

VMware vSAN

Licensing Guide, Pricing and Packaging

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Introduction

HCI converges compute and storage resources on industry-standard x86 servers and uses software to abstract and pool cluster resources with unified management software. Hyperconverged infrastructure transforms data centers by simplifying operations through automation, lowering TCO by leveraging industry standard servers and scaling incrementally.

VMware's industry leading HCI software stack consists of vSphere for compute virtualization, vSAN, vSphere integrated storage, and vCenter for virtual infrastructure management. VMware HCI is configurable, and seamlessly integrates with VMware NSX™ to provide more secure network virtualization and/or vRealize Suite™ for advanced hybrid cloud management capabilities. HCI can be extended to the public cloud, as VMware powered HCI has integrated services with the six of the largest cloud providers, Amazon, Microsoft, Google Cloud, Alibaba, Oracle and IBM. Hundreds of public cloud providers also offer HCI-as-a-Service, including Rackspace, CenturyLink and OVH.

VMware vSAN enables customers to prime their business for growth through seamless evolution, leading flexibility and hybrid cloud capabilities. vSAN helps customers seamlessly evolve, as it is integrated to vSphere and requires no new tools. vSAN's industry leading ecosystem empowers customers to run HCI on certified solutions with their preferred vendor, and hybrid cloud capabilities provide customers consistent operations from edge to core to cloud, with intrinsic security throughout.

VMware provides the broadest choice of consumption options for HCI including VxRail™, a fully integrated HCI appliance from Dell EMC™ tailored for ease of deployment and over 500 pre-certified vSAN ReadyNodes™ from all major server vendors for complete flexibility in aligning with customer's vendor preferences and experiences. VMware also offers a fully managed infrastructure-as-a-service on-premises with VMware Cloud on Dell EMC; partners also offer infrastructure as-a-service, such as VMware Cloud Foundation on HPE Synergy with HPE GreenLake.

vSAN Licensing Overview

VMware vSAN can be licensed on a per-CPU, per-concurrent user in 10 or 100 license packs for virtual desktop infrastructure (VDI), and per-virtual machine in 25-VM license packs for remote office branch office (ROBO) implementations. Note that all editions can be licenses on these three metrics, except for vSAN Enterprise Plus, which is only available on a per-CPU license. More details can be found [here](#) on vSAN for VDI licensing and [here](#) on ROBO licensing.

In March 2020, VMware also announced an update to the per-CPU licensing model. While VMware will still be using a per-CPU approach, now, for any software offering that VMware license on a per-CPU basis, VMware will require one license for up to 32 physical cores. If a CPU has more than 32 cores, additional CPU licenses will be required. Please see this [FAQ](#) for more details.

Packaging Overview

vSAN license editions include Standard, Advanced, Enterprise, and Enterprise Plus. The following table shows the features included with each license edition.

Editions	Standard	Advanced	Enterprise	Enterprise Plus
vSAN 7 U2				
Storage Policy Based Mgmt.	✓	✓	✓	✓
Virtual Distributed Switch	✓	✓	✓	✓
Rack Awareness	✓	✓	✓	✓
Software Checksum	✓	✓	✓	✓
All-Flash Hardware	✓	✓	✓	✓
iSCSI Target Service	✓	✓	✓	✓
QoS - IOPS Limit	✓	✓	✓	✓
Cloud Native Storage (CNS) Control Plane	✓	✓	✓	✓
vSphere Container Storage Interface (CSI) Driver	✓	✓	✓	✓
Shared Witness	✓	✓	✓	✓
Deduplication & Compression		✓	✓	✓
RAID-5/6 Erasure Coding		✓	✓	✓
vRealize Operations within vCenter		✓	✓	✓
Data-at-Rest and Data-In-Transit			✓	✓
Stretched Cluster with Local Failure			✓	✓
File Services			✓	✓
HCI Mesh ¹			✓	✓
Data Persistence Platform for Modern Stateful Services			✓	✓
vRealize Operations 8 Advanced				✓

Table 1. License Editions and Product Features

¹ Cross Cluster Capacity Sharing

Notes:

- The deduplication & compression and RAID-5/6 erasure coding features require an all-flash vSAN configuration. These features are not supported with hybrid vSAN configurations.
- vSAN Standard, Advanced, Enterprise editions are licensed per-CPU (socket), per-VDI, or per-VM. Enterprise Plus edition is licensed per-CPU only. These four vSAN editions are available as standalone licenses and are not included with VMware vSphere®. Mixed workload—server and desktop—should be run on a vSAN cluster with per CPU vSAN licensing.
- 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.
- Customers can upgrade license keys in My VMware portal by following the instructions posted on VMware Knowledge Base article on [“How to upgrade license keys in My VMware”](#).
- Customers can downgrade license keys in My VMware portal by following the instructions posted on VMware Knowledge Base article on [“How to downgrade license keys in My VMware”](#).
- Complete list of features contained in vSAN version is located on [Storage Hub](#).

vSAN 7.0 U2 introduced notable feature enhancements to HCI Mesh and File Services:

HCI Mesh now allows vSAN clusters to share storage capacity with compute clusters, or non-HCI vSphere clusters. Customers can now adopt HCI without needing to replace existing servers, scale compute and storage independently and precisely to meet application needs, and optimize resource utilization across clusters, all while maintaining the operational simplicity of HCI.

To license an HCI Mesh deployment for just vSAN clusters or for vSAN clusters sharing storage capacity with compute clusters, vSAN Enterprise or Enterprise Plus licenses and any edition of vSphere licenses are required for the vSAN cluster. vSphere licenses are required on the vSAN cluster to maintain a unified HCI management control plane. Note that the compute clusters require vSphere licenses, but do not require vSAN licenses.

File Services now simplifies backup of file shares with an API that will allow backup and recovery software vendors to integrate with vSAN file services. This API will make the backup software aware of vSAN file shares, enabling them to track the new data created and only backup the incremental data created since the last backup. In addition, VMware has added scalability enhancements to files; customers can now enable file shares on 2-node vSAN deployments, making it a great option to replace low end NAS filers in ROBO settings.

vSAN 7.0 U1 introduced 4 new features and feature enhancement on File Services:

Data Persistence platform provides a framework for VMware partners that offer modern stateful services, such as object storage and NoSQL databases, to integrate with the underlying virtual infrastructure. The integration allows customers to run stateful services with high velocity scaling, simplified IT operations, and optimized TCO.

Developers can provision and scale services on demand with Kubernetes API.

Admins can rapidly deploy services and monitor the health and capacity of services from VMware vCenter®, while easily keeping the services up and running during infrastructure maintenance and upgrades.

Customers can deploy a stateful service alongside traditional applications on a regular vSAN cluster with vSAN-SNA (vSAN Support for Shared Nothing Architecture) policy, or deploy it on a dedicated vSAN cluster with vSAN Direct Configuration™, a technology enabling direct access to the underlying direct-attached hardware which can be optimized for the application needs. Both options benefit from optimal storage efficiency for modern stateful services by leveraging service-level replication, as well as unified management of services in vCenter.

Each partner must develop their own plug-in for VMware customers to receive the benefits of vSAN Data Persistence platform. The platform is not operational until the partner solution running on top is operational. vSphere Enterprise Plus, Tanzu Standard, and NSX-T Advanced or above are required to use the Data Persistence platform. Data Persistence platform is available in vSAN Enterprise and Enterprise Plus only.

HCI Mesh brings together multiple independent vSAN clusters for a native, cross-cluster architecture that disaggregates resources and enables utilization of stranded capacity. HCI Mesh is available with vSAN Enterprise and Enterprise Plus Editions.

Data-In-Transit Encryption delivers over the wire encryption for data between the vSAN Nodes using native encryption with vSAN and is simple to implement with no Key Management Server (KMS) required. Data-In-Transit Encryption is available in the Enterprise and Enterprise Plus editions.

Shared Witness enables multiple 2 Node vSAN deployments to share a common witness instance, with up to 64 clusters max per single shared witness host, reducing resources required for ROBO deployments. Shared witness is available in all vSAN editions.

