

# VMware vSphere Storage Appliance Administration

vSphere Storage Appliance 1.0  
vSphere 5.0

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# VMware vSphere Storage Appliance Administration

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*VMware vSphere Storage Appliance Administration* provides information about monitoring, maintaining, and troubleshooting a vSphere® Storage Appliance cluster (VSA cluster).

## Intended Audience

This book is intended for anyone who is administering a VSA cluster. The information in this book is for experienced Windows system administrators who are new to virtual machine technology and datacenter operations and do not have the knowledge or experience in administering virtual and clustered environments

Read *vSphere Basics* documentation for introduction to virtualization, clusters, VMware vSphere® vMotion, VMware vSphere® High Availability, and so on.



# Updated Information

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This *vSphere Storage Appliance Administration* is updated with each release of the product or when necessary.

This table provides the update history of *vSphere Storage Appliance Administration*.

<b>Revision</b>	<b>Description</b>
000396-03	<a href="#">"VSA Cluster Capacity,"</a> on page 16 has been updated to include information about added RAID5 and RAID6 support.
000396-02	Minor revisions.
000396-01	Minor revisions.
000396-00	Initial release.



# Introduction to vSphere Storage Appliance

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# 1

VMware vSphere® Storage Appliance (VSA) is a VMware virtual appliance that packages SUSE Linux Enterprise Server 11 and storage clustering services. A VSA virtual machine runs on several ESXi hosts to abstract the storage resources that are installed on the hosts and to create a vSphere Storage Appliance cluster (VSA cluster).

This chapter includes the following topics:

- [“What Is a VSA Cluster?”](#) on page 9
- [“VSA Cluster Components,”](#) on page 10
- [“VSA Cluster Architecture,”](#) on page 11
- [“VSA Cluster Network Architecture,”](#) on page 12
- [“How a VSA Cluster Handles Failures,”](#) on page 14
- [“Differences Between VSA Clusters and Storage Area Networks,”](#) on page 15
- [“VSA Cluster Capacity,”](#) on page 16

## What Is a VSA Cluster?

A VSA cluster leverages the computing and storage resources of several ESXi hosts and provides a set of datastores that are accessible by all hosts within the datacenter.

An ESXi host that runs a vSphere Storage Appliance and participates in a VSA cluster is a VSA cluster member. With vSphere Storage Appliance 1.0, you can create a VSA cluster with two or three VSA cluster members. The status of the VSA cluster is online only when more than half of the members are online.

A VSA cluster enables the following features:

- Shared datastores for all hosts in the datacenter
- Replica of each shared datastore
- vSphere vMotion and vSphere HA
- Hardware and software failover capabilities
- Replacement of a failed VSA cluster member
- Recovery of an existing VSA cluster

## VSA Cluster Components

vSphere components together with the required hardware setup and configuration form a VSA cluster.

A VSA cluster requires the following vSphere and vSphere Storage Appliance components:

<b>ESXi 5.0 Hosts</b>	Two or three hosts with new installation of ESXi 5.0 can join a VSA cluster.
<b>vCenter Server 5.0</b>	A physical or virtual machine that runs vCenter Server 5.0 and manages all ESXi hosts that participate in the VSA cluster. If the machine is a virtual machine, it must not run on an ESXi host within the VSA cluster.
<b>vSphere Client 5.0</b>	An interface that enables users to connect remotely to vCenter Server or ESXi from any Windows computer and to manage the VSA cluster from the <b>VSA Manager</b> tab.
<b>vSphere Storage Appliance</b>	<p>A VMware virtual appliance that runs SUSE Linux Enterprise Server 11 SP1 and a set of storage clustering services that perform the following tasks:</p> <ul style="list-style-type: none"> <li>■ Manage the storage capacity, performance, and data redundancy for the hard disks that are installed on the ESXi hosts</li> <li>■ Expose the disks of a host over the network</li> <li>■ Manage hardware and software failures within the VSA cluster</li> <li>■ Manage the communication between all instances of vSphere Storage Appliance, and between each vSphere Storage Appliance and the VSA Manager</li> </ul> <p>Only one vSphere Storage Appliance can run on an ESXi host at a time.</p>
<b>VSA Manager</b>	<p>A vCenter Server 5.0 extension that you install on a vCenter Server machine. After you install it, you can see the <b>VSA Manager</b> tab in the vSphere Client. You can use VSA Manager to perform the following tasks:</p> <ul style="list-style-type: none"> <li>■ Deploy two or three vSphere Storage Appliance instances on two or three ESXi hosts to create a VSA cluster</li> <li>■ Mount as datastores the volumes that each vSphere Storage Appliance exports</li> <li>■ Monitor, maintain, and troubleshoot a VSA cluster</li> </ul>
<b>VSA Cluster Member</b>	An ESXi host that runs a vSphere Storage Appliance. It is a functional member of a VSA cluster that exposes a datastore and maintains a datastore replica.
<b>VSA Cluster Service</b>	A Windows service that is installed with VSA Manager on the vCenter Server computer. The service is installed by default for all configurations, but is used in a VSA cluster with two members to act as a third member in case one of the VSA cluster members fails. In such a case, the Online status of two out of three members maintains the Online status of the cluster. The service does not provide storage volumes for the VSA datastores.

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**IMPORTANT** VSA datastores continue operating with I/O, even if the VSA cluster service stops working. However, simultaneous failure of one of the VSA cluster members and of the VSA cluster service results in failure of the VSA datastores, and the status of the cluster changes to Offline.

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**VSA Cluster Leader**

A vSphere Storage Appliance that reports the status of the cluster to the VSA Manager. All members of the cluster participate in an election process through which they select the leader. The leader uses the cluster IP address to communicate with the VSA Manager.

**Gigabit Ethernet Switches**

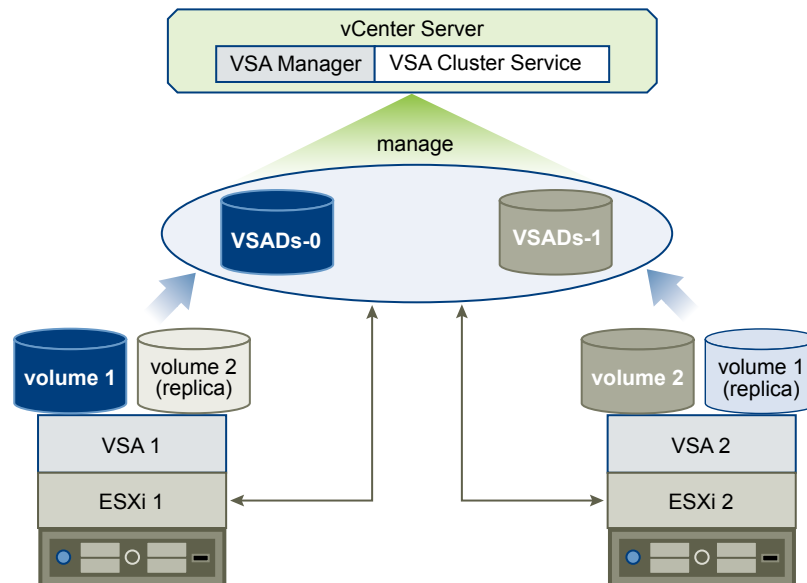
Gigabit Ethernet switches provide the high-speed network backbone of the VSA cluster.

