



# VMware vSAN 6.5

## Licensing Guide

Revised November 2016



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## Introduction

VMware, the leader in Hyper-Converged Infrastructure (HCI), enables the lowest cost and highest performance next-generation HCI solutions powered by VMware vSAN™. The natively integrated software solution combines radically simple vSAN storage with the industry-standard VMware vSphere® hypervisor and the VMware vCenter Server™ unified management solution.

vSAN 6.5 delivers the industry's best storage value with ease of management, high performance, low cost, and a future-proof roadmap supporting any app, any scale. vSAN pools server-attached solid-state flash devices to create a distributed shared datastore that abstracts the storage hardware and provides a hyper-converged storage optimized for virtual machines. It is transformational technology that delivers unique value to VMware customers:

- Radically Simple - Deploy easily through the vSphere web client and automate management using storage policies
- Elastic Scalability - Scale out or up performance and capacity by adding a new host to the cluster or new drives to existing hosts. Start small with 2 physical host and scale all the way to 64 physical hosts per cluster.
- High Performance - embedded in the hypervisor, vSAN can deliver millions of IOPS with predictable low latencies.
- 20-50% Lower TCO - Reduce flash capacity utilization with deduplication, compression, and erasure coding. 2-node configurations connected with cross-over cables eliminates the need for expensive switching hardware in use cases such as remote offices.

Customers of all industries and sizes trust vSAN to run their most mission critical applications such as Microsoft SQL Server, SAP, and Oracle Database. vSAN 6.5 adds iSCSI support for clustered application and physical workloads.

vSAN is compatible with any edition of vSphere and it is available in multiple packages to accommodate a variety of specific needs and use cases. This guide explains the vSAN licensing editions, discusses some vSAN configuration options at a high level, and provides a number of examples to further illustrate potential licensing scenarios.

## Licensing Editions

Let's start with the vSAN licensing editions. They are Standard, Advanced, Enterprise, and Remote Office/Branch Office (ROBO) Standard and Advanced. The following table shows the features included with each license edition.

vSAN Product Feature	Standard	Advanced	Enterprise	ROBO Std.	ROBO Adv.
Storage Policy Based Mgmt.	✓	✓	✓	✓	✓
Flash Read/Write Caching	✓	✓	✓	✓	✓
Distributed RAID	✓	✓	✓	✓	✓
Virtual Distributed Switch	✓	✓	✓	✓	✓
vSAN Snapshots & Clones	✓	✓	✓	✓	✓
Rack Awareness Availability	✓	✓	✓	✓	✓
vSphere Replication	✓	✓	✓	✓	✓
Software Checksum	✓	✓	✓	✓	✓
All-Flash Hardware	✓	✓	✓	✓	✓
iSCSI Target Service	✓	✓	✓	✓	✓
Deduplication & Compression		✓	✓		✓
RAID-5/6 Erasure Coding		✓	✓		✓
Stretched Cluster			✓		
QoS IOPS Limits			✓		

Figure 1: License Editions and Product Features

Note: The deduplication & compression and RAID-5/6 erasure coding features require an all-flash vSAN configuration. These features are not supported with hybrid vSAN clusters.

Standard licensing includes support for hybrid configurations – magnetic disks for capacity, flash devices for caching – and all-flash configurations. This change from the vSAN 6.2 licensing model enables the use of all-flash hardware while minimizing licensing costs. It is important to note that Standard licensing does not include support for deduplication, compression, and erasure coding. Advanced licensing is required for these space efficiency features. The Enterprise license builds on the features included with vSAN Standard and Advanced by adding support for stretched cluster configurations and limiting IOPS on a per-object basis.

vSAN Standard, Advanced, and Enterprise editions are licensed per-CPU (socket). These are standalone licenses (i.e. not included with any other VMware license such as VMware vSphere®, vSphere with Operations Management™, VMware vCloud Suite®, and so on). Any type of workload – server and desktop – can be run on a vSAN cluster with these licensing editions.

A vSphere host that is not contributing local storage to a vSAN datastore can be a member of the vSAN cluster and utilize the vSAN datastore. Even though a host is not contributing storage, the host must be licensed for vSAN.

## Virtual Desktop Infrastructure

vSAN for Desktop licensing is available for customers using vSAN exclusively for virtual desktop infrastructure (VDI). This includes third-party VDI solutions in addition to VMware Horizon®. While this limits the use of vSAN to VDI workloads only, vSAN for Desktop provides unique pricing and packaging options to help further reduce the cost of VDI while enabling the benefits and performance of a distributed storage platform. vSAN for Desktop is available in Standard, Advanced, and Enterprise editions. It is priced per-concurrent user (CCU) in a virtual desktop environment and sold in packs of 10 and 100 licenses. vSAN for Desktop Advanced licenses are included with [VMware Horizon Advanced Edition and Enterprise Edition](#).

