# VMware vSAN

## The market-leading hyperconverged infrastructure software[1] and your first step to hybrid cloud

### HCI 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.

With HCI, you can increase business agility with automation, reducing the need for manual intervention for common tasks, while eliminating silos and accelerating 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 the public cloud. Its capabilities make HCI the ideal platform for managing traditional virtual machines (VMs) and next-generation application deployments.

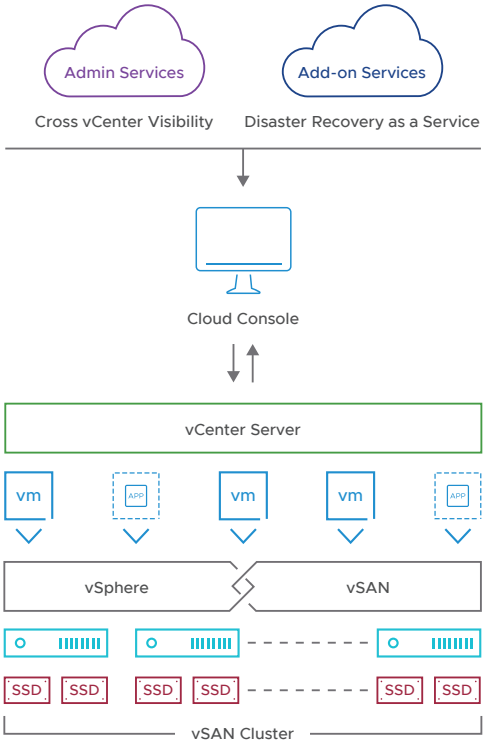
Leveraging industry-standard x86 servers for compute and storage, HCI reduces costs by avoiding expensive, purpose-built storage and storage networking investments. As HCI scales linearly, your organization can avoid large, upfront purchases and scale incrementally as additional resources are needed.

### Future-proof your data center with HCI

In today's technology-driven landscape, digital goods and services drive the modern business. Organizations across industries rely on IT to provide them with the infrastructure needed to deliver these digital experiences, meet changing demands, and maintain a competitive edge. As time-to-market expectations accelerate and greater numbers of mission-critical applications move outside the core data center, IT must evolve toward a cloud operating model to achieve the speed, agility and cost advantages that business leaders desire.

The first step for many organizations is to adopt hyperconverged infrastructure, extending the benefits of a cloud operational model to storage while optimizing investments in existing tools and processes. HCI increases agility, future-proofs infrastructure, and lowers storage costs.

### The industry's leading HCI software stack




1. IDC. Worldwide Quarterly Converged Systems Tracker. December 12, 2019.

## Key benefits

- Deliver a cloud operational model to every IT environment
- Scale rapidly and flexibly with growing demands for containers, VM-based workloads, and cloud native applications
- Optimize performance without compromising storage efficiency
- Maximize resource utilization and infrastructure investment
- Take advantage of a flexible subscription model to purchase resources as your business needs them
- Achieve unified management and operations across varying workloads and storage tiers
- Reduce IT costs through both CapEx and OpEx savings

## Learn more

Visit Tech Zone to take a technical deep dive into vSAN.

Read customer stories to learn how others are using vSAN.

Explore the added benefits of storage disaggregation with VMware HCI Mesh.

Try vSAN online for free with VMware Hands-on Labs.

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.

VMware's industry-leading software stack includes:

- VMware vSphere® for compute virtualization
- VMware vSAN™ for storage integrated with vSphere
- VMware vCenter® for virtual infrastructure management

VMware HCI is highly configurable and seamlessly integrates with:

- VMware NSX® to provide secure network virtualization
- VMware Aria Suite™ (formerly VMware vRealize® Suite) for optional advanced hybrid cloud management capabilities

VMware vSAN brings the power of cloud to your storage with vSphere integration for consistent application performance and high consolidation ratios. Meet today's business requirements with agile HCI that allows you to scale flexibly with subscription licensing, simplify operations with highly automated workflows and cloud services, accelerate time to market, and reduce costs.