## VSA Cluster Architecture

The architecture of a VSA cluster includes the physical servers that have local hard disks, ESXi as the operating system of the physical servers, and the vSphere Storage Appliance virtual machines that run clustering services to create volumes that are exported as the VSA datastores.

vSphere Storage Appliance supports the creation of a VSA cluster with two or three members. A vSphere Storage Appliance uses the hard disks of an ESXi host to create two volumes of the same size. It exports one of the volumes as a datastore. The other volume is a replica of the volume that is exported by another vSphere Storage Appliance from another host in the VSA cluster.

**Figure 1-1.** VSA Cluster with 2 ESXi Hosts

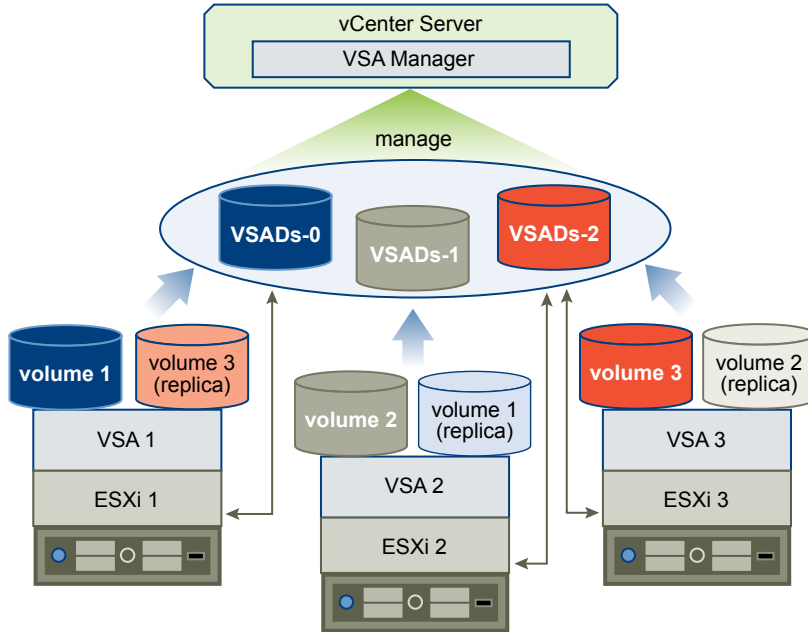


In a VSA cluster with two VSA cluster members, an additional service called VSA cluster service runs on the vCenter Server machine. The service participates as a member in the VSA cluster, but it does not provide storage. To remain online, a VSA cluster requires that more than half of the members are also online. If one instance of a vSphere Storage Appliance fails, the cluster can remain online only if the remaining VSA cluster member and the VSA cluster service are online.

A VSA cluster with 2 members has 2 VSA datastores and maintains a replica of each datastore.

A VSA cluster with 3 members has 3 VSA datastores and maintains a replica of each datastore. This configuration does not require the VSA cluster service running on the vCenter Server system.

**Figure 1-2.** VSA Cluster with 3 ESXi Hosts



## VSA Cluster Network Architecture

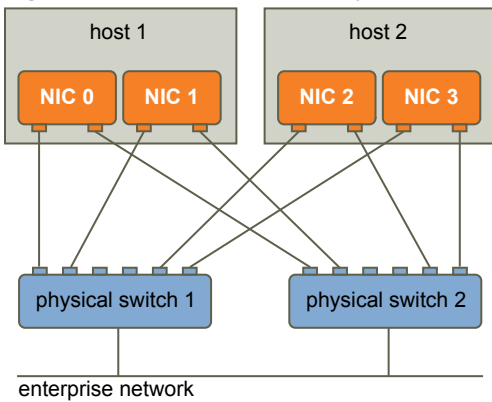
The physical network of a VSA cluster consists of Gigabit Ethernet switches and network interface cards (NICs) that are installed on each host.

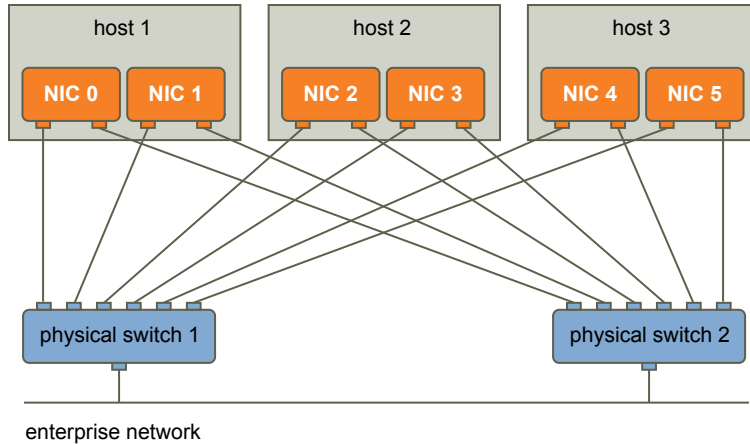
### Physical Network Architecture

All hosts in the VSA cluster must have two dual-port or four single-port network interface cards. You can use a single Gigabit Ethernet switch for the VSA cluster network. To ensure network redundancy, you should use two Gigabit Ethernet switches.

The following illustrations depict network redundancy in a VSA cluster with 2 and 3 members.

**Figure 1-3.** Network Redundancy in a VSA Cluster with 2 Members



**Figure 1-4.** Network Redundancy in a VSA Cluster with 3 Members

In a VSA cluster, the network traffic is divided into front-end and back-end traffic.

- Front-end network traffic
  - Communication between each VSA cluster member and the VSA Manager
  - Communication between ESXi and the VSA volumes
  - Communication between each VSA member cluster and the VSA cluster service
  - vMotion traffic between the hosts
- Back-end network traffic
  - Replication between a volume and its replica that resides on another host
  - Clustering communication between all VSA cluster members

## Logical Network Architecture

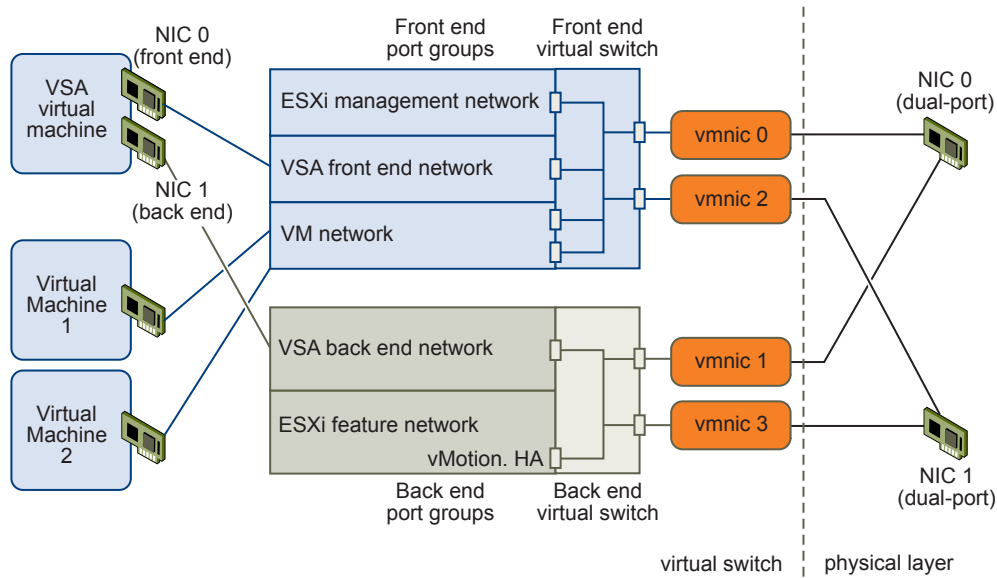
Each vSphere Storage Appliance has two virtual NICs: one handles the front-end traffic, and the other handles back-end traffic. The back-end virtual NIC has an IP address from a private subnet. The front-end virtual NIC can have up to 3 assigned IP addresses.

