VMWARE VSAN 6.7

Licensing Guide

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Introduction

VMware, the leader in Hyper-Converged Infrastructure (HCI), enables low-cost, high-performance HCI solutions powered by VMware vSAN™. The natively integrated software solution combines enterprise-class vSAN storage with the industry-standard VMware vSphere® hypervisor and VMware vCenter Server™, a unified management solution for today's modern data centers.

vSAN 6.7 delivers the industry's best storage value with native security, ease of management, high performance, and low cost. vSAN pools local storage devices to create a distributed shared datastore and provides a hyper-converged storage optimized for virtual machines. Customers of all industries and sizes trust vSAN to run their most mission critical applications such as Microsoft SQL Server, SAP, and Oracle Database. It is transformational technology that delivers unique value to VMware customers:

• Evolve without risk: As the only native-vSphere storage, vSAN enables you to seamlessly extend virtualization to storage, creating a hyper-converged solution that simply works with existing tools, skillsets, software solutions and hardware platforms. To help customers maintain infrastructure performance, VMware introduces vSAN ReadyCare support, highlighting VMware's commitment to supporting customers through investments in people, analytics and technology. vSAN continues to offer the broadest set of deployment choices supported by the vSAN ReadyNode™ ecosystem of leading server vendors such as Dell, HPE, and Cisco.

• Lower TCO: Faced with tight IT budgets, customers are turning to HCI powered by vSAN to lower total cost of ownership up to 50%. vSAN can dramatically reduce costs due to hardware choice, server-side economics, and affordable flash. Your operations become easier with fewer tasks and intelligent automation that can be managed through one tool and a unified team. The simplicity allows you to respond to business demands faster and more intelligently. New to the latest release, vSAN now further expedites time-to-value from a new, intuitive user interface which includes dozens of redesigned workflows. Also, global visibility enables you to take rapid action from intelligent insights delivered by vRealize Operations within vCenter.

• Scale to tomorrow: You can prepare for tomorrow's dynamic business in the multi-cloud era, with a solution designed to utilize the latest storage and server technologies, while supporting a wide range of applications, from current business critical applications, to next-generation applications using containers. Enjoy a common storage platform for your applications, whether running on-premises or off-premises, and use it as a stepping stone to the cloud. When combined with NSX, a vSAN powered SDDC stack can extend on-premises storage and management services across different public clouds, ensuring a consistent experience.

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 illustrate potential licensing scenarios.

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License Editions

vSAN license editions include Standard, Advanced, Enterprise, and Remote Office/Branch Office (ROBO) Standard, Advanced, and Enterprise. The following table shows the features included with each license edition.

	Standard	Advanced	Enterprise	Standard for ROBO	Advanced for ROBO	Enterprise for ROBO
Storage Policy Based Mgmt.	✓	✓	✓	✓	✓	✓
Virtual Distributed Switch	✓	✓	✓	✓	✓	✓
Rack Awareness	✓	✓	✓	✓	✓	✓
Software Checksum	✓	✓	✓	✓	✓	✓
All-Flash Hardware	✓	✓	✓	✓	✓	✓
iSCSI Target Service	✓	✓	✓	✓	✓	✓
QoS - IOPS Limit	✓	✓	✓	✓	✓	✓
Deduplication & Compression		✓	✓		✓	✓
RAID-5/6 Erasure Coding		✓	✓		✓	✓
vRealize Operations within vCenter		✓	✓		✓	✓
Data-at-Rest Encryption			✓			✓
Stretched Cluster with Local Failure Protection			✓			✓

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 configurations.

vSAN 6.7 comes with HTML5 User Interface which is completely redesigned to deliver a modern management experience. 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 vSAN stretched cluster configurations and data-at-rest encryption. vSAN for ROBO Advanced was introduced in vSAN 6.5 release and is only available in vSAN 6.5 or later versions. vSAN for ROBO Enterprise was introduced in vSAN 6.6.1. In vSAN 6.7 release, vRealize Operations within vCenter feature was made available to Advanced and Enterprise editions of vSAN.