## Upgrades

Customers that would like to upgrade an existing vSAN license edition to a higher edition to enable additional functionality can purchase upgrades. For example, an organization that currently utilizes vSAN 6.5 Advanced edition can purchase an upgrade to the Enterprise edition to enable a stretched cluster architecture. The following list shows upgrade options:

- Standard to Advanced (per-CPU)
- Standard to Enterprise (per-CPU)
- Advanced to Enterprise (per-CPU)
- Standard for Desktop to Advanced for Desktop (CCU 10-pack and 100-pack)
- Standard for Desktop to Enterprise for Desktop (CCU 10-pack and 100-pack)
- Advanced for Desktop to Enterprise for Desktop (CCU 10-pack and 100-pack)
- Standard for ROBO to Advanced for ROBO (per-VM 25-pack)

NOTE: Availability and pricing can change without warning. It is always best to consult with your preferred reseller to get current pricing and packaging options for any VMware solution.

## Remote Office / Branch Office

vSAN is also an excellent solution for remote office and branch office (ROBO) implementations, as described in this solution brief: [VMware vSAN Remote Office/Branch Office Deployment](#). vSAN for ROBO licenses are priced per-virtual machine (per-VM) and sold in packages of 25 licenses. A 25-pack of licenses can be shared across multiple locations – for example, five remote offices each running five virtual machines. This approach provides deployment flexibility and helps minimize the cost of smaller infrastructures commonly found at remote offices.

Each remote office is limited to a maximum of 25 virtual machines under the vSAN for ROBO licensing model. If more than 25 virtual machines are running at a remote office, vSAN Standard, Advanced, or Enterprise licensing must be used. Any number of hosts can be licensed with vSAN for ROBO Standard or Advanced as long as the number of virtual machines running on a vSAN cluster at a single location is 25 or less.

It is possible to start with vSAN for ROBO licenses and then switch to vSAN Standard, Advanced, or Enterprise licenses without disruption when a remote office grows beyond 25 virtual machines. The definition of a remote office or branch office from a VMware standpoint is any remote physical location other than a primary data center. It is important to note there is no upgrade/conversion path from vSAN for ROBO per-VM licenses to vSAN Standard, Advanced, and Enterprise per-CPU licenses.

Another important item to discuss is the deployment of a 2-host architecture at the same location, which is supported and common in ROBO implementations. A 2-host or “2-node” architecture consists of two physical vSphere hosts in a cluster at the same location running vSAN. The two physical hosts can be connected to a network switch or connected directly using network crossover cables. As with many clustering technologies, a third node is required to serve as a “tie-breaker” in situations such as the loss of network connectivity between the two physical hosts. This third system is commonly called a “witness”. vSAN utilizes a virtualized vSphere host, a virtual machine appliance running ESXi, as the witness for a 2-host vSAN cluster.

The example below shows a main data center and three remote offices. Each remote office has a 2-host vSAN cluster and a witness for each cluster is hosted at the main data center.