- IP address for VSA management network
- IP address of the exported NFS volume
- IP address of the VSA cluster (assigned only when the VSA cluster member is elected as the cluster leader)

The IP address of the VSA cluster can move between VSA cluster members. It is assigned to the front-end virtual NIC of a VSA cluster member only when that VSA cluster member is elected as the cluster leader. If the cluster leader becomes unavailable, the VSA cluster IP address is assigned to another VSA cluster member that becomes the leader.

The VSA cluster installation creates two vSphere standard switches on each ESXi host to isolate front-end and back-end traffic. The physical NICs act as an uplink for each vSphere standard switch so that each NIC handles either front-end or back-end traffic. The standard switches use ESXi NIC teaming to provide link failover.

The following illustration depicts the logical network of a VSA cluster member that is the leader in the VSA cluster. The logical network of other VSA cluster members is the same with the exception of the assigned VSA cluster IP address.

**Figure 1-5.** Logical Network Architecture of a VSA Cluster Member

## How a VSA Cluster Handles Failures

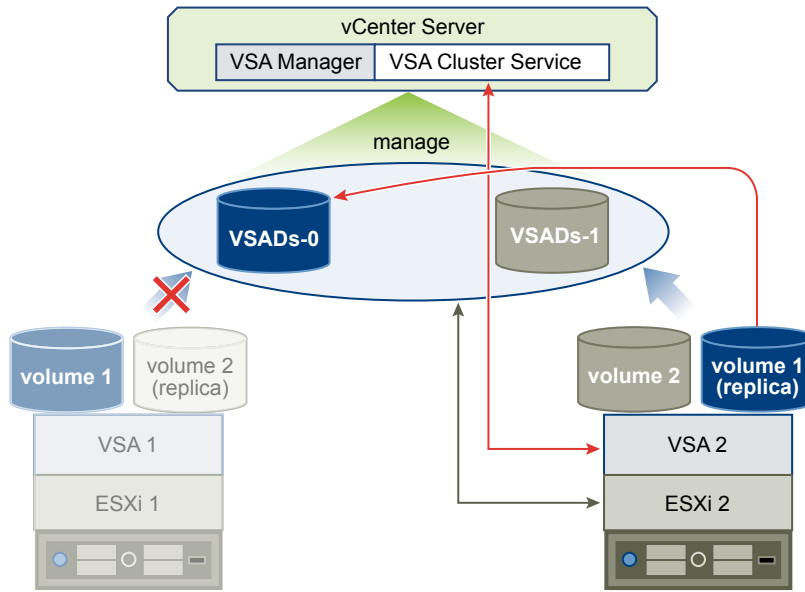
A VSA cluster provides automatic failover from hardware and software failures.

Each VSA datastore has two volumes. A VSA cluster member exports the main volume as the VSA datastore. Another VSA cluster member maintains the second volume as a replica. If a failure occurs to the hardware, network equipment, or the VSA cluster member of the main volume, the main volume becomes unavailable, and the replica volume takes its place without service interruption. After you fix the failure and bring the failed VSA cluster member back online, the member synchronizes the main volume with the replica to provide failover in case of further failures.

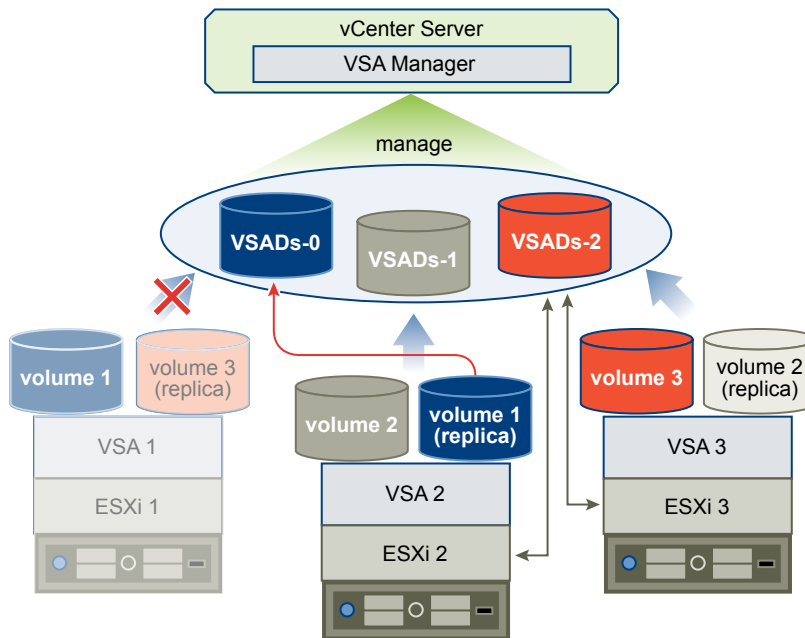
A VSA cluster provides automatic failover from the following failures:

- Single physical NIC failure
- Single physical switch failure
- Single physical host failure
- Single VSA cluster member failure

The following illustration depicts automatic failover in a VSA cluster with 2 members. The replica volume takes over the failed main volume. In this case, to make sure that more than half of the members are online, the VSA cluster service simulates a VSA cluster member.

**Figure 1-6.** Failover in a VSA Cluster with 2 Members

The following illustration depicts failover in a VSA cluster with 3 members.

