



# VMWARE vSAN 6.6

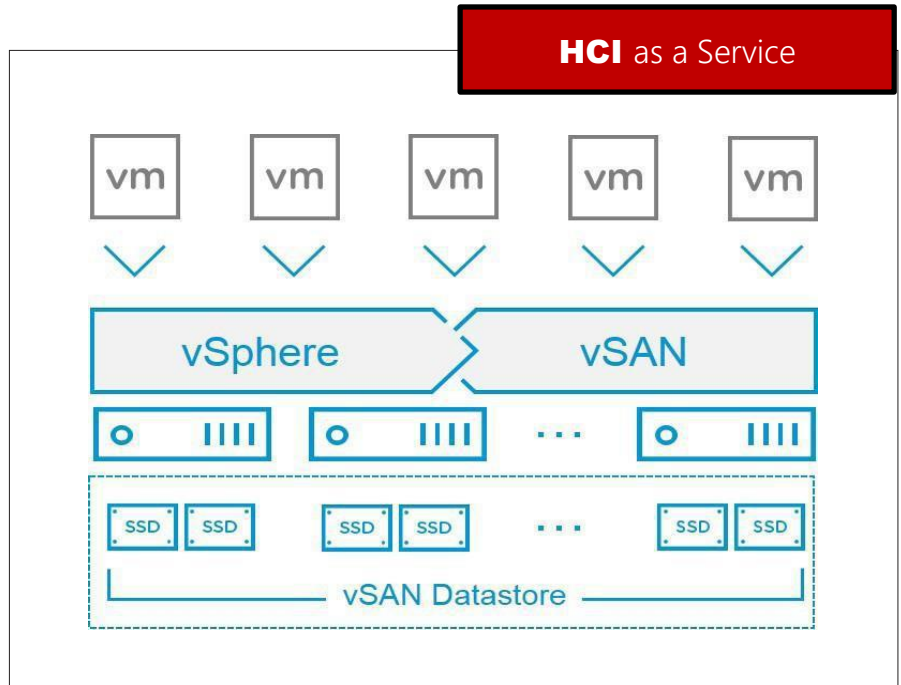
## Evolve without Risk to Hyper-Converged Infrastructure

### AT A GLANCE

Accelerate infrastructure modernization with VMware vSAN™ to make it a strategic, cost-effective advantage for your company. By powering the leading Hyper-Converged Infrastructure (HCI) solutions, vSAN helps service providers evolve their data center without risk, control IT costs and scale to tomorrow's business needs.

vSAN, native to the market-leading hypervisor, delivers flash-optimized, secure storage for all of your critical vSphere workloads. vSAN is built on industry-standard x86 servers and components that help lower TCO by up to 50% versus traditional storage. It delivers the agility to easily scale IT and offers the industry's first native HCI encryption.

New, enhanced stretch clusters and intelligent, one-click operations further lower costs for affordable site protection (50% less than leading traditional solutions) and simple day-to-day management. Seamless integration with VMware vSphere and the entire VMware stack makes it the simplest storage platform for virtual machines – whether running business critical applications, virtual desktops or next-generation applications.



### Why VMware vSAN?

Every business initiative today is an IT project, and most likely multiple IT projects. As a result of this ongoing digital transformation, IT needs a simpler and more cost-effective approach to their data center infrastructure – one that does not require all new training and skills.

As the only vSphere-native software-defined storage platform, vSAN helps service providers evolve to a hyper-converged infrastructure (HCI) without risk while lowering IT costs and providing an agile solution ready for future hardware, cloud and application changes. vSAN delivers flash-optimized, secure storage with the industry's first native HCI encryption solution – at a fraction of the cost of traditional, purpose-built storage and less efficient HCI solutions.

vSAN pools together server-attached storage to provide a highly resilient shared datastore suitable for any virtualized workloads, including business-critical applications, databases, virtual desktops, management, and cloud management platform clusters.

## KEY BENEFITS

- Evolve without Risk: Seamlessly extend virtualization to storage with a secure, integrated hyper-converged solution that simply works with your VMware environment.
  - Use existing management tools, skillsets, and hardware platform of choice.
  - Capitalize on VMware's large, proven ecosystem for complementary software solutions.
  - Secure data with the industry's first native HCI encryption solution.
- Reduce TCO: Make limited budgets go farther with 50% lower total cost of ownership by consolidating core data center functions on the broadest choice of industry-standard x86 hardware and the most proven hypervisor.
  - Shift infrastructure to low-cost, high-volume server economics.
  - Simplify management with one, integrated software stack.
  - Deploy robust, flexible stretched clusters for affordable site protection.
- Scale to Tomorrow: Prepare for tomorrow's IT needs in the cross cloud era with software-defined infrastructure that leverages the latest hardware technologies, supports next-gen applications, and provides a stepping-stone to the cloud.
  - Rapidly support the latest hardware technology.
  - Built for modern enterprise applications and containers.
  - One platform architected for the multi-cloud era.

**Architecture and Performance:** Tightly integrated with the hypervisor, vSAN sits directly in the I/O data path, in the best position to make rapid data placement decisions. As a result, vSAN is able to deliver the highest levels of performance without taxing CPU or memory resources, as compared to other virtual storage appliances and HCI software stacks that run separately, on top of the hypervisor. vSAN can be configured as all-flash or hybrid storage, delivering up to 6M IOPS with an all-flash architecture.