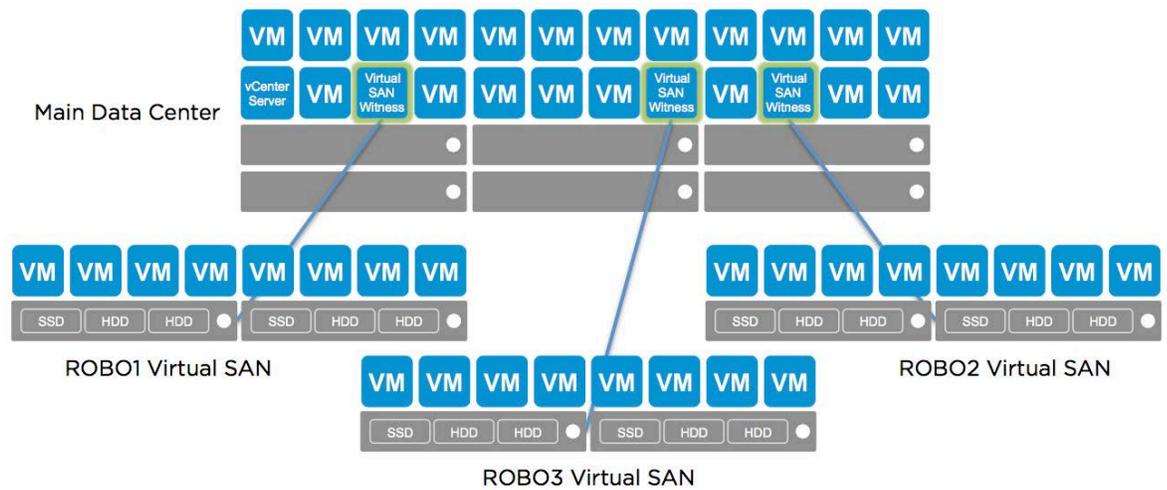


Figure 2: vSAN ROBO Deployment

The vSAN witness includes licensing so there is no need to purchase licenses for a vSAN witness. The diagram below shows the selection of the vSAN witness license, “License 1”, when adding the witness to the cluster.

Licenses				
License	License Key	Product	Usage	
<input checked="" type="radio"/> License 1	NH2HM-XXXXX-XXXXX-XXXXX-28DNP	VMware vSphere 6 for Vi...	2 CPUs	
<input type="radio"/> VSOM Ent Plus	4J2J6-	VMware vSphere with O...	0 CPUs	

Figure 3: vSAN Witness License

The 2-host vSAN deployment model is not restricted to a specific vSAN license edition. In other words, any of the licensing editions can be used with a 2-host configuration.

## Stretched Cluster

The stretched cluster feature is available with the Enterprise edition of vSAN 6.5. A vSAN stretched cluster also utilizes a witness and commonly consists of more than two physical hosts distributed across two separate locations. The witness must be placed at a third location to serve as the “tie-breaker” when the network connection is disrupted between the two locations that contain data. The vSAN stretched cluster feature supports latencies up to 5ms round trip time (RTT) between the two data locations. Latencies up to 200ms RTT are supported between a data location and the witness. The following illustration shows an 8-host stretched cluster.

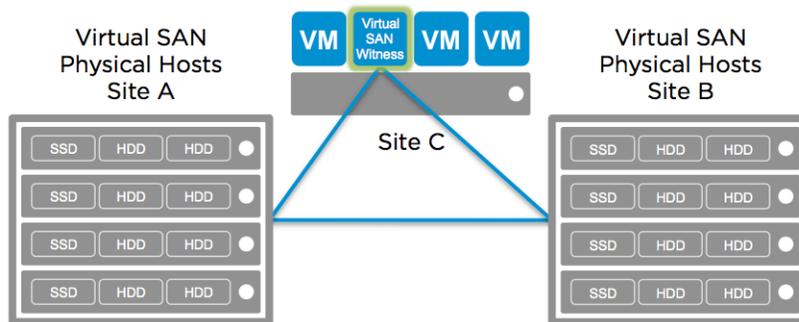


Figure 4: vSAN Stretched Cluster

## Examples

This section contains several example vSAN implementation scenarios and vSAN licensing for these scenarios. All scenarios utilize hosts that have two populated CPU sockets unless otherwise noted. A cluster of hosts with magnetic disks for the capacity tier is commonly called a “hybrid” cluster. A cluster of hosts with flash devices in the capacity tier is referred to as an “all-flash” cluster.

**Scenario 1:** 4-host all-flash vSAN cluster in a primary data center that is used to run server workloads.

This cluster requires eight vSAN Standard licenses. If deduplication, compression, and erasure coding are required, vSAN Advanced licenses are needed.

**Scenario 2:** 8-host all-flash vSAN cluster virtual desktops with 90 concurrent users.

vSAN for Desktop Advanced licenses (one CCU 100-pack) would likely be the best choice although it is possible to license this cluster with vSAN for Desktop Standard licenses. Both license editions support the use of all-flash hardware. Advanced licenses enable the use of deduplication, compression, and erasure coding. These space efficiency features typically provide a considerable reduction in TCO.

Note: vSAN for Desktop Advanced licenses are included with Horizon Advanced and Enterprise licenses. The virtual servers that support virtual desktops, e.g., Horizon View Connection Server can also run on this cluster when vSAN for Desktop licenses are used.

**Scenario 3:** 20-host hybrid vSAN configuration running a combination of desktop workloads and server workloads other than the servers supporting virtual desktops in a primary data center.

40 vSAN Standard per-CPU licenses are required to properly license this cluster. Even though there are some virtual desktops running in this cluster, vSAN for Desktop licensing cannot be used, as there are also non-desktop workloads present.

**Scenario 4:** 2-host all-flash vSAN cluster running 10 virtual machines in a remote office.

There are less than 25 virtual machines running at this office, which means vSAN for ROBO Standard licenses can be used. vSAN for ROBO Advanced licenses would enable deduplication, compression, and erasure coding features.