**Figure 1-7.** Failover in a VSA Cluster with 3 Members

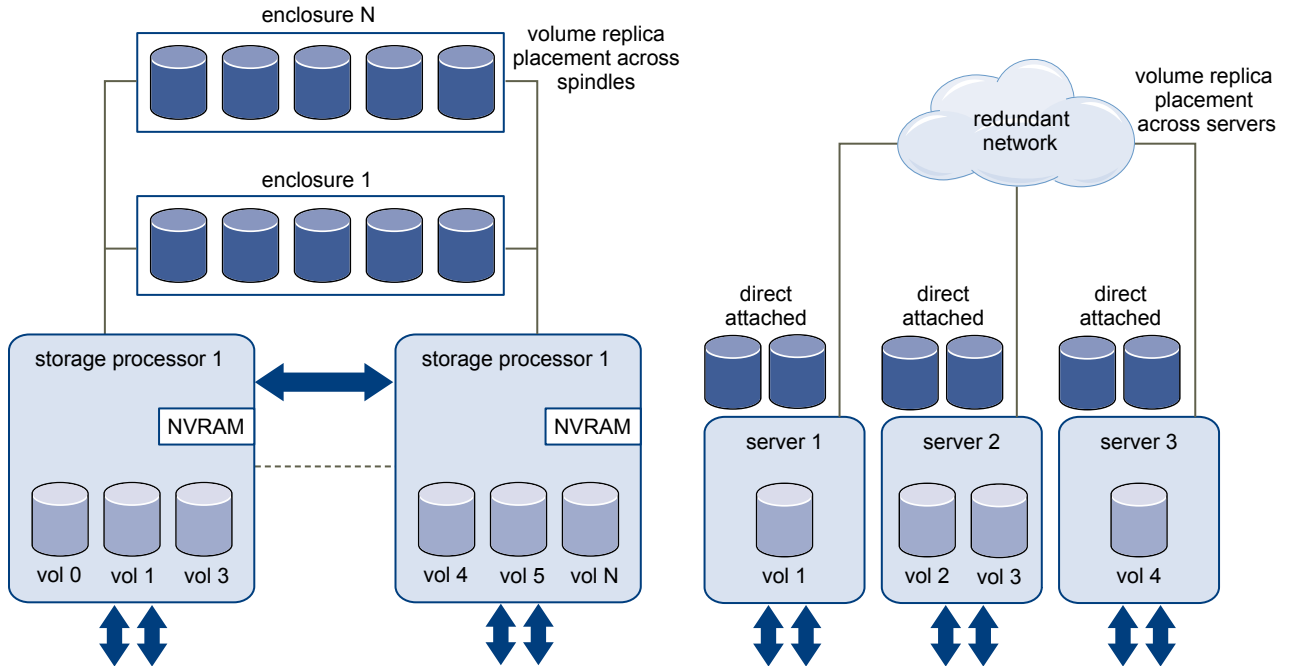
## Differences Between VSA Clusters and Storage Area Networks

A VSA cluster is a virtual alternative to expensive SAN systems. While SAN systems provide centralized arrays of storage over a high-speed network, a VSA cluster provides a distributed array that runs across several physical servers and utilizes local storage that is attached to each ESXi host.

### Centralized or Distributed Storage

SAN systems provide centralized arrays of storage that are managed by several storage processors. The vSphere Storage Appliance provides a distributed approach to storage, where the storage array is dispersed over several ESXi hosts and is accessible over the network.

**Figure 1-8. Centralized Storage Arrays in Comparison with Distributed Shared Storage**



## Local Storage or Networked Storage

Servers can access storage through local hard disks or through hard disks that are attached to NAS or SAN systems. A VSA cluster utilizes the hard disks that are local to each ESXi host.

### Local storage

Local storage consists of internal hard disks located inside your ESXi host.

### Networked storage

Networked storage consists of external storage systems that your ESXi host uses to store virtual machine files remotely. Typically, the host accesses these systems over a high-speed storage network.

## VSA Cluster Capacity

The total capacity of a VSA cluster is the sum of the capacities of all VSA datastores. Depending on the RAID configuration of your VSA cluster, you use different algorithms to calculate VSA capacity.

The VSA datastore capacity is calculated after ESXi installation takes hard disk space for root, swap, and dump partitions and after VSA installation reserves 20GB or more for local virtual machine swap files. Because of this, calculations of the VSA cluster capacity are approximate.

## Calculating Capacity of a VSA Cluster with RAID10 Configuration

This topic explains how to calculate the capacity of a VSA cluster with 4, 6, or 8 hard disks per ESXi host and a RAID10 configuration.

The capacity of the VSA cluster that uses this configuration depends on two variables.

- Total hard disk capacity per ESXi host
- Number of ESXi hosts in the VSA cluster (2 or 3)

The capacity of a VSA datastore equals the total hard disk capacity of the ESXi host divided by 4. This is due to the RAID10 configuration on each ESXi host and the mirroring of VSA volumes between VSA cluster members.

Determine the VSA datastore capacity by using the following formula.

VSA datastore capacity = hard disk capacity of an ESXi host / 4

Where

hard disk capacity of an ESXi host = the total capacity of the hard disks that are installed internally on the ESXi host

If you create a VSA cluster with hosts that have different total hard disk capacities, the lowest hard disk capacity from all ESXi hosts becomes the basis for calculating the capacity of every VSA datastore. In such a situation, some of the total hard disk capacity remains unused.

### **Example: Calculating the VSA Cluster Capacity in a Cluster with 3 ESXi Hosts with 8TB Hard Disk Capacity Per Host**

Hard disk capacity per ESXi host = 8TB

Total hard disk capacity of all ESXi hosts = 24TB

VSA datastore capacity = 8TB / 4 = 2TB

Total VSA cluster capacity = 2TB \* 3 hosts = 6TB

### **Example: Calculating the VSA Cluster Capacity in a Cluster with 3 ESXi Hosts with Different Capacities**

Hard disk capacity of ESXi host 1 = 6TB

Hard disk capacity of ESXi host 2 = 8TB

Hard disk capacity of ESXi host 3 = 8TB

Total hard disk capacity = 22TB

VSA datastore capacity = 6TB / 4 = 1.5TB

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**NOTE** The lowest hard disk capacity of all ESXi hosts becomes the basis for determining the capacity of all VSA datastore.

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Total VSA cluster capacity = 1.5TB \* 3 hosts = 4.5TB

In this example, the VSA cluster capacity is only 4.5TB

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**NOTE** Because this scenario underutilizes the hard disk space of the ESXi hosts that have more capacity, you should ensure that all ESXi hosts have the same hard disk capacity.

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## **Calculate Capacity of a VSA Cluster with RAID5 and RAID6**

This task explains how to calculate the capacity of a VSA cluster that uses hardware RAID5 or RAID6 configuration.

In this configuration, the capacity of the VSA cluster depends on the following variables:

- Number of hard disks in the hardware RAID set. The number of disks you can have in the RAID5 configuration is 4 to 8. In RAID6, the number of disks is 5 to 8. VMware recommends that you use RAID5 for SAS drives and RAID6 for SATA drives.
- Capacity of a hard disk in the hardware RAID set. For simplicity, assume that all hard disks are of equal capacity.
- Number of ESXi hosts in the VSA cluster (2 or 3).

**Procedure**

- 1 Calculate the storage capacity available on each ESXi host. The formula you use depends on your RAID configuration.

- For RAID5, use the following formula. The number of disks you can have in the RAID5 configuration is 4 to 8.

*total storage capacity per host = (number of hard disks in the RAID - 1) times hard disk capacity*

- For RAID6, use the following formula. The number of disks you can have in the RAID6 configuration is 5 to 8.

*total storage capacity per host = (number of hard disks in the RAID - 2) times hard disk capacity*

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**NOTE** If your hosts have different total storage capacities, the lowest value among all VSA cluster hosts becomes the basis for calculating the capacity of every VSA datastore. Some of the total storage capacity remains unused in this case.

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- 2 Calculate the capacity of a RAID5 or RAID6 VSA datastore by using the following formula:

*capacity of a VSA datastore = total storage capacity per host divided by 2*

The value that you get is a combination of the storage efficiency of the hardware RAID5 or RAID6 configuration on each of the ESXi hosts and the mirroring of VSA volumes between VSA cluster members.

