VMware vSAN

The market-leading hyperconverged infrastructure software[1] and the next step to hybrid cloud

AT A GLANCE

Hyperconverged infrastructure (HCI) converges compute, storage and storage networking resources on industry-standard x86 servers, and uses software to abstract and pool cluster resources with unified management software. It transforms data centers by increasing agility, future-proofing infrastructure and reducing costs.

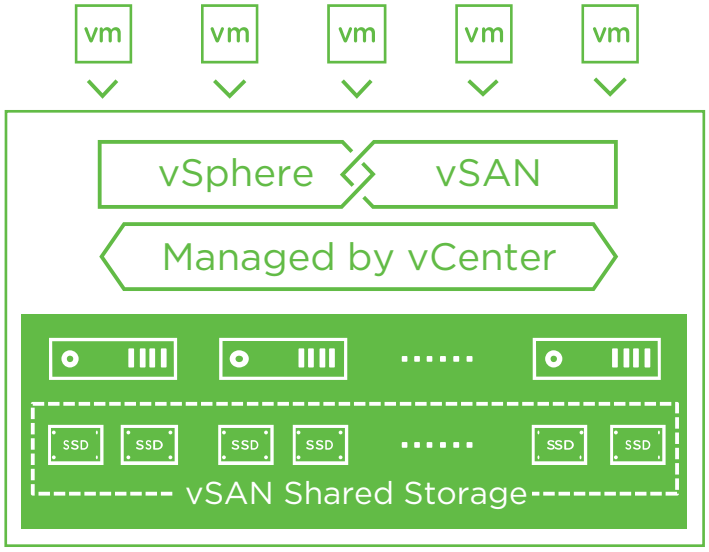
With HCI, you can increase business agility with automation, greatly reducing the need for manual intervention for common tasks, monitoring, troubleshooting and more. Converge teams to eliminate silos and accelerate decision-making. You can also increase the performance of business-critical applications because HCI supports the latest storage technologies.

HCI future-proofs your infrastructure investments. Providing a common operational model for managing compute and storage by abstracting the underlying infrastructure, HCI can extend beyond the core data center to the edge and public cloud. Its capabilities make HCI the ideal platform for managing traditional virtual machines (VMs) and next-generation application deployments.

Leveraging industry-standard x86 servers for compute and storage, HCI reduces costs by avoiding expensive, purpose-built storage and storage networking investments. As HCI scales linearly, your organization can avoid large, upfront purchases and scale incrementally as additional resources are needed.

Why VMware vSAN?

Across industries, organizations look to IT to help them stay competitive in a constantly evolving marketplace. Organizations want to evolve rapidly to keep pace with change, and they want to leverage existing tools rather than replace them. The next step for many organizations is to adopt hyperconverged infrastructure, extending the benefits of virtualization to storage while using existing tools and processes. HCI increases agility, future-proofs infrastructure and lowers storage costs.



The industry-leading HCI software stack from VMware consists of VMware vSphere® for compute virtualization, VMware vSAN™ for storage native to vSphere, and VMware vCenter® for virtual infrastructure management. VMware HCI is configurable and seamlessly integrates with VMware NSX® to provide secure network virtualization and/or VMware vRealize® Suite for advanced hybrid cloud management capabilities. HCI can be extended to the public cloud as vSAN has native services with three of the top four cloud providers: Amazon, Microsoft and IBM.

vSAN enables you to prime your business for growth through:

- Seamless evolution – vSAN is native to vSphere and requires no new tools.
- Industry-leading flexibility – The vSAN ecosystem empowers you to run HCI on certified solutions with your preferred vendor.
- Multi-cloud capabilities – vSAN provides you with consistent operations from edge to core to cloud, with intrinsic security throughout.

