

SOLUTION BRIEF

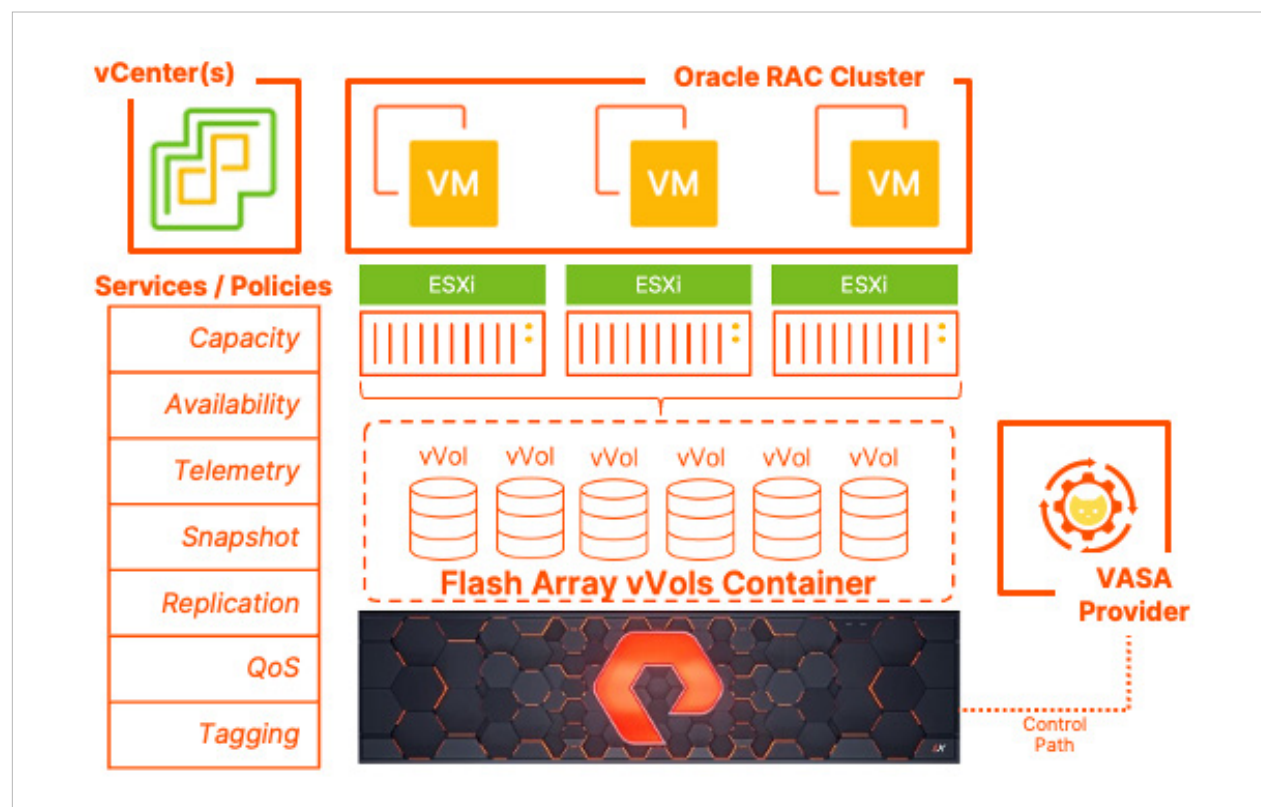
Five Reasons to Use VMware Virtual Volumes with Oracle Databases

Why Virtual Volumes (vVols) are so compelling for database workloads.

VMware is a widely used virtualization platform for running Oracle databases. In the past, database storage options available to DBAs for creating virtual disks were limited to either a VMFS (Virtual Machine File System) datastore, or a RDM (Raw Device Mapping) disk.

Simplify Storage Management across Your Organization

VMware vVols radically simplify storage management for infrastructure administrators, storage administrators, and database teams. vVol datastores address the challenges of over-abstraction of virtual disks in VMFS datastores on one end and rigidity of RDM (raw device mapping) datastores on the other. vVols unlock the ability to directly interact with powerful, resilient storage platforms like Pure Storage® FlashArray™ systems.

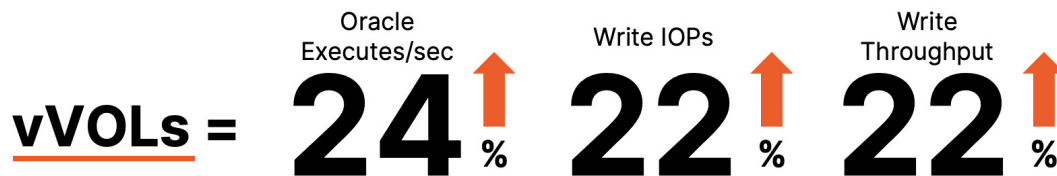


Here are five areas where vVols powered by Pure Storage provide real technical and business value in support of production Oracle databases.

1 Improved Performance

Production Oracle databases typically have stringent storage performance requirements. Delivering sustained high-performance along with high-availability are fundamental goals for all Oracle-based applications in order to meet the demanding business service-level agreements (SLAs). Business SLAs are often directly tied to the quality of service provided by enterprise databases.