- 3 Calculate total capacity of a VSA cluster by using the following formula:

*total VSA cluster capacity = capacity of a VSA datastore times number of hosts in the VSA cluster*

**Example: Calculating Capacity of a VSA Cluster with RAID5 or RAID 6 Configuration**

For the RAID5 example, the following parameters are used:

- Number of hard disks in the hardware RAID5 set: 8
- Capacity of each hard disk: 500GB
- Number of ESXi hosts in the VSA cluster: 3

$total\ storage\ capacity\ per\ host = (8-1) * 500GB = 3.5TB$

$capacity\ of\ a\ VSA\ datastore = 3.5TB/2 = 1.75TB$

$total\ VSA\ cluster\ capacity = 1.75TB * 3\ hosts = 5.25TB$

For the RAID6 example, the following parameters are used:

- Number of hard disks in the hardware RAID5 set: 8
- Capacity of each hard disk: 1TB
- Number of ESXi hosts in the VSA cluster: 3

$total\ storage\ capacity\ per\ host = (8-2) * 1TB = 6TB$

$capacity\ of\ a\ VSA\ datastore = 6TB/2 = 3TB$

$total\ VSA\ cluster\ capacity = 3TB * 3\ hosts = 9TB$

## Maintaining a VSA Cluster

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You can perform maintenance operations on the VSA cluster, such as placing the entire cluster or just a single VSA cluster member in maintenance mode, replacing a VSA cluster member that is offline, and changing the VSA cluster IP address. You should also ensure you prevent memory overcommitment in the VSA cluster.

This chapter includes the following topics:

- [“Memory Overcommitment Not Supported in a VSA Cluster,”](#) on page 19
- [“Perform Maintenance Tasks on the Entire VSA Cluster,”](#) on page 21
- [“Perform Maintenance Tasks on a VSA Cluster Member,”](#) on page 21
- [“Replace a VSA Cluster Member,”](#) on page 22
- [“Change the VSA Cluster Password,”](#) on page 22
- [“Reconfigure the VSA Cluster Network,”](#) on page 23

### Memory Overcommitment Not Supported in a VSA Cluster

A VSA cluster created with vSphere Storage Appliance 1.0 does not support memory overcommitment. VMX swapping is enabled by default and swapping to VSA datastores can make the cluster unstable, and as a result, virtual machines might begin powering off.

To prevent virtual machine downtime, do not overcommit memory in the VSA cluster. For each virtual machine in the VSA cluster, reserve the same amount of memory that is allocated to that virtual machine and disable the machine from swapping to the VSA datastores. Such a configuration ensures that all virtual machines running on an ESXi host in the VSA cluster do not use more memory than that available on the host, and do not attempt to perform VMX swapping.

For a VSA cluster that has HA enabled, the cluster reserves additional host memory to support the restart of virtual machines from a failed peer host. In a 2-member VSA cluster, HA reserves 50 percent of the reserved memory of each host for the restart of a failed-over virtual machine. Similarly, in a 3-member VSA cluster, HA reserves 33 percent of the reserved memory of each host for the restart of a failed-over virtual machine.

If you attempt to power on a virtual machine that exceeds the reserved memory threshold, the operation fails. Due to the memory threshold of an ESXi host, it is possible that not all virtual machines can be restarted on a running host in the event of a host failure.

## Set Memory Reservation on a Virtual Machine

To avoid memory overcommitment, you must reserve all of the memory allocated to each virtual machine that runs in the VSA cluster.

### Prerequisites

Power off the virtual machine before configuring the memory settings.

### Procedure

- 1 In the vSphere Client, right-click a virtual machine from the inventory and select **Edit Settings**.
- 2 In the Virtual Machine Properties window, select the **Resources** tab and select **Memory**.
- 3 In the Resource Allocation panel, select the **Reserve all guest memory (All locked)** check box.
- 4 Click **OK**.

The virtual machine's memory is now fully reserved as a measure to prevent memory overcommitment within the VSA cluster.

### What to do next

Repeat the same steps for all virtual machines that run in the VSA cluster.

## Disable VMX Swapping on a Virtual Machine

You can prevent virtual machines from VMX swapping to the VSA datastores by disabling VMX swapping on each virtual machine that runs in the VSA cluster.

### Prerequisites

Power off the virtual machine before you change its settings.

### Procedure

- 1 In the vSphere Client, right-click a virtual machine from the inventory.
- 2 Select the **Options** tab, and under **Advanced**, select **General**.
- 3 Click **Configuration Parameters**.  
The Configuration Parameters window appears.
- 4 Click **Add Row**.
- 5 Type the information required to disable the virtual machine from swapping to the VSA datastores and click **OK**.

Option	Action
<b>Name</b>	<code>sched.swap.vmxSwapEnabled</code>
<b>Value</b>	<code>false</code>

- 6 In the Virtual Machine Properties window, click **OK** to confirm the changes.

VMX swapping to the VSA datastore is disabled for the virtual machine.

### What to do next

Repeat the steps for all virtual machines in the VSA cluster.

## Perform Maintenance Tasks on the Entire VSA Cluster

You can put the VSA cluster in maintenance mode to perform maintenance tasks on any of its components (hosts, datastores, networking, and so on).

### Prerequisites

With the exception of the VSA virtual machines, shut down the operating systems and power off all virtual machines in the VSA cluster.

### Procedure

- 1 In the vSphere Client, select the datacenter that accommodates the VSA cluster and select the **VSA Manager** tab.
- 2 Click the **VSA Cluster Maintenance Mode** link in the upper-right corner of the tab.  
A confirmation dialog box appears.
- 3 Click **Yes** in the dialog box.  
The VSA cluster status is now Maintenance and the status of all datastores is now Offline.
- 4 Perform maintenance tasks on the hardware or on the software within the VSA cluster.
- 5 After you complete the maintenance, click **Exit VSA Cluster Maintenance Mode**.  
The status of the VSA cluster and the datastores changes to Online.

## Perform Maintenance Tasks on a VSA Cluster Member

You can put a VSA cluster member in maintenance mode and perform maintenance tasks on the host that accommodates the member.

You cannot put more than one VSA cluster member in maintenance mode.

### Prerequisites

Verify that all hosts in the cluster are running and that all datastores are available.

### Procedure

- 1 In the vSphere Client, select the datacenter that accommodates the VSA cluster and select the **VSA Manager** tab.
- 2 Select the **Appliances** view.
- 3 Right-click the VSA cluster member that you want to place in maintenance mode and select **Appliance Maintenance Mode**.
- 4 Click **Yes** in the confirmation dialog.

The interface reports that the status of the VSA cluster member that you selected is now Offline. The datastore that is exported by this VSA cluster member is now available through its replica that is exported by a VSA cluster member that runs on another host. The status of the datastore changes to Degraded, which means that the datastore is no longer highly available, because its replica is not Online.

### What to do next

You can perform maintenance operations on the hardware of the host that accommodates the VSA cluster member that is in maintenance mode. When you complete the maintenance operations, right-click the VSA cluster member again and select **Exit Appliance Maintenance Mode**.

## Replace a VSA Cluster Member

If an ESXi host that runs a VSA cluster member stops working, the VSA cluster status changes to Offline. You can use the Replace VSA Cluster Member wizard to replace the ESXi host with a replacement ESXi host that runs a new VSA cluster member.

The replacement ESXi host can be a newly installed ESXi host or the previously failed ESXi host after cleanup. The management IP of the previously failed ESXi host can be reused.