1. IDC. Worldwide Quarterly Converged Systems Tracker. June 25, 2019.

KEY BENEFITS

- Seamless evolution – Extend virtualization to storage with a secure, integrated hyperconverged solution that simply works with your VMware environment:
  - Is native to your hypervisor and leading public clouds
  - Use existing tools for compute and storage
  - Protect and optimize current investments
- Leading flexibility – Deploy software-defined infrastructure across your data center with the industry's largest HCI ecosystem:
  - Extend to full stack HCI and digital foundation
  - Use certified solutions with your preferred vendor
  - Unify resources under policy-based management
- Multi-cloud ready – Evolve to a common control plane, from edge to core to cloud, built on HCI:
  - Consistent operations from edge to core to cloud
  - Intrinsic security for data at rest and in flight
  - Hundreds of public cloud providers

Seamless evolution

Seamlessly evolve to HCI with the only storage native to vSphere that integrates with your overall VMware environment. vSAN simplifies your infrastructure modernization by leveraging existing tools, skillsets and software solutions. With native services to leading public cloud providers, vSAN further simplifies the extension from on premises to the public cloud. Extend virtualization beyond compute and storage with native, hypervisor-based networking virtualization and advanced management capabilities. Protect current storage infrastructure investments with the only HCI solution built on policy-based management that extends per-VM policies and automated provisioning to modern SAN and NAS systems.

Broadest flexibility

vSAN has the largest HCI ecosystem and works with your existing server vendor. vSAN has more than 500 jointly certified servers with over 15 server OEMs, as well as a jointly engineered turnkey appliance, Dell EMC VxRail. vSAN provides investment protection by supporting traditional and next-generation storage technologies, such as NVMe. vSAN also integrates with the entire software-defined data center (SDDC) stack, from edge to core to cloud, with VMware Cloud Foundation™.

Multi-cloud capable

vSAN is a critical component of VMware Cloud Foundation, an infrastructure control plane from edge to core to cloud. vSAN enables consistent processes in a true hybrid cloud architecture—no application replatforming required. Admins can use the same tools and processes used on premises to eliminate training requirements and siloed teams, and expedite time to value. The leading cloud provider network for vSAN provides access to hundreds of public cloud providers, so you can build a hybrid cloud with a vendor that meets your specific needs. Intrinsic security encrypts data at rest and at motion with a FIPS 140-2 validated encryption module, which meets stringent U.S. federal government requirements.

Key features and capabilities

Tightly integrated with vSphere – vSAN is native to vSphere, optimizing the data I/O path to provide the highest levels of performance with minimal impact on CPU and memory.

VM-centric policy-based management – vSAN is part of the larger VMware SDDC stack that uniquely delivers consistent, VM-centric operations through policy-based management. Using simple policies, common tasks are automated and storage resources are balanced to reduce management time and optimize HCI efficiency.

Single-pane-of-glass management – vSAN natively integrates with the user interface of the SDDC stack, removing the need for training and operating specialized storage interfaces. vSAN uses a modern HTML5-based web client. VMware vRealize Operations™ within vCenter enables rapid visibility into a vSAN deployment with broad monitoring and deep analytics, all from vCenter.

Flash optimized – vSAN minimizes storage latency with built-in caching on server-side flash devices, delivering up to 50 percent more IOPS than previously possible. vSAN all-flash can be deployed for less than $1 per GB of usable capacity—more than 50 percent less than the cost of competing hybrid hyperconverged solutions.

Granular, nondisruptive scale-up or scale-out – Nondisruptively expand capacity and performance by adding hosts to a cluster (scale-out) or just grow capacity by adding disks to a host (scale-up).

Deduplication and compression – Software-based deduplication and compression optimizes all-flash storage capacity, providing as much as 7x data reduction with minimal CPU and memory overhead.

Erasure coding – Increase usable storage capacity by up to 100 percent while keeping data resiliency unchanged. It is capable of tolerating one or two failures with single parity or double parity protection.

vSAN Encryption – Native to vSAN, vSAN Encryption provides data-at-rest security at the cluster level and supports all vSAN features, including space efficiency features like deduplication and compression. Enabled with a few clicks, vSAN Encryption is built for compliance requirements and offers simple key management with support for all KMIP compliant key managers, such as CloudLink, Hytrust, SafeNet, Thales, and Vormetric. vSAN Encryption is FIPS 140-2 validated, meeting stringent U.S. federal government standards.

