (LUN, file system, object, etc.). The virtual disk becomes the primary unit of data management at the array level. This turns the Virtual Volumes datastore into a VM-centric pool of capacity, enabling execution of storage operations with VM granularity and provisioning of native array-based data services to individual VMs. Admins can now ensure the right storage service levels are provided to each individual VM.

Efficient operations through automation

Storage Policy-Based Management (SPBM) allows capturing storage service levels requirements (capacity, performance, availability, etc.) in the form of logical templates (policies) to which VMs are associated. SPBM automates storage provisioning by identifying available datastores that meet policy requirements and, coupled with Virtual Volumes, dynamically instantiates necessary data services. Through policy enforcement, SPBM also automates service-level monitoring and compliance throughout the lifecycle of the VM.

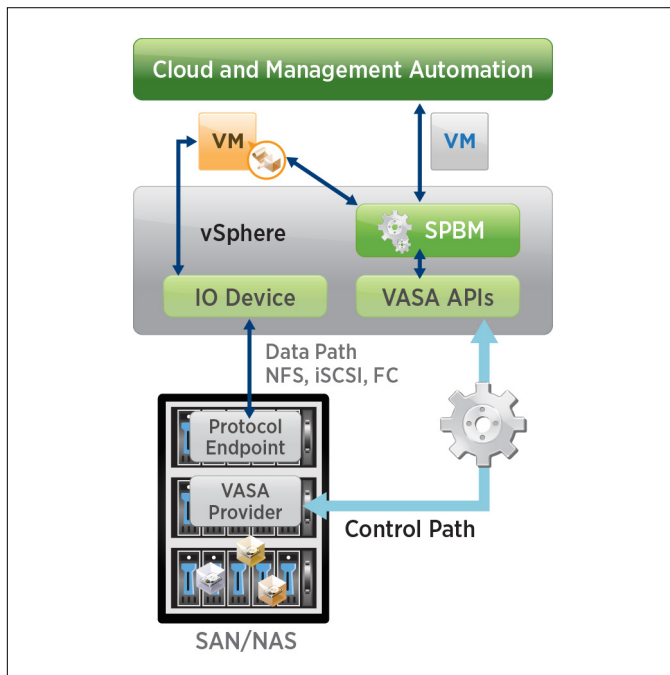


Figure 3 - Virtual Volumes Storage Architecture

Benefits of Virtual Volumes

Finer Control

With Virtual Volumes, admins can easily deliver and enable the right storage service levels to individual VMs according to the specific requirements of an application. By having finer control over storage resources and data services down to the VM level, the administrator can create exact combinations and precisely deliver storage service levels. Overprovisioning is eliminated because pre-provisioning of a fixed datastore is eliminated and each VM consumes the exact resources needed—nothing less, nothing more.

Streamlined Storage Operations

For both the VI Admin and Storage Admin, Virtual Volumes greatly simplifies management and reduces dependencies over the existing operational model.

In the VMware SDS model with Virtual Volumes, the Storage Admin sets up the Virtual Volumes datastore. The capacity and data services published by the Storage Admin for the Virtual Volumes datastore become simple menu items from which the VI Admin can select on demand when creating a VM policy. The Storage Admin retains control of the storage resources, as the VI Admin can only consume published capabilities. However, the VI Admin can now determine which data services should be assigned to a VM by selecting the appropriate policy during VM creation. Thus, the Storage Admin is responsible for up front setup, but the VI Admin is self-sufficient afterwards.

With Virtual Volumes, the VI Admin gains control and becomes responsible for defining the various storage classes of service for VMs. However, the classes of service are no longer physical pre-allocations, but instead they are logical entities controlled and automated entirely by software and interpreted through the mechanism of policies. By associating one or many VMs to the right policy, the provisioning and instantiation of storage service levels is automated for that VM or set of VMs. Automated policy enforcement also becomes the mechanism to simplify the monitoring process and to ensure compliance of storage service levels throughout the lifecycle of the application.

Policy-driven automation enables more agile storage consumption for VMs, which ultimately delivers faster provisioning for new applications with different requirements and simplifies change management, as the VI Admin no longer depends on the Storage Admin to fulfill infrastructure change requests. The VI Admin can make changes to policies at any time, and the necessary infrastructure changes are configured through automation. This allows for quicker adjustment to business changes.

Policies that combine array capabilities and software-based data services, such as third-party caching and replication services enabled through integration with vSphere APIs for IO Filtering (VAIO), can also be created in SPBM.

Flexibility of Choice

Virtual Volumes is an industry-wide initiative that will allow customers to leverage the unique capabilities of their current storage investments and transition without disruption to a simpler and more efficient operational model optimized for virtual environments. Customers can also manage heterogeneous storage and software-based data services using a common control plane provided by SPBM.