### Prerequisites

- Power off and remove the failed ESXi host.
- Add a replacement ESXi host to vCenter Server.

### Procedure

- 1 In the **VSA Manager** tab, click **Appliances**.
- 2 Right-click a VSA cluster member whose status is Offline and click **Replace Appliance**.  
The Replace Appliance wizard appears.
- 3 On the Select Appliance page, select the vSphere Storage Appliance whose status is Offline, and click **Next**.
- 4 On the Select Host page, select a newly installed ESXi host and click **Next**.  
VSA Manager verifies whether the available ESXi hosts meet the requirements to join a VSA cluster.
- 5 On the Format Disks page, select when to format the disks.

Option	Description
<b>Format disks on first access</b>	Disks are formatted after installation on first read or write.
<b>Format disks immediately</b>	Disks are formatted during the installation with zeroes. This requires additional time during the installation process.

- 6 On the Verify Configuration page, review the configuration of the replacement vSphere Storage Appliance, click **Install**, and click **Yes** in the confirmation dialog.  
Wait for the wizard to finish replacing the failed VSA cluster member.
- 7 After the wizard completes the task, click **Close**.

The wizard deploys a vSphere Storage Appliance on the new ESXi host and configures the appliance to join the VSA cluster and replace the failed VSA cluster member.

## Change the VSA Cluster Password

You can change the default VSA cluster password.

### Procedure

- 1 In the vSphere Client, select the datacenter that accommodates the VSA cluster and select the **VSA Manager** tab.
- 2 In the **VSA Manager** tab, click **Change Password** in the upper-right corner of the tab.

- 3 In the Change VSA Cluster Password dialog box, type the information required to change the VSA cluster password.

Option	Action
<b>Username</b>	Type <b>svaadmin</b> .
<b>Old Password</b>	Type the current VSA cluster password.
<b>New Password</b>	Type the new VSA cluster password.
<b>New Password Confirmation</b>	Retype the new VSA cluster password.

The default VSA cluster password is **svapass**.

- 4 Click **OK**.

The VSA cluster password is changed.

## Reconfigure the VSA Cluster Network

If the VSA cluster was installed in an environment different from your production environment, you can reconfigure the VSA cluster network..

### Procedure

- 1 [Put the VSA Cluster in Reconfigure Network Mode](#) on page 23  
You must put the VSA cluster in reconfigure network mode before you can reconfigure the network of the cluster.
- 2 [Reconfigure the Network Settings of the vCenter Server System](#) on page 24  
If you moved the vCenter Server to a different environment, you can reconfigure the network settings of the vCenter Server system.
- 3 [Reconfigure the Network Settings of the ESXi Hosts](#) on page 24  
If you moved the ESXi hosts to a different environment, you can reconfigure the network settings of the ESXi hosts.
- 4 [Remove Feature Port Groups From the ESXi Hosts](#) on page 25  
You must remove the feature port groups from the ESXi hosts before you can reconfigure the VSA cluster network.
- 5 [Reconnect the ESXi Hosts to vCenter Server](#) on page 25  
If you changed the IP addresses of the ESXi hosts and the vCenter Server system, you must reconnect the hosts to vCenter Server.
- 6 [Enable the VSA Manager Plug-In](#) on page 26  
You must enable the VSA Manager plug-in if the **VSA Manager** tab does not appear when you select a datacenter object.
- 7 [Reconfigure the VSA Cluster Network](#) on page 26  
After you reconfigure the network of vCenter Server and the ESXi hosts, you can run the Reconfigure VSA Cluster network wizard to complete the reconfiguration of the VSA cluster network.

## Put the VSA Cluster in Reconfigure Network Mode

You must put the VSA cluster in reconfigure network mode before you can reconfigure the network of the cluster.

### Prerequisites

The VSA cluster must be online and all VSA cluster member must be online.

**Procedure**

- 1 Shut down all non-VSA virtual machines that run in the VSA cluster.
- 2 Select the VSA datacenter object and click the **VSA Manager** tab.
- 3 In the VSA Manager tab, click **Enter Reconfigure Network Mode**.
- 4 In the confirmation dialog box, click **Yes**.  
The VSA cluster enters reconfigure network mode.
- 5 In the dialog box that appears after the operation is completed, click **Close**.
- 6 In the Reconfigure VSA Cluster Network wizard, click **Close**.
- 7 In the confirmation dialog box, click **Yes**.
- 8 Shut down the vCenter Server and ESXi host computers.

**What to do next**

After the VSA cluster is in reconfigure network mode, you can power off the vCenter Server system and the ESXi hosts and move them to a different production facility.

**Reconfigure the Network Settings of the vCenter Server System**

If you moved the vCenter Server to a different environment, you can reconfigure the network settings of the vCenter Server system.

**Procedure**

- 1 If you moved the vCenter Server system to a different environment, cable the system.
- 2 Power on the vCenter Server system.
- 3 From Control Panel, open the local area connection status and click **Properties**.
- 4 Select **Internet Protocol (TCP/IP)** in Windows Server 2003 or **Internet Protocol Version 4 (TCP/IP v4)** in Windows Server 2008 and click **Properties**.
- 5 Change the IP address, netmask, gateway, and DNS servers of the vCenter Server system.
- 6 Click **Advanced**.
- 7 In the IP addresses section, select the IP address of the VSA cluster service and click **Remove**.  
You remove the IP address of the VSA cluster service to ensure that a new IP address is assigned during network reconfiguration of the VSA cluster.
- 8 Click **OK** and **OK** to confirm the Advanced and TCP/IP protocol changes.
- 9 Open the Services utility and restart the **VMware VirtualCenter Server** and **VMware VirtualCenter Management Webservices** services.

**Reconfigure the Network Settings of the ESXi Hosts**

If you moved the ESXi hosts to a different environment, you can reconfigure the network settings of the ESXi hosts.

**Procedure**

- 1 Power on the ESXi hosts.
- 2 From your server management interface, open the remote console interface for each ESXi hosts.
- 3 After ESXi boots, press F2.

- 4 In the Authentication Required dialog, type the **root** account credentials for the ESXi host and press Enter.
- 5 Select **Configure Management Network** and press Enter.
- 6 In the Configure Management Network section, select **IP Configuration** and press Enter.
- 7 Select **Set static IP address and network configuration**, type the new IP address, subnet mask, and default gateway for the host, and press **Enter**.
- 8 In the Configure Management Network section, select **VLAN (optional)** and press Enter.
- 9 Type a new VLAN ID for the ESXi management network and press Enter.
- 10 In the Configure Management Network section, press Escape and select **Yes** in the confirmation dialog box to confirm the changed network settings.
- 11 Repeat the steps for each ESXi host.

## Remove Feature Port Groups From the ESXi Hosts

You must remove the feature port groups from the ESXi hosts before you can reconfigure the VSA cluster network.

### Procedure

- 1 Start the vSphere Client and connect to the new IP address of an ESXi host.
- 2 In the vSphere Client inventory, select the ESXi host and select the **Configuration** tab.
- 3 In the **Configuration** tab, click **Networking**.
- 4 Click **Properties** on the back-end virtual switch of the ESXi host.
- 5 In the **Ports** tab of the vSwitch Properties window, select **VSA-VMotion** and click **Remove**.
- 6 In the confirmation dialog box, click **Yes**.
- 7 In the port groups warning message, click **Yes**.
- 8 Click **Close** to close the vSwitch Properties window.
- 9 Repeat the steps for each ESXi host.

