

ORACLE ON VMWARE vSAN

Modern Infrastructure Delivers a Powerful New Operating Model for Your Critical Applications

Oracle on HCI Powered by vSAN

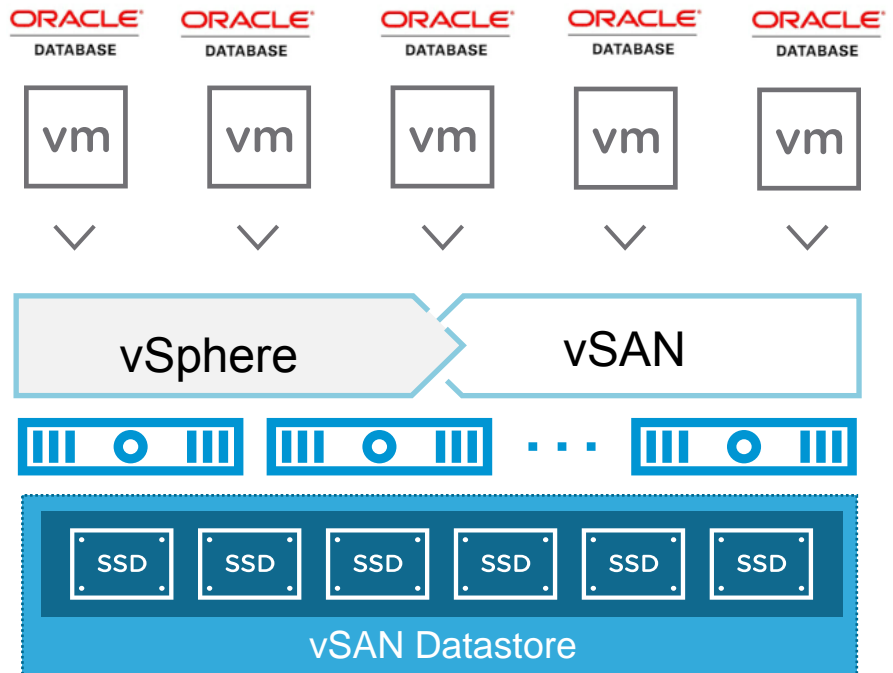
Delivering the needs of your Oracle applications with the market leading HCI software.

Virtual environments can sometimes be subject to unwanted limitations within a data center, forcing organizations to run applications within the constraints of the devices, solutions and architecture that make up the environment. Due to these limitations, organizations have traditionally procured expensive, purpose-built infrastructure that led to the creation of silos and required hardware expertise and highly manual, inefficient management and maintenance processes. In response, many companies have been turning to Hyper-Converged Infrastructure (HCI) to simplify operations and lower TCO on standardized x86 based hardware. VMware vSAN™ is an HCI software solution natively integrated with VMware vSphere®, the market-leading hypervisor. HCI clusters powered by vSAN allow administrators and application owners to deploy and run their solutions tailored to the needs of the application. Oracle database is a leading relational database management system used in business-critical applications. Oracle running on a vSAN powered cluster provides high performance, application availability, and operational flexibility while driving down costs to meet the demands of an organization for today, tomorrow and beyond.

UNIQUE CAPABILITIES

ADOPT A SIMPLIFIED, MORE EFFICIENT OPERATIONAL MODEL WITH HCI POWERED BY vSAN:

- Unified management from edge to core to cloud:** Using VMware vCenter®, manage all your Oracle workloads centrally with the same tool, regardless of where the application runs, including the public cloud.
- Run Oracle on the HCI industry's largest ecosystem:** vSAN runs on over 500+ ReadyNodes, or VxRail, an appliance jointly engineered with Dell Technologies. vSAN also has native services with AWS and IBM Cloud.
- Storage Policy Based Management (SPBM) simplifies operations:** Define desired outcomes for your Oracle workloads, and apply storage policies to achieve performance, protection, and space efficiency objectives.
- vSAN Native Encryption:** Secure Oracle database with the industry's first native, FIPS 140-2 validated HCI encryption solution.



Increased Agility Through Storage Policy Based Management (SPBM)

VMware vSAN was built around the idea of assigning storage related settings on a per VM, or even per virtual disk basis. This level of control allows for an administrator to be prescriptive to the specific Oracle server, based on its role in the data center.

