



VMware Virtual SAN 6.2

Licensing Guide

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Introduction

VMware, the market leader in powering Hyper-Converged Infrastructure (HCI), enables the lowest cost and highest performance next-generation HCI solutions through proven VMware Hyper-Converged Software. The natively integrated software combines radically simple VMware Virtual SAN™ storage, the marketing-leading VMware vSphere® hypervisor, and the VMware vCenter Server™ unified management solution with the broadest and deepest set of HCI deployment choice.

Virtual SAN 6.2 delivers the industry's best storage value with radically simple management, high performance, low cost and a future-proof roadmap supporting any app, any scale. Virtual SAN pools server-attached magnetic disks and 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 3 hosts and scale all the way to 64 hosts per cluster.
- High Performance – being embedded in the hypervisor Virtual SAN can deliver up to 7M IOPS with all flash or 2.5M IOPS with hybrid
- Lower TCO – Reduce capacity utilization with near-line deduplication, compression, and erasure coding with all-flash configurations.

Customers of all industries and sizes trust Virtual SAN to run their most mission critical applications such as Microsoft SQL Server, SAP, and Oracle Database. Virtual SAN 6.2 adds greater abilities around availability, monitoring, and management that can perform in the most demanding environments.

Virtual SAN 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 Virtual SAN licensing editions, discusses some Virtual SAN 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 Virtual SAN licensing editions. They are Standard, Advanced, Enterprise, and Remote Office/Branch Office (ROBO). The following table shows the features included with each license edition.

Virtual SAN Product Feature	Standard	Advanced	Enterprise	ROBO
Flash Read/Write Caching	✓	✓	✓	✓
Storage Policy Based Management	✓	✓	✓	✓
Distributed RAID	✓	✓	✓	✓
Replication	5-min. RPO	5-min. RPO	5-min. RPO	5-min. RPO
vRealize Operations MPSD	✓	✓	✓	✓
High Performance Snapshots	✓	✓	✓	✓
Virtual Distributed Switch	✓	✓	✓	✓
Rack Awareness Availability	✓	✓	✓	✓
All Flash		✓	✓	
Deduplication and Compression		✓	✓	
RAID-5/6 Erasure Coding		✓	✓	
Quality of Service IOPS Limits			✓	
Stretched Cluster			✓	

Figure 1: License Editions and Product features

The Advanced license builds on the features included with Standard by adding support for space efficiency features such as deduplication, compression, and RAID-5/6 erasure coding. These space efficiency features require all-flash Virtual SAN configurations. A new licensing edition, Virtual SAN Enterprise, was added with Virtual SAN 6.2. The Enterprise edition includes the Standard and Advanced features plus support for stretched clusters and limiting IOPS on a per-object basis. For details on each of these features, please see the [Virtual SAN features web page](#).

Virtual SAN 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 Virtual SAN cluster with these licensing editions.

Virtual Desktop Infrastructure (VDI)

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

Upgrades

Organizations with Virtual SAN 6.1 Advanced licenses and current Support and Subscription Services (“SnS”) are entitled to the Enterprise edition of Virtual SAN when they upgrade to Virtual SAN 6.2.

Customers that would like to upgrade an existing Virtual SAN 6.2 license edition to a higher edition to enable additional functionality can purchase upgrades. For example, an organization that currently utilizes Virtual SAN 6.2 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 Desktops to Advanced for Desktops (CCU 10-pack and 100-pack)
- Standard for Desktops to Enterprise for Desktops (CCU 10-pack and 100-pack)
- Advanced for Desktops to Enterprise for Desktops (CCU 10-pack and 100-pack)

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

Remote Office / Branch Office (ROBO)

Virtual SAN is also an excellent solution for remote office and branch office (ROBO) implementations, as described in this solution brief: [VMware Virtual SAN Remote Office/Branch Office Deployment](#). Virtual SAN 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 Virtual SAN for ROBO licensing model. If more than 25 virtual machines are running at a remote office, Virtual SAN Standard, Advanced, or Enterprise licensing must be used. It is possible to start with Virtual SAN for ROBO licenses and then switch to Virtual SAN 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 path from Virtual SAN for ROBO per-VM licenses to Virtual SAN Standard, Advanced, and Enterprise per-CPU licenses.

Another important item to discuss from a licensing perspective is the deployment of a 2-host architecture, which is supported and common in ROBO implementations. A 2-host architecture consists of two physical vSphere hosts running Virtual SAN. As with many clustering technologies, a third system is required to serve as a “tie-breaker” in certain situations such as the loss of network connectivity between the two physical hosts. This third system is commonly called a “witness”. Virtual SAN utilizes a virtualized vSphere host – a virtual machine running ESXi – as the witness for a 2-host Virtual SAN cluster.