## Reconnect the ESXi Hosts to vCenter Server

If you changed the IP addresses of the ESXi hosts and the vCenter Server system, you must reconnect the hosts to vCenter Server.

You do not need to reconnect the ESXi hosts to vCenter Server if the IP address of the ESXi hosts or the vCenter Server system did not change.

### Prerequisites

The IP address of the ESXi hosts and vCenter Server must have changed after the VSA cluster was installed.

### Procedure

- 1 Connect to the new vCenter Server IP with the vSphere Client.  
vCenter Server fails to reconnect to old IP addresses of the ESXi hosts and shows an error message.
- 2 Close the error message.  
The Add Host wizard starts.
- 3 In the Connection Settings page, type the new ESXi host IP address and the **root** credentials for the host, and click **Next**.

- 4 In the Security Alert dialog box, click **Yes**.
- 5 Click **Yes** in the Duplicate Management warning message for the HA cluster.
- 6 On the Host Summary and Virtual Machine pages, click **Next**.
- 7 On the Ready to Complete page, click **Finish**.
- 8 Repeat the steps for each ESXi host.

After vCenter Server establishes connection with all ESXi hosts, it reconfigures the HA cluster settings.

## Enable the VSA Manager Plug-In

You must enable the VSA Manager plug-in if the **VSA Manager** tab does not appear when you select a datacenter object.

### Prerequisites

The VSA Manager tab does not appear when you select a datacenter object.

### Procedure

- 1 If the VSA Manager plug-in does not appear when you select the datacenter object, select **Plug-ins > Manage Plug-ins**.
- 2 In the Plug-In Manager window, right-click the **VSA Manager** plug-in and select **Enable**.

The **VSA Manager** tab appears.

## Reconfigure the VSA Cluster Network

After you reconfigure the network of vCenter Server and the ESXi hosts, you can run the Reconfigure VSA Cluster network wizard to complete the reconfiguration of the VSA cluster network.

The IP addresses for the VSA cluster, VSA cluster service, VSA management of each VSA virtual machine, and each NFS volume must be in the subnet of the vCenter Server IP address. For the feature IP address of the ESXi hosts, you can use IP addresses assigned by DHCP or in the subnet of the vCenter Server IP address. The back-end network IP address of each VSA virtual machine must be in the 192.168.x.x subnet.

### Prerequisites

Ensure that all non-VSA virtual machines that run on the ESXi hosts are shut down. You must not stop the VSA virtual machines, as the Reconfigure VSA Cluster Network wizard reconfigures and restarts them during the process.

### Procedure

- 1 In the **VSA Manager** tab, click **Reconfigure Network**.

The Reconfigure VSA Cluster Network wizard starts.

- 2 Reconfigure the VSA cluster network.
  - a In the **VSA Manager** tab, click **Reconfigure Network**.  
The Reconfigure VSA Cluster Network wizard starts.
  - b On the VSA Cluster Network page of the wizard, provide new IP addresses in the subnet of the vCenter Server IP address and click **Next**.

**Table 2-1.** VSA Cluster Network Configuration Values

Option	Action
VSA Cluster IP Address	Assign a static IP address for the VSA cluster. The VSA cluster IP address is assigned to the VSA cluster member that is the leader of the cluster. Do not use an IP address from the 192.168. private subnet.
VSA Cluster Service IP Address	Assign a static IP address for the VSA cluster service. The VSA cluster service runs on the vCenter Server system and is only used in a 2-member VSA cluster. Do not use an IP address from the 192.168.x.x private subnet.
<b>Network of ESXi Host 1</b>	
Management IP Address	Assign a static IP address for the management network of the VSA cluster member. Do not use an IP address from the 192.168. private subnet.
Datastore IP Address	Assign a static IP address for the NFS volume that is exported as a VSA datastore. Do not use an IP address from the 192.168. private subnet.
vSphere Feature IP Address	<ul style="list-style-type: none"> <li>■ Select the <b>Use DHCP</b> check box to assign an IP address to the ESXi feature network.</li> <li>■ Deselect the <b>Use DHCP</b> check box and assign a static IP address to the ESXi feature network.</li> </ul>
Subnet Mask	The subnet mask for the vCenter Server IP address. The wizard detects the subnet mask. You cannot change it.
Gateway	The gateway in the subnet of the vCenter Server IP address. The wizard detects the gateway IP address and you cannot change it.
VLAN ID	Assign a VLAN ID for the management network.
Back-end IP Address	Assign a static IP address to the back-end network of the VSA cluster member. <b>NOTE</b> You cannot assign a back-end static IP address that is in a subnet different from 192.168.x.x.
Back-end Subnet Mask	The subnet mask for the back-end network. The wizard adds this value for the back-end private subnet and you cannot change it.
Back-end VLAN ID	Assign a VLAN ID to the back-end network.
<b>Network of ESXi Host 2</b>	
Management IP Address	Assign a static IP address for the management network of the VSA cluster member. Do not use an IP address from the 192.168. private subnet.
Datastore IP Address	Assign a static IP address for the NFS volume that is exported as a VSA datastore. Do not use an IP address from the 192.168. private subnet.
vSphere Feature IP Address	<ul style="list-style-type: none"> <li>■ Select the <b>Use DHCP</b> check box to assign an IP address to the ESXi feature network.</li> <li>■ Deselect the <b>Use DHCP</b> check box and assign a static IP address to the ESXi feature network.</li> </ul>

**Table 2-1.** VSA Cluster Network Configuration Values (Continued)

Option	Action
Subnet Mask	The subnet mask for the vCenter Server IP address. The wizard detects the subnet mask. You cannot change it.
Gateway	The gateway in the subnet of the vCenter Server IP address. The wizard detects the gateway IP address and you cannot change it.
VLAN ID	Assign a VLAN ID for the management network.
Back-end IP Address	Assign a static IP address to the back-end network of the VSA cluster member. <b>NOTE</b> You cannot assign a back-end static IP address that is in a subnet different from 192.168.x.x.
Back-end Subnet Mask	The subnet mask for the back-end network. The wizard adds this value for the back-end private subnet and you cannot change it.
Back-end VLAN ID	Assign a VLAN ID to the back-end network.
<b>Network of ESXi Host 3</b>	
Management IP Address	Assign a static IP address for the management network of the VSA cluster member. Do not use an IP address from the 192.168. private subnet.
Datastore IP Address	Assign a static IP address for the NFS volume that is exported as a VSA datastore. Do not use an IP address from the 192.168. private subnet.
vSphere Feature IP Address	<ul style="list-style-type: none"> <li>■ Select the <b>Use DHCP</b> check box to assign an IP address to the ESXi feature network.</li> <li>■ Deselect the <b>Use DHCP</b> check box and assign a static IP address to the ESXi feature network.</li> </ul>
Subnet Mask	The subnet mask for the vCenter Server IP address. The wizard detects the subnet mask. You cannot change it.
Gateway	The gateway in the subnet of the vCenter Server IP address. The wizard detects the gateway IP address and you cannot change it.
VLAN ID	Assign a VLAN ID for the management network.
Back-end IP Address	Assign a static IP address to the back-end network of the VSA cluster member. <b>NOTE</b> You cannot assign a back-end static IP address that is in a subnet different from 192.168.x.x.
Back-end Subnet Mask	The subnet mask for the back-end network. The wizard adds this value for the back-end private subnet and you cannot change it.
Back-end VLAN ID	Assign a VLAN ID to the back-end network.