**Storage Efficiency:** vSAN delivers advanced storage features, including deduplication, compression, and erasure coding (RAID 5/6), capable of delivering up to 10 times greater storage utilization with dramatically lower storage capacity and costs. The efficiency features work together seamlessly under any workload with minimal additional resource overhead, a significant advantage compared to other hyper-converged solutions.

**Scalability:** vSAN has a distributed architecture that allows for grow-as-you-go, nondisruptive scaling from 2 to 64 hosts per cluster. Both capacity and performance can be scaled at the same time by adding a new host to the cluster (scale out); or capacity and performance can be scaled independently by merely adding new drives to existing hosts (scale up).

**Management and Integration:** vSAN does not require any additional software to be installed—it can be enabled in a few, simple clicks. It is managed from the VMware vSphere® Web Client and integrates with the VMware stack including key features like Storage vMotion®, High Availability (HA), and Fault Tolerance (FT) as well as other VMware products such as VMware Site Recovery Manager™ and VMware vRealize® Operations™.

**Security:** vSAN offers the industry's first native HCI security solution with data-at-rest encryption. Built right into vSAN, vSAN encryption supports the service provider's choice of standard drives (SSDs and HDDs), avoiding the limited options and pricing premium of self-encrypting drives (SEDs). Designed for compliance requirements, vSAN supports 2-factor authentication (SecurID and CAC), and offers the first DISA-approved STIG for HCI.

**Automation:** VM storage provisioning and storage service levels (e.g., capacity, performance, availability) are automated and controlled through VM-centric policies that can be set or modified on the fly. vSAN dynamically self-tunes, adjusting to ongoing changes in workload conditions to load balance storage resources, ensuring each VM adheres to the storage policies defined for it.

## Key Features and Capabilities

**Tightly Integrated with vSphere:** vSAN is built into the vSphere kernel, optimizing the data I/O path to provide the highest levels of performance with minimal impact on CPU and memory.

**Flash Optimized:** vSAN minimizes storage latency with built-in caching on server-side flash devices. New vSAN 6.6 optimizations deliver up to 50% more IOPs than previously possible. vSAN all-flash can be deployed for less than the cost of competing hybrid hyper-converged 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 a sevenfold data reduction with minimal CPU and memory overhead.

Erasure Coding: Erasure coding increases usable storage capacity by up to 100% 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.

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% lower costs than the leading traditional solution.

Quality of Service (QoS): Now available in all editions of vSAN, QoS controls, limits, and monitors the IOPS consumed by specific virtual machines, eliminating noisy-neighbor issues.

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

iSCSI Access: vSAN storage can be presented as an iSCSI target for physical workloads. All core functionality continues to be available and managed through vCenter.

vSAN Cloud Analytics: vSAN Cloud Analytics 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.

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.

Single pane of glass management with vSphere: vSAN removes the need for training and operating specialized storage interfaces. Provisioning is now as easy as two clicks, and the new one-click hardware lifecycle management can cut common tasks by up to 80%.

VM-centric policy-based management: vSAN uses storage policies, applied on a per-VM basis, to automate provisioning and balancing of storage resources to ensure that each virtual machine gets the specified storage resources and services.

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 like vSphere Fault Tolerance and vSphere High Availability, etc. VMware vSphere® Replication™ for vSAN provides asynchronous VM replication with recovery point objectives (RPOs) of up to 5 minutes. New always-on features deliver a highly available management stack, independent of vCenter, and intelligent rebuilds accelerate recovery.

## Deployment Options

vSAN is available via a broad set of consumption models—offering five times as many options as competing HCI solutions. Choose from the jointly engineered VxRail appliance, providing the most streamlined deployment of vSAN-powered HCI, or from almost two hundred precertified VMware vSAN Ready Node™ configurations, available from all major server vendors.

#### LEARN MORE

Learn how other service providers are using vSAN:  
Service Provider [Customer Stories](#).

Try online for free: [vSAN Hands-on Lab](#)

Request a free [vSAN Assessment](#) for your  
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visit <http://www.vmware.com/products>, or search  
online for an authorized reseller. For detailed  
product specifications and system requirements,  
refer to the vSphere documentation.

## Photon Platform with vSAN

VMware Photon™ Platform is an enterprise cloud infrastructure platform that enables IT to deliver on-demand tools and services that developers need to build and run modern applications while retaining security, control, and performance of the data center. Purpose-built for cloud-native applications with natively integrated enterprise container infrastructure support, the Photon Platform brings the scale, performance, and features previously accessible only to hyper-scale web companies into the service provider's data center.

Photon Platform is natively integrated with VMware's leading networking and storage technologies. The platform delivers virtual networking on demand and leverages hyper-converged storage using vSAN. The vSAN storage services have been engineered for Photon Platform to provide complete management access for developers exclusively via APIs. As a result, Photon Platform users can benefit from the core storage services available in vSAN and minimize risk with a proven, persistent storage solution.

## 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 [here](#).

## Software

- VMware vSphere 6.5 (any edition)
- VMware vCenter Server 6.5