Next-generation architecture designed for high-performing devices future-proofs your data center and enables you to optimize performance without compromising space efficiency. VMware HCI is cloud connected to support any application or use case in a hybrid cloud architecture and speeds cloud adoption with consistent infrastructure and operations with all the global hyperscalers, including Amazon, Microsoft, Google, IBM, Alibaba and Oracle.

## Key features and capabilities

Flexible scaling – vSAN provides flexible scaling, with as few as 2 nodes (plus witness) and up to 64 nodes in a cluster. Scale out by adding nodes to a cluster, scale up by adding nodes to drives, or create storage-dense clusters via VMware HCI Mesh™ to disaggregate compute and storage resources. Scale compute and storage independently and precisely, across any topology, to meet application needs and optimize resource utilization.

Accelerated cloud native app development – With minimal effort, developers can seamlessly consume storage by choosing a policy-driven storage class for their pods and automatically mounting the volume. vSAN cloud native storage supports all key storage API objects within Kubernetes, and powers both block-centric and file-centric microservice-based applications. vSAN provides admins with a comprehensive, single-UI view to manage storage used by containers across multiple orchestrators.

Integrated file services – Easily provision a file share with a single workflow, and use vSAN as a unified storage control plane for both block and file storage. vSAN file services integrate Active Directory and support Kerberos network authentication and the most common protocols. vSAN file services can be used in two-node deployments and stretched cluster deployments.

## System requirements

### Hardware host

- 1GB NIC; 10GB or larger 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

Available at vmware.com/resources/compatibility.

### Software

- VMware vSphere 7.0
- VMware vSphere with Operations Management™ 6.1 (any edition)
- VMware vCloud Suite® 6.0 (any edition updated with 6.5)
- VMware vCenter Server® 7.0

### vSAN Express Storage Architecture

- CPU: 32 cores or more
- Memory: 512 GB or more
- Networking: 25 GbE or higher
- Capacity: 15 TB or higher
- Devices: 4 or more NVMe TLC SSDs, mixed-use (3 DWPD or higher)

vSAN Express Storage Architecture does not require separate caching devices.

For more details, please refer to the vSAN Hardware Compatibility guide.

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. vSAN offers the ability to turn on compression for only those environments where space efficiency must be balanced with performance requirements.

Powerful stateful services – The vSAN Data Persistence platform provides a framework for modern stateful service providers to integrate cloud native applications into the underlying virtual infrastructure leveraging the Kubernetes operator method and the vSphere Pod Service™.

VM-centric policy-based management – vSAN is part of the larger VMware Cloud Foundation™ stack that uniquely delivers consistent, VM-centric operations through policy-based management. Within the vSAN Express Storage Architecture™, per-VM policies increase flexibility of management, enabling compression policies or customize data services on a per-VM basis.

For a complete list of vSAN features, see the features by version matrix.

## vSAN Express Storage Architecture enhancements

In addition to all the benefits provided by vSAN, vSAN Express Storage Architecture boasts additional enhancements to optimize next-generation storage devices, including the following.

Performance without trade-off – Store data using RAID6 at the performance of RAID1. Achieve up to 4x higher performance for your most demanding workloads while maintaining the highest levels of data protection and space efficiency.

Ready-for-anything resilience – By removing disk groups and advancing to a storage pool construct, vSAN Express Storage Architecture reduces failure domains and further improves availability.

Native data protection – Native snapshots within vSAN Express Storage Architecture enable rapid data protection with up to 100x faster operations. Seamlessly connect to third-party backup solutions via an API for an easy-to-use experience to enhance data protection and backup management.

Lower storage costs with supreme resource and space efficiency – Optimized compression methods deliver up to 4x better compression ratios and up to 70 percent extra usable capacity, further improving space savings and efficiency. A single-tier architecture enhances the overall efficiency of storage as all storage devices contribute to capacity.

Resource-intensive workloads, such as mission-critical applications, database workloads, OLTP, DevOps, cloud native applications, video applications, and edge deployments, are ideal use cases for vSAN Express Storage Architecture.