- c On the Verify Configuration page, review the new network configuration and click **Install**.

- d In the confirmation dialog box, click **Yes**.

The Reconfigure Network page of the wizard appears with the progress of the reconfiguration task. The Reconfigure VSA Cluster Network wizard powers off all VSA virtual machines and updates the virtual switch configuration of the ESXi hosts. After this step, the wizard powers on the VSA virtual machines and reconfigures their network interfaces. To assign the new IP addresses to the VSA datastores, the wizard unregisters all virtual machines from the inventory, unmounts the VSA datastores from the ESXi hosts, assigns new addresses to the datastores, mounts them back to each ESXi host, and then adds the virtual machines again to the inventory. When the wizard completes the task successfully, a message appears that says that the VSA cluster network is reconfigured. When the virtual machines are reregistered, the vSphere Client displays them with an information icon that indicates changes to their configuration.
  - e On the Reconfigure Network page, click **Close** to close the wizard.
- 3 Indicate that the reregistered virtual machines were moved.
    - a In the vSphere Client inventory, select a virtual machine with an information icon.
    - b Select the **Summary** tab on the right.

The **Summary** tab shows a virtual machine message that the virtual machine has been moved or copied.
    - c From the virtual machine message options, select **I moved it** and click **OK**.

The virtual machine icon changes to the default icon for powered-on virtual machine.
    - d Repeat the steps for all reregistered virtual machines in the VSA cluster.

The VSA cluster network is now reconfigured.



## Monitoring a VSA Cluster

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The **VSA Manager** tab provides information about the VSA cluster network, the VSA datastores, the VSA cluster members, and graphical representations of the connections between all components on the VSA cluster.

- [View Information About a VSA Cluster](#) on page 31  
You can view information about the name, status, network settings, and aggregated capacity of the VSA cluster.
- [View Information About a VSA Datastore](#) on page 32  
You can view information about a VSA datastore, such as capacity, network settings, exported volume and its replica.
- [View Information About a VSA Cluster Member](#) on page 33  
You can view the status, capacity, network, and replicas of a VSA cluster member from the **VSA Manager** tab.
- [View a Graphical Map of a VSA Cluster](#) on page 33  
You can view a graphical representation of the connection between the components of the VSA cluster.

### View Information About a VSA Cluster

You can view information about the name, status, network settings, and aggregated capacity of the VSA cluster.

#### Procedure

- ◆ In the **VSA Manager** tab, view information about the storage cluster in the Cluster Properties panel.
  - View the name and status of the cluster under VSA Cluster Status.
  - If your VSA cluster has two members, view the IP address and status of the VSA cluster service under VSA Cluster Status.
  - View the cluster management IP address under VSA Cluster Network.  
The VSA cluster IP address is assigned to the leader member of the cluster and is used to manage communication and tasks between all VSA cluster members.
  - View the capacity of the VSA cluster under Capacity.

Option	Description
Physical Capacity	View the total physical capacity of the hard disks that are installed on all ESXi hosts.
Storage Capacity	View the total capacity of the VSA datastores that you can use to store virtual machines and virtual disks.

## View Information About a VSA Datastore

You can view information about a VSA datastore, such as capacity, network settings, exported volume and its replica.

The number of VSA datastores matches the number of ESXi hosts that are in the VSA cluster.

### Procedure

- 1 In **VSA Manager** tab, select the **Datastores** view.

Information about shared datastores appears under the View area.

- 2 View information about all datastores in the table.

Column	Description
<b>Name</b>	View the name of the datastore.
<b>Status</b>	View the status of the datastore. <ul style="list-style-type: none"> <li>■ Online - the datastore and its replica are online.</li> <li>■ Offline - the datastore and its replica are offline.</li> <li>■ Degraded - the replica of the datastore is offline.</li> </ul>
<b>Capacity</b>	View the total capacity that each datastore has.
<b>Free</b>	View the available space on the datastore.
<b>Used</b>	View the space of the datastore that is currently in use.
<b>Exported By</b>	View the VSA virtual machine that manages the datastore.
<b>Datastore Address</b>	View the IP address of the datastore that vSphere Storage Appliance exposes. Each ESXi host uses this IP address to read and write data on the datastore.
<b>Datastore Netmask</b>	View the netmask of the subnet that the datastore uses.

- 3 Select a datastore and view information about its status, network, capacity, and replica in the Datastore Properties section.

- View the datastore status in the Datastore Properties section.
- View the datastore IP address in the Datastore Network section.
- View the free and used space of the datastore in the Capacity section.
- View the VSA virtual machines that manage the replica of the selected datastore in the bottom-left corner.

A shared datastore has a replica which is managed by an appliance running on another ESXi host. The hierarchy in the bottom-left corner shows which two virtual machines manage the datastore and its replica.

- 4 Browse the contents of a datastore.
  - a Select **View > Inventory > Datastores and Datastore Clusters**.
  - b Right-click a datastore and select **Browse Datastore**.

The Datastore Browser window shows the contents of the datastore.

- 5 Click **Close**.

## View Information About a VSA Cluster Member

You can view the status, capacity, network, and replicas of a VSA cluster member from the **VSA Manager** tab.

### Procedure

- 1 In the **VSA Manager** tab, click **Appliances**.

Information about VSA cluster members appears under the View area.

- 2 (Optional) View information about all VSA cluster members in the table.

Option	Description
<b>Name</b>	View the name of the selected VSA virtual machine.
<b>Status</b>	View the status of the selected VSA virtual machine. <ul style="list-style-type: none"> <li>■ Online - the VSA cluster member is online.</li> <li>■ Offline - the VSA cluster member is offline.</li> <li>■ Maintenance - the VSA cluster member is in maintenance mode.</li> </ul>
<b>Capacity</b>	View the total disk capacity on the host that runs the respective VSA cluster member.
<b>Mgmt Address</b>	View the management IP address of the VSA cluster member.
<b>Back End Address</b>	View the back-end network address for the selected VSA cluster member.
<b>Exported Datastores</b>	View the datastores that the selected VSA cluster member exports.
<b>Hosted Replica</b>	View the datastore replica that the VSA cluster member manages on its ESXi host.
<b>Host</b>	View the host on which the selected VSA cluster member resides.

- 3 (Optional) Select a VSA cluster member and view information about its properties.

VSA Virtual Machine Property	Action
<b>Name</b>	View the name of the selected VSA cluster member.
<b>Status</b>	View the status of the selected VSA cluster member. <ul style="list-style-type: none"> <li>■ Online</li> <li>■ Offline</li> </ul>
<b>Host</b>	View the ESXi host on which the VSA cluster member resides.
<b>Physical Capacity</b>	View the aggregated capacity of all physical hard disks on the host.
<b>Exported Datastores</b>	View the datastores that the selected VSA cluster member exports.
<b>Hosted Replica</b>	View the datastore replica that is managed by the selected VSA cluster member.

- 4 (Optional) View information about the VSA cluster member network configuration in the Management