In a recent analysis by VMware¹, performance was, on-average, 23% better for Oracle workloads running on vVols compared to traditional VMFS storage. Higher transactions-per-second, higher IO read/write maximums, and lower latency all drive better resultant performance at scale for enterprise database workloads.²



VMware Blog, "Oracle Workloads on VMware Virtual Volumes", August 2022

Database performance and efficiency are often tied directly to critical application efficiencies that are foundational to key business outcomes. vVols performance benefits help maximize what a virtualized Oracle database can deliver. And Pure Storage is a leading vVols compliant storage platform: Pure serves as one of VMware's most active design partners and with thousands of production vVols Customers worldwide.

2 Copy Data Management with Oracle Databases

VMware vVols directly access Pure Storage FlashArray snapshots, volume cloning, and replication functionality, offering vastly reduced complexity compared to VMFS and raw-device methods. No longer are complex scripting, clunky orchestration, or time consuming network copies required to get your data to the applications that need it. With a vVol being the single object of record for a workload or a database, you can bridge the gap between the physical, virtual, and cloud worlds.³

A foundational benefit of Pure Storage comes from the way that we provide snapshot functionality. Pure volume snapshots are all metadata-based so when a volume is copied or cloned, the array is just copying metadata. The array is not actually moving or copying the data, enabling copies to be created no matter how large they are. Large database volumes can be snapshotted instantly—there is no waiting for these tasks to complete. And these snapshots are fully data-reduced and there's no vSphere performance impact when they're created since they're just metadata pointers.



3 Oracle Database and Storage Mobility

Oracle RAC requires shared disks to be accessed by all nodes of the RAC cluster. Traditionally this is addressed by provisioning multi-write enabled VMFS disk. A big challenge exists because multi-write enabled VMFS-based virtual disks do not support hot extending capacity. So, increasing the size of shared disk in an Oracle cluster requires downtime to add capacity.

In late 2023 VMware introduced the ability to increase the size of a shared vVols based disk without deactivating the cluster.⁴ This effectively means no downtime is required for adding shared storage capacity. This is a game-changer for production database clusters running on vSphere.

Many businesses run their production workloads on physical servers and their lower tier environments on virtual servers. The Pure Storage vVol snapshot/clone/replication processes can be used to provision and refresh clones of a production Oracle database running on physical servers. As a basic example, if you are running a production Oracle database on a virtual machine backed with vVols, you can easily provide the database data to your bare metal data warehouse environment, your virtual Test/Dev environment, and a DR copy to the cloud.

4 Data Services Automation and Policy Enforcement

The benefits of vVols isn't only based on better performance and mobility—there is real value derived from the VMware Storage Policy Based Management (SPBM) capability in vSphere that applies to vVols.⁵ SPBM policies can be created in the vCenter policy interface that set requirements for placement, snapshot schedules, replication schedules, performance quality of service parameters, as well as volume tag assignments.

Policies can be applied to entire virtual machines, virtual machine templates, or to individual disks. vCenter continually checks for compliance and if a storage setting is changed or a volume is relocated and the data service policy is violated, this results in a compliance alert or trap. In this way policy assignments can help enforce standardized data services that serve as the basis for placement, performance, availability, and data protection. This automated governance capability prevents service configuration drift and can help catch errors made by manual or automated changes.

When policies are assigned during the provisioning process, the SPBM policy engine ensures that initial placement of workloads is accurate based on the data service attributes that are part of the policy. This results in correct services being assigned on Day 0. Because SPBM policy changes go into effect immediately, if a volume or VM needs to be assigned to a different policy—the changes are made non-disruptively and with immediate effect.

This type of data-service automation is built into vSphere and is foundational to providing more consistent services to business critical applications like Oracle databases.



5 Intrinsic Security for Oracle Databases

SafeMode™ Snapshots, a built-in feature of the FlashArray operating system, enables you to create read-only snapshots of backup data and associated metadata catalogs. SafeMode snapshots cannot be altered, encrypted, or deleted—whether it's unintentional, by a rogue employee, or through a hacker's programmatic approach. This is a powerful way to provide immutable backups at the individual volume (versus an entire VMFS datastore) level.⁶

When tens or hundreds of virtual machines and/or virtual disks are located on a shared datastore, there is no automated mechanism to assign VM or disk level policies. And there is no way to easily capture data service changes, especially in a large scale environment.

Most modern intrinsic security programs assume that infrastructure and application services are managed and assigned in a uniform and consistent manner. SPBM policies help provide consistency in infrastructure services like scheduled snapshots, replication, and placement rules. The efficacy of many other upstream security services assume that data services are delivered in a consistent manner. And the continuous compliance monitoring engine built into vSphere ensures that configuration and services drift instances are caught immediately.

Additional Resources

- [Top Reasons to use vSphere Virtual Volumes with Pure Storage](#)
- [Features that make FlashArray the Best Storage for Your vSphere Environment](#)
- [Take a Test Drive of FlashArray](#)

1 VMware Blog, "Oracle Workloads on VMware Virtual Volumes", Sudhir Balasubramanian, August 2022

2 VMware YouTube Video, "Extreme Performance Series – Oracle Performance with vVols", August 2023

3 Pure Storage White Paper "Top Reasons to Use Pure Storage FlashArray with vSphere Virtual Volumes", Sept 2023

4 VMware Blog, "On Demand Hot-extend Oracle RAC Clustered Disk using vVols", Sudhir Balasubramanian, Oct 2023

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