File Services now supports the SMB protocols in addition to NFS protocols. vSAN File Services also adds critical capabilities that make it enterprise-ready, with Active Directory integration and Kerberos support. File Services is only available in the Enterprise and Enterprise Plus editions.

vSAN 7.0 introduced **File Services**. vSAN File Service is a layer that sits on top of vSAN to provide file shares. It currently supports NFSv3 and NFSv4.1 file share. vSAN File Service comprises of vSAN Distributed File System (vDFS) which provides the underlying scalable file system by aggregating vSAN objects, a Storage Services Platform which provides resilient file server end points and a control plane for deployment, management, and monitoring. File shares are integrated into the existing vSAN Storage Policy Based Management, and on a per-share basis. vSAN File Service brings in capability to host NFS file shares directly on the vSAN cluster.

vSAN 6.7 U3 release includes 2 major changes in vSAN licensing model. vSAN added a 4th edition **vSAN Enterprise Plus edition** which is a hard bundle of vSAN ENT and vROps Advanced features. This release also added **Cloud Native Storage (CNS) Control Plane and vSphere Container Storage (CSI) Driver** features which are included in all the vSAN editions.

vSAN 6.6 introduced vSAN **data-at-rest encryption**, which requires an external Key Management Server (referred as KMS) that provides the primary encryption key. This key is used to encrypt other keys in the cluster. While VMware does not provide a KMS solution, vSAN encryption is certified to work with enterprise grade key management servers. Please note, KMS vendors may have an additional licensing requirement. Different KMS vendors offer different license options, please check with the KMS vendor for further details. For a list of certified KMS vendors, refer to the [VMware compatibility guide](#).

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 utilizes vSAN Advanced edition can purchase an upgrade to the Enterprise edition to enable a stretched cluster architecture. Consult with your preferred reseller to get the current list of available upgrades and pricing.

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

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 license option 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 Advanced CCU licenses are now included in the following Horizon Bundles: Horizon Advanced Term, Horizon Enterprise Term, and Horizon Universal. Note that vSAN Advanced CCU licenses are not included in any of the Horizon perpetual bundles. More information on Horizon bundles can be found in this [Horizon Subscription Feature Comparison](#) and [Horizon Perpetual and Term Feature Comparison](#).

Remote Office / Branch Office

vSAN is 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 or Advanced, or Enterprise per CPU licensing must be used. Any number of hosts can be licensed with vSAN for ROBO Standard or Advanced or Enterprise 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 per CPU licenses without disruption when a remote office grows beyond 25 virtual machines. The definition of a remote office or branch office 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, Enterprise, and Enterprise Plus per-CPU licenses.

2-node Architecture

Another important item to discuss is the deployment of a 2-host architecture at the same location, which is supported and common in remote office implementations. A 2-host or “2-node” architecture consists of two physical vSphere hosts in a cluster in the same building running vSAN. More details on 2-node vSAN architecture can be found on [storage hub](#). The example below shows a main data center

and three remote offices. Each remote office has a 2-node vSAN cluster and a witness host for each cluster runs at the main data center.

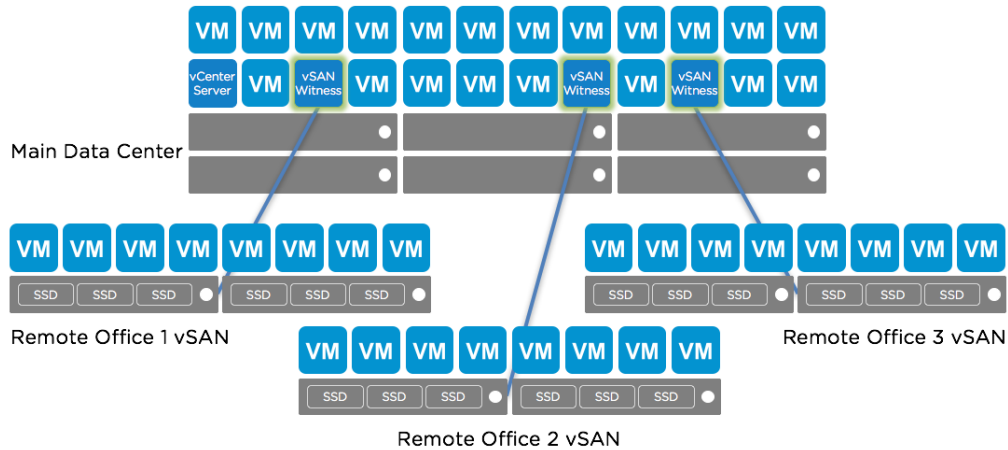


Figure 1. vSAN ROBO Deployment

The vSAN Witness Appliance is deployed from an OVA file and includes an embedded license. There is no need to purchase a vSphere license for the vSAN Witness Host when a vSAN Witness Appliance is used. If the vSAN Witness host is a physical machine, a vSphere license for this host is required. The diagram below shows the selection of the vSphere license for the witness host virtual appliance.