Stretched clusters with local protection – Create a robust stretched cluster with site and local protection between two geographically separate sites, synchronously replicating data between sites. It enables enterprise-level availability where an entire site failure can be tolerated as well as local component failures, with no data loss and near zero downtime. Users can set granular protection on a per-VM basis and nondisruptively change policies—all for 50 percent lower costs than the leading traditional solution.

Quality of service (QoS) – Available in all editions of vSAN, QoS controls, limits, and monitors the IOPS consumed by specific VMs, eliminating noisy neighbor issues.

vSAN Health Service – This provides integrated hardware compatibility checks, performance monitoring, storage capacity reporting, and diagnostics directly from VMware vCenter Server®.

iSCSI access – New to vSAN 6.7, vSAN can now support Windows Server Failover Cluster (WSFC) technology, reducing data center silos by managing more business-critical applications through a single HCI solution. vSAN storage can be presented as an iSCSI target for physical workloads. All core functionality continues to be available and managed through vCenter.

vSAN Support Insight – This helps keep vSAN running in an optimal state, saving monitoring and troubleshooting time, by providing real-time support notifications and actionable recommendations. The analytics tool can also optimize performance for certain scenarios with recommended settings.

Two-node direct connect – Save up to 20 percent per site by eliminating the need for any switches between servers in a two-node deployment. Use crossover cables to simply and reliably connect the servers directly.

Full-featured PowerCLI – vSAN provides the ease and scalability of enterprise-class automation with a set of full-featured PowerCLI cmdlets. New SDK and API updates enable more enterprise-class automation by supporting REST APIs.

Built-in failure tolerance and advanced availability – vSAN leverages distributed RAID and cache mirroring to ensure that data is never lost if a disk, host, network, or rack fails. It seamlessly supports vSphere availability features, such as vSphere Fault Tolerance and vSphere High Availability. vSphere Replication™ for vSAN provides asynchronous VM replication with recovery point objectives (RPOs) of up to five minutes. New always-on features deliver a highly available management stack, independent of vCenter, and intelligent rebuilds accelerate recovery.

LEARN MORE

Learn how others are using vSAN: *Customer Stories*.

Try online for free: *vSAN Hands-on Lab*.

Request a free *vSAN Assessment* for your data center.

For more information or to purchase VMware products, call 877-4-VMWARE (outside North America, +1-650-427-5000), visit *vmware.com/products*, or search online for an authorized reseller. For detailed product specifications and system requirements, refer to the vSphere documentation.

Cloud native storage – Containers require a modern storage infrastructure approach: Storage needs to be policy driven for scalability, portable across clouds to follow the container, and operationally consistent for efficiency. With cloud native storage, developers seamlessly consume storage. vSAN cloud native storage supports all key storage API objects within Kubernetes. With minimal effort, developers can choose a policy-driven storage class for their pods and automatically mount the volume. vSAN has native services with three of the four largest public cloud providers: Amazon, Microsoft and IBM. As these environments leverage the same tools and processes as users' private clouds, data migration is as simple as using vSphere Storage vMotion®, and Kubernetes can leverage your public cloud environment as your container-based workloads scale. vSAN provides admins with a unified management plane for both VM- and container-based workloads. With granular visibility into container volumes, admins can quickly and easily control and monitor health and compliance information per volume. Admins can also rapidly troubleshoot and remediate activities; this faster support helps DevOps teams implement container-based apps even faster.

System requirements

Hardware host

- 1GB NIC; 10GB NIC recommended
- SATA/SAS HBA or RAID controller
- At least one flash caching device and one persistent storage disk (flash or HDD) for each capacity-contributing node

Cluster size

- Min. 2 hosts – Max. 64 hosts

vSAN Ready Nodes and hardware compatibility list

Available at *vmware.com/resources/compatibility*.

Software

- VMware vSphere 6.7 Update 3
- VMware vSphere with Operations Management™ 6.1 (any edition)
- VMware vCloud Suite® 6.0 (any edition updated with 6.5)
- VMware vCenter Server 6.7 Update 3

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