**Scenario 5:** Five remote offices each with a 2-host hybrid vSAN cluster in one rack running 10 virtual machines. In other words, a total of 50 virtual machines evenly distributed across five remote offices.

Similar to Scenario 4, the remote offices run less than 25 virtual machines at each location. A total of 50 vSAN for ROBO Standard per-VM licenses are needed. This license edition is sold in packages of 25 and the licenses can be spread across remote offices. Two vSAN for ROBO Standard 25-packs are sufficient to cover the 50 virtual machines across the five remote offices.

**Scenario 6:** 3-host all-flash vSAN cluster at a remote office running 30 virtual machines.

vSAN for ROBO licenses cannot be used in this scenario because the number of virtual machines is more than 25. Six vSAN Standard per-CPU licenses are needed as there are three hosts each with two CPUs. vSAN Advanced licenses would enable deduplication, compression, and erasure coding seeing that the cluster is an all-flash configuration. However, a minimum of four hosts are required for erasure coding.

**Scenario 7:** Three remote offices each with a 2-host hybrid vSAN cluster. The first remote office is running 10 virtual machines. The second remote office is running 12 virtual machines. The third remote office is running 28 virtual machines.

A 25-pack of vSAN for ROBO Standard licenses would cover the first and second remote offices. The third remote office would require four vSAN Standard licenses as there are more than 25 virtual machines running at this location.

**Scenario 8:** Remote office licensed with vSAN for ROBO Standard (per-VM 25-pack) originally running 20 server VMs on three physical hosts. The number of VMs has grown to 30.

vSAN for ROBO licenses enable up to 25 VMs to be licensed at a single remote office location. In this scenario, the number of VMs at the remote office has grown beyond the 25 VM limit. The vSAN for ROBO licenses must be replaced with per-CPU licenses (vSAN Standard, Advanced, or Enterprise). There is no upgrade path or conversion from vSAN for ROBO to vSAN per-CPU licenses. The vSAN for ROBO licenses can be redeployed at another remote office location.

**Scenario 9:** 24-host all-flash vSAN configuration in one location. The Quality of Service IOPS limiting feature is required to control the resource consumption of some virtual machines.

48 vSAN Enterprise per-CPU licenses are needed since there is a requirement to use the IOPS limiting feature.

**Scenario 10:** 12-host all-flash vSAN cluster at a primary data center or remote office with four racks. Each rack contains three hosts. A combination of 200 server and desktop workloads are running on this cluster.

24 vSAN Advanced per-CPU licenses are required for this scenario. Although the physical hosts are distributed across multiple racks, the hosts are well connected with network latencies of less than 1ms RTT. Rack Awareness Availability can be used help minimize downtime due to rack failure.

**Scenario 11:** 12-host vSAN stretched cluster with six hosts at a primary location and six hosts at a secondary location. A vSAN witness (virtual appliance) is deployed to a third location to serve as a "tie-breaker."

This scenario requires 24 vSAN Enterprise per-CPU licenses. The witness virtual appliance includes a vSAN license.

## Summary

- vSAN works with any edition of vSphere.
- vSAN Standard, Advanced, and Enterprise licenses are per-CPU (socket) licenses. All hosts in the cluster must be licensed.
- All-flash vSAN configurations are supported with the Standard license. Deduplication, compression, and erasure coding require Advanced or Enterprise licenses.
- Stretched cluster configurations require Enterprise licenses.
- vSphere, vSphere with Operations Management, and vCloud Suite licenses do not include vSAN.
- vSAN for Desktop are concurrent user (CCU) licenses available in a pack of 10 and 100.
- vSAN for ROBO are per-VM licenses available in a pack of 25.
- vSAN for ROBO licenses can be spread across multiple remote offices.
- Only one vSAN for ROBO Standard or Advanced 25-pack of licenses can be used at a remote office. Running more than 25 virtual machines at a single remote office location disqualifies the use of vSAN for ROBO licensing at that location.
- vSAN for Desktop licenses can only be used to run virtual desktop workloads.
- VMware Horizon Advanced and Enterprise licensing includes vSAN Advanced licenses to run virtual desktops workloads only.
- A 2-host vSAN cluster at a single location with a witness at a secondary location can be deployed with any license edition.
- Any cluster with two or more physical hosts deployed across two locations plus a witness (virtual appliance or physical host) at a third location is considered a stretched cluster, which requires vSAN Enterprise licensing.
- vSAN upgrade licenses are available for per-CPU licenses, vSAN for Desktop licenses, and vSAN for ROBO licenses (see "[Upgrades](#)" on page 5 of this document).