Licenses

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

Figure 2. vSAN Witness License

When Using vSphere Essentials Bundles

vSphere Essentials Kit or vSphere Essentials Plus Kit licensing limits the number of hosts managed by vCenter Server Essentials to three.

- When using a physical host as the vSAN Witness Host, it is considered a host by the Essentials licensing bundle.
- When using the vSAN Witness Appliance as the vSAN Witness Host, it is not considered a host by the Essentials licensing bundle.
 - This is because virtual machine workloads are not supported nor allowed to run on the vSAN Witness Appliance

Here is an example of a supported configuration:

- One physical host at the main data center managed by vCenter Server that is licensed with vCenter Server Essentials
- Two physical hosts at a remote office running a 2-node vSAN configuration managed by the same vCenter Server
- The vSAN Witness Appliance deployed at the main data center is used as a vSAN Witness Host for the 2-node vSAN configuration
- The vSAN Witness Appliance must be added to vCenter prior to the 3rd physical host being added to vCenter

- A warning message will be generated when attempting to add the vSAN Witness Appliance as a vSAN Witness Host after the 3 physical hosts have been added

Note: The order of operation is important – vCenter does not recognize the vSAN Witness Appliance as a virtual host until after it is added to vCenter

Stretched Cluster with Local Failure Protection

The Stretched Cluster feature with local failure protection is available with the Enterprise and Enterprise Plus editions of vSAN. More details on 2-node vSAN architecture can be found on [Storage Hub](#).

vSAN Stretched Cluster feature in vSAN Enterprise for ROBO **is allowed** for the below configurations:

- Stretched Cluster within a ROBO site may be used when no more than 25 total powered on VMs are running on the vSAN Stretched Cluster.
 - Stretched Cluster across 2 ROBO sites may be used when no more than 25 total powered on VMs are running across the 2 ROBO sites and ensure that in case of a site failure, the surviving ROBO site will have no more than 25 total powered on VMs.
- vSAN Stretched Cluster feature in vSAN Enterprise for ROBO **is not allowed** for the below configurations:
- Stretched Cluster configuration may not be stretched between a ROBO site and a site such as a primary data center. This scenario would require a traditional vSAN Enterprise license. Mixing ROBO and per CPU traditional licensing is not possible because:
 - a. A ROBO license may not be used in a site that is not categorized as ROBO. Stretching a vSAN Cluster using a ROBO license might lead to ROBO licensed VMs migrating to non-ROBO site which is not compliant
 - b. A vSAN cluster may not use mixed licensing because a single vSAN license is applied to each vSAN cluster. Stretching between Datacenter and ROBO site would require mixing per CPU licenses in the datacenter with per VM licenses in the ROBO site

Therefore, it is recommended that customers use traditional per-CPU vSAN Enterprise licensing for this scenario.

VMware HCI Kits

New licensing and packaging options were introduced with vSAN. VMware HCI Kit bundles simplify the purchase of vSphere and vSAN licenses. There are five data center kits with per-CPU licensing and two remote office branch office kits with per-VM licensing:

- VMware HCI Kit Essentials (per-6 CPUs) that includes vSphere Essentials plus and vSAN Standard
- VMware HCI Kit Standard (per-CPU) that includes vSphere Standard and vSAN Standard
- VMware HCI Kit Advanced (per-CPU) that includes vSphere Enterprise Plus and vSAN Advanced
- VMware HCI Kit Enterprise (per-CPU) that includes vSphere Enterprise Plus and vSAN Enterprise
- VMware HCI Kit with Operations Management (per-CPU) that includes vSphere Enterprise Plus and vSAN Enterprise Plus
- VMware HCI Kit ROBO Standard (per-25 VMs) that includes vSphere ROBO Enterprise and vSAN ROBO Standard
- VMware HCI Kit ROBO Advanced (per-25 VMs) that includes vSphere ROBO Enterprise and vSAN ROBO Advanced

Note: A maximum of one ROBO pack can be deployed per remote office site. A ROBO license pack can be split across sites—for example, five remote office sites with five virtual machines each would require only one ROBO license pack. HCI kit Essentials is the only HCI kit which comes with vCenter Essentials (vSphere Essentials Plus kit contains vCenter Essentials).