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

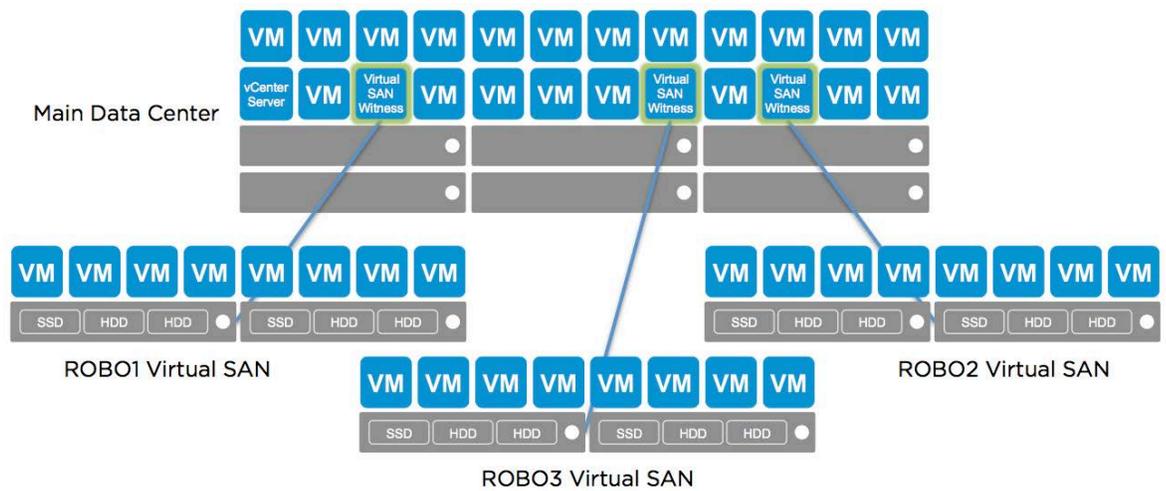


Figure 2: Virtual SAN ROBO Deployment

The Virtual SAN witness includes a license so there is no need to purchase Virtual SAN licenses for a Virtual SAN witness. The diagram below shows the selection of the Virtual SAN 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: Virtual SAN Witness License

The 2-host Virtual SAN deployment model is not restricted to a specific Virtual SAN license type. In other words, Virtual SAN Standard, Advanced, Enterprise, and ROBO licenses can be used for a 2-host Virtual SAN configuration. However, it is important to note that some features such as RAID-5/6 erasure coding require more than two physical hosts.

Stretched Cluster

The stretched cluster feature is available with the Enterprise edition of Virtual SAN 6.2. A Virtual SAN stretched cluster also utilizes a witness and consists of more than two physical Virtual SAN hosts distributed across two separate locations. The witness is commonly 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 Virtual SAN 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. Stretched clusters require Virtual SAN Enterprise licensing. The following illustration shows an 8-host stretched cluster.

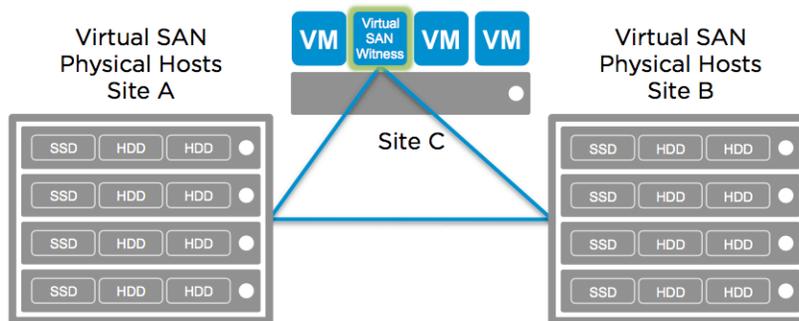


Figure 4: Virtual SAN Stretched Cluster

Examples

This section contains several example Virtual SAN implementation scenarios and Virtual SAN 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 configuration”. A cluster of hosts with flash devices in the capacity tier is referred to as an “all-flash configuration”.

Scenario 1: 4-host Virtual SAN cluster in a primary data center that is used to run server workloads.

This cluster requires eight Virtual SAN Standard if it is a hybrid configuration. If this cluster is an all-flash configuration, Virtual SAN Advanced licenses are required.

Scenario 2: 8-host Virtual SAN cluster running 100 virtual desktop workloads in a primary data center.

100 Virtual SAN for Desktop per-VM licenses would likely be the best choice although it is possible to license this cluster with per-CPU Standard or Advanced licenses. The virtual servers that support virtual desktops (e.g. Horizon View Connection Server) can also run on this cluster even if Virtual SAN for Desktop licenses are used.