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vSAN Standard, Advanced, and Enterprise editions are licensed per-CPU (socket). They are available as standalone licenses and are not included with VMware vSphere® or VMware vSphere with Operations Management™. 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.

vSAN data-at-rest encryption requires an external Key Management Server (referred as KMS), which 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.

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.

In addition to being available standalone, vSAN for Desktop Advanced licenses are also included with VMware Horizon Advanced and Enterprise editions.

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.

Horizon Advanced and Enterprise customers who wish to upgrade to vSAN Enterprise can do so via an add-on vSAN for Desktop Enterprise SKU.

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.

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 remotes 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 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 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, 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 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. 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 called a "witness host". vSAN commonly uses a virtualized vSphere host, a virtual appliance running ESXi, as the witness host for a 2-node vSAN cluster.

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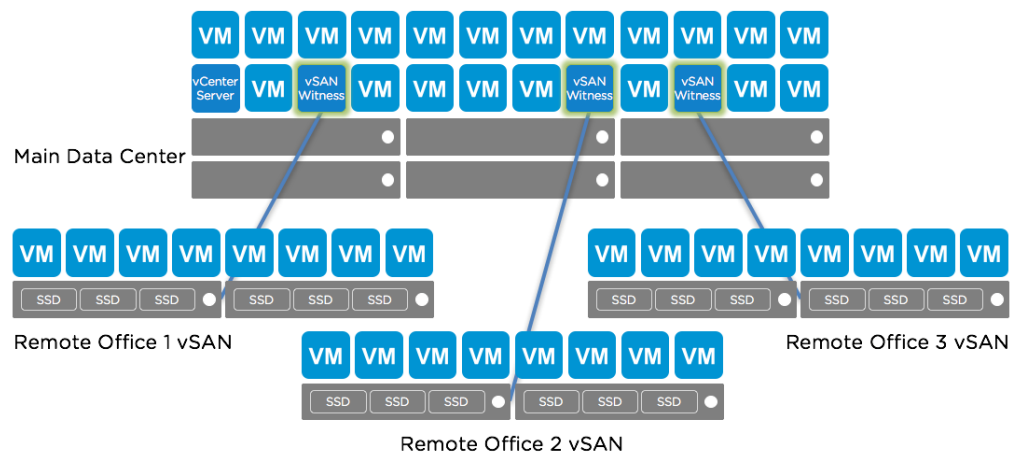
vSAN cluster and a witness host for each cluster runs at the main data center.

Figure 2: vSAN ROBO Deployment

The virtualized witness host is deployed from an OVA file and includes licensing. There is no need to purchase a license for the witness host virtual appliance. If the 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
⦿ ➔ License 1	NH2HM-XXXXX-XXXXX-XXXXX-28DNP	VMware vSphere 6 for Vi...	2 CPUs
○ 🖼 VSOM Ent Plus	4J2J6-	VMware vSphere with O...	0 CPUs

Figure 3: vSAN Witness License

The 2-node 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.

vSphere Essentials Kit or vSphere Essentials Plus Kit licensing limits the number of hosts managed by vCenter Server Essentials to three. The vSAN witness host—virtual appliance or physical—is considered a host in these Essentials licensing bundles.

Here is an example of where this would have an impact:

• 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 witness host virtual appliance deployed at the main data center

Even though there are only three physical hosts, a warning message is generated when attempting to add the witness host to the vCenter Server Essentials environment as this is considered four hosts—three physical hosts plus the witness host.

Stretched Cluster with Local Failure Protection

The stretched cluster feature with local failure protection is available with the Enterprise edition of vSAN. A vSAN stretched cluster is a configuration where three or more physical hosts are deployed with a witness host. The two locations that contain the physical servers for a stretched cluster are commonly called "data sites". The location where the witness is deployed is often referred to as the "witness site". The witness host serves as the "tie-breaker" when the network connection is disrupted between the two data sites. The witness site must be separate from the data sites.