MARKET LEADING AGILITY**QUICKLY ADAPT TO EVOLVING BUSINESS REQUIREMENTS**

- Adopt and integrate the very latest hardware technologies like Intel Optane™ SSD into a cluster.
- Scale up or out incrementally, as needed by an organization.
- Maintain full independence of storage from demands of other clusters. Just as with compute and memory, vSAN storage is a cluster resource that remains independent from other clusters.

You can easily increase the level of failures to tolerate on one Oracle server, while applying policies that focus on limiting I/O resources for another server running Oracle. This allows for a prescriptive level of control that is not possible with other approaches.

High Performance through Native Hypervisor Integration

The performance of an Oracle server can play a key part in delivering performance to business-critical applications. To meet the service level requirements of an application, the underlying platform must deliver consistent performance under a variety of conditions. vSAN achieves this in part through a distributed object storage system directly integrated into the hypervisor. Providing the native storage services directly into the hypervisor avoids the management complexity, I/O inefficiencies, and CPU amplification commonly found in other HCI solutions that use virtual appliances to provide storage services. This native integration allows hypervisor and cluster level activities such as snapshots, VMware vSphere High Availability (HA), and VMware vSphere Distributed Resource Scheduler™ (DRS) to be fully aware and compatible with vSAN. Running Oracle workloads on vSAN platform enables administrators to run more VMs per host with more consistent performance while maintaining the operational capabilities found in other vSphere clusters.

Optimize Storage Efficiency through Granular Controls

Some databases are used for highly transactional and repeating processes, while others are used for large data warehouses that might reflect less transactional activity, but require much more storage capacities. vSAN allows the prescriptive space efficiency settings on a cluster wide, per VM, or per VMDK basis. For example, if a certain Oracle VM (or even specific virtual disk) is particularly sensitive to latency and performing many high-volume continuous writes, it could benefit from a specific policy causing that data to be stored in resilient, low impact mirrors instead of an erasure coded set (this is referred to as “vSAN RAID 1 vs. vSAN RAID 5/6”). Conversely, development, testing, and staging systems could be configured in the more space efficient erasure coded fashion. Additionally, the data could be striped across more disks within the cluster to increase engagement and drive greater performance. Such changes can be made in real time, without the costly maintenance windows involved in rebooting or migrating VMs.

Scale in Parallel with Applications for Consistent Performance

Application scaling is an important concept, as it allows the application to scale up or out to meet the growing demands of an organization. Some Oracle use cases require large amounts of CPU, memory, and high-performance storage. vSAN allows for hosts to be scaled up, and clusters to be scaled out to meet the demands of the workloads. For example, storage can be grown incrementally by adding a disk or two to each host, smaller disks could be replaced for larger ones, or more hosts can be added to a cluster. This means that vSAN storage performance and capacity can grow incrementally and predictably as the demands and quantity of the databases grow.

LEARN MORE ABOUT ORACLE AND vSAN

- [Virtual Blocks](#) – VMware’s blog site for all topics related to storage and availability
- [StorageHub](#) – The one-stop location for all documentation on storage and availability
- Existing [Oracle on vSAN reference architectures](#)

Resilience

Oracle provides the application-level high availability through Oracle RAC and disaster recovery using Oracle data guard which can be used to compliment the enterprise class resiliency features within vSAN. The user customizable storage-level resilience is built directly into vSAN, which is suitable for even the most demanding requirements. You can easily choose levels of failure protection defined by a storage policy, and simply apply it to a VM, or virtual disk. vSAN protects beyond the disk to create resiliency at the node and cluster level, assuring your key Oracle data is well protected from many possible failure events. vSAN is self-healing, in case of failures it attempts to re-establish the full compliance of the storage protection policies assigned to the affected VM. It performs resynchronization actions automatically, all while maintaining a fair balance of resynchronization and guest VM traffic to ensure that the Oracle servers are able to maintain sufficient levels of performance at all times.

Takeaway

- The OLTP performance of Oracle database on vSAN is excellent, thanks to the rapid innovation in vSAN software and next-generation hardware.
- vSAN SPBM allows granular control for different Oracle database disks to provide a balance between space efficiency and performance.
- Adaptive resynchronization in vSAN helps deliver consistent performance while maintaining data resiliency, a key tenet for critical Oracle Databases.
- vSAN is an HCI platform that is capable of delivering scalability, resiliency, availability, and high-performance to Oracle database environments.

For more details, stay tuned for our updated solution reference architecture.