Note: Virtual SAN Advanced licenses for virtual desktop workloads are included with Horizon Advanced and Enterprise licenses.

Scenario 3: 20-host all-flash Virtual SAN configuration running a combination of desktop workloads and server workloads other than the servers supporting virtual desktops in a primary data center.

40 Virtual SAN Advanced per-CPU licenses are required to properly license this cluster. Even though there are some virtual desktops running in this cluster, Virtual SAN for Desktop licensing cannot be used, as there are also server workloads present. If this was a hybrid configuration, Virtual SAN Standard per-CPU licenses could be used.

Scenario 4: 2-host Virtual SAN cluster running 10 virtual machines in a remote office.

A 2-host configuration requires a Virtual SAN witness. The witness would most likely run at a primary data center. There are less than 25 virtual machines running at this office, which means Virtual SAN for ROBO per-VM licenses can be used.

Scenario 5: Five remote offices each with a 2-host Virtual SAN 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 each contain two hosts and there are less than 25 virtual machines at each location. A total of 50 Virtual SAN for ROBO per-VM licenses are needed. This license edition is sold in packages of 25 and the licenses can be spread across remote offices. Two Virtual SAN for ROBO 25-packs are sufficient to cover the 50 virtual machines across the five remote offices.

Scenario 6: 3-host all-flash Virtual SAN cluster at a remote office running 30 virtual machines. Virtual SAN for ROBO licenses cannot be used in this scenario because the number of virtual machines is more than 25. Six Virtual SAN Advanced per-CPU licenses are needed.

Scenario 7: Three remote offices each with a 2-host Virtual SAN 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 Virtual SAN for ROBO licenses would cover the first and second remote offices. The third remote office would require four Virtual SAN Standard licenses as there are more than 25 virtual machines running at this location.

Scenario 8: 24-host all-flash Virtual SAN configuration in one location. The Quality of Service IOPS limiting feature is required to control the resource consumption of some virtual machines. 48 Virtual SAN Enterprise per-CPU licenses are needed since there is a requirement to use the IOPS limiting feature.

Scenario 9: 2-host all-flash Virtual SAN configuration at a remote office running 20 virtual machines.

Even though this is a remote site with only 20 virtual machines, Virtual SAN Advanced per-CPU licenses are required since this is an all-flash configuration. ROBO licenses do not include support for all-flash configurations.

Scenario 10: 12-host all-flash Virtual SAN 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 Virtual SAN 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 might be used help minimize downtime due to rack failure.

Scenario 11: 12-host Virtual SAN cluster with six hosts at a primary location and six hosts at a secondary location. A Virtual SAN witness is deployed to a third location to serve as a “tie-breaker.”

This scenario is a stretched cluster configuration requiring 24 Virtual SAN Enterprise per-CPU licenses.

Scenario 12: Three hosts configured with flash devices for cache and capacity – an all-flash Virtual SAN configuration. There are 20 server workloads running on this cluster.

Six Virtual SAN Advanced per-CPU licenses are needed even though there are only 20 virtual machines. Virtual SAN for ROBO does not include the all-flash feature.

Summary

- Virtual SAN works with any edition of vSphere
- Virtual SAN Standard, Advanced, and Enterprise licenses are per-CPU (socket) licenses. All hosts in the cluster must be licensed.
- All-flash Virtual SAN configurations require Advanced or Enterprise licenses.
- Stretched cluster configurations require Enterprise licenses.
- vSphere, vSphere with Operations Management, and vCloud Suite licensing does not include Virtual SAN.
- Virtual SAN for Desktop and Virtual SAN for ROBO are per-VM licenses.
- Virtual SAN for ROBO licenses can be spread across multiple remote offices.
- Only one Virtual SAN for ROBO 25-pack of licenses can be used at a remote office. Running more than 25 virtual machines at a remote office requires Standard, Advanced, or Enterprise licenses.
- Virtual SAN for Desktop licenses can only be used to run virtual desktop workloads.
- VMware Horizon Advanced and Enterprise licensing includes Virtual SAN Advanced licenses to run virtual desktops workloads only.
- A 2-host Virtual SAN cluster with the witness virtual machine can be deployed with any license edition.
- Any cluster with more than two physical hosts plus the witness virtual machine is considered a stretched cluster, which requires Enterprise licensing.
- Customers with Virtual SAN 6.1 Advanced licenses and current SnS are entitled to the Enterprise edition of Virtual SAN 6.2 when they upgrade.
- Virtual SAN 6.2 upgrade licenses are available for Standard to Advanced, Standard to Enterprise, and Advanced to Enterprise.