The vSAN stretched cluster feature supports latencies up to 5ms round trip time (RTT) between the two data sites. Latencies up to 200ms RTT are supported between a data site and the witness site. The following illustration shows an example of an 8-host stretched cluster.
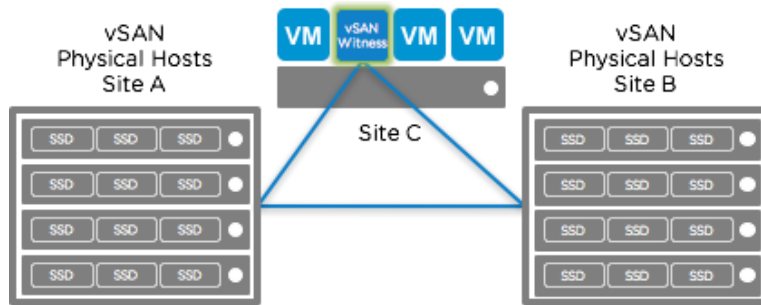
Figure 4: vSAN Stretched Cluster

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, three remote office branch office kits with per-VM licensing, and one HCI Acceleration Kit for distributed IT use cases:

• VMware HCI Kit Essentials (per-CPU) 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 with Operations Management Enterprise Plus and vSAN Enterprise

- VMware HCI Kit with Operations Management (per-CPU) that includes vSphere Enterprise Plus, vSAN Enterprise, and vROPs Advanced

- VMware HCI Kit ROBO Standard (per-VM) that includes vSphere ROBO Standard and vSAN ROBO Standard

- VMware HCI Kit ROBO Advanced (per-VM) that includes vSphere ROBO Advanced and vSAN ROBO Advanced

- VMware HCI Kit ROBO Enterprise (per-VM) that includes vSphere ROBO Advanced and vSAN ROBO Enterprise

- VMware Acceleration Kit (per-CPU) that includes vSphere Standard and vSAN Standard with a ~25% inherent discount on list price, limited to 3 single CPU nodes per cluster & 1 cluster per authorized location; includes no upgrades

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).

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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 needed, vSAN Advanced licenses are required.

Scenario 2: 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 3: 8-host all-flash vSAN cluster virtual desktops with 180 concurrent users.

vSAN for Desktop Advanced 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. Both license editions support the use of all-flash hardware. Advanced 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.

Note: vSAN for Desktop Advanced licenses are included with Horizon Advanced and Enterprise licenses. The virtual servers that support virtual desktops such as Horizon View Connection Server can also run on this cluster when vSAN for Desktop licenses are used. Horizon customers can upgrade from the bundled vSAN for Desktop Advanced licenses to vSAN for Desktop Enterprise licenses using an add-on SKU.

Scenario 4: 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 5: 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 6: 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 7: 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 8: Three remotes 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 9: 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 10: 24-host all-flash vSAN configuration in one location. The vSAN Encryption feature is required to provide a higher level of security.

48 vSAN Enterprise per-CPU licenses are needed since there is a requirement to use vSAN data-at-rest encryption.

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Scenario 11: 40-host all-flash vSAN cluster at a primary data center. A combination of 900 server and desktop workloads are running on this cluster. Deduplication, compression, and erasure coding are required to minimize capacity consumption. Encryption is not currently needed, but it might be a future requirement.

80 vSAN Advanced per-CPU licenses are required for this scenario. Deduplication, compression, and erasure coding require Advanced or Enterprise licensing. vSAN Encryption requires the Enterprise license edition. Advanced licenses can be upgraded to Enterprise, if needed in the future.

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 12: 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 13: 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 14: 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 15: 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 16: 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.

- 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 and data-at-rest encryption require Enterprise 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 or Enterprise 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 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 licensing.

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