Licensing Scenarios

This section contains several example vSAN implementation scenarios and vSAN licensing for these scenarios. All scenarios utilize hosts that have two populated CPU sockets and CPUs with less than 32 physical cores unless otherwise noted.

Scenario 1: 16-host all-flash vSAN cluster for server workloads requiring data-at-rest encryption.

32 vSAN Enterprise licenses are needed. Data-at-rest encryption is a feature included only in the Enterprise edition of vSAN.

Scenario 2: 8-host all-flash vSAN cluster virtual desktops with 180 concurrent users.

vSAN for Desktop Advanced or Enterprise licenses (two CCU 100-packs) would likely be the best choice although it is possible to license this cluster with vSAN for Desktop Standard licenses. Standard license editions also support the use of all-flash hardware. However, Advanced and Enterprise licenses enable the use of deduplication, compression, and erasure coding. These vSAN space efficiency features typically provide a considerable reduction in the cost per usable gigabyte of capacity.

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.

Note: While it is possible to mix server and virtual desktop workloads in a vSAN cluster, VMware recommends a dedicated cluster for larger virtual desktop deployments.

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. vSAN for ROBO Enterprise licenses would enable data at rest encryption and stretched cluster with local failure protection features.

Scenario 5: 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 since this is an all-flash configuration. However, a minimum of four hosts are required for erasure coding.

Scenario 6: 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 7: 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 VMs 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 repurposed for another remote office location with 25 VMs or less.

Scenario 8: 12-host vSAN stretched cluster with six hosts at a primary location and six hosts at a secondary location. A vSAN witness host (virtual appliance) is deployed at a third location. This scenario requires 24 vSAN Enterprise per-CPU licenses. The witness virtual appliance includes a vSAN license.

Scenario 9: 1 host + 1 host+ witness (2-node cluster) across 3 rooms in the same building with maximum 25 VMs

This scenario requires either 1 vSAN STD for ROBO (per-VM 25-pack) or 4 vSAN STD per CPU licenses.

Scenario 10: 1 host + 1 host + witness (2-node cluster) across physical sites with maximum 25 VMs

This scenario requires either 1 vSAN STD for ROBO (per-VM 25-pack) or 4 vSAN STD per CPU licenses. Customer does not require ENT licenses for a 2-node cluster stretched across 2 physical site.

Scenario 11: 3 host + 3 host + witness (stretched cluster) across 3 rooms in the same building with maximum 25 VMs

This scenario requires either 1 vSAN ENT for ROBO (per-VM 25-pack) or 12 vSAN ENT per CPU licenses. Stretched cluster feature is only available in ENT edition of vSAN. Learn more about the vSAN Stretched Cluster feature in vSAN ENT for ROBO in the Stretched Cluster section of the guide.

Scenario 12: 3 host + 3 host + witness (stretched cluster) across physical sites with maximum 25 VMs

This scenario requires either 1 vSAN ENT for ROBO (per-VM 25-pack) or 12 vSAN ENT per CPU licenses. Stretched Cluster feature is only available in ENT edition of vSAN. Learn more about the vSAN Stretched Cluster feature in vSAN ENT for ROBO in the Stretched Cluster section of the guide.

Summary

- vSAN works with any edition of vSphere (Main editions, Acceleration Kit, Essentials Kits, Scale Out, ROBO, Desktop)
- vSAN Standard, Advanced, Enterprise, and Enterprise Plus 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, Enterprise, or Enterprise Plus licenses.
- Stretched cluster configurations and data-at-rest encryption require Enterprise and Enterprise Plus licenses.
- vSphere and vSphere with Operations Management 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.
- vSAN Advanced CCU licenses is no longer a part of Horizon Bundles after Horizon 8 release
- A 2-host vSAN cluster with a witness host can be deployed with any license edition.
- Any cluster with three or more physical hosts plus a witness host is a stretched cluster, which requires vSAN Enterprise or Enterprise Plus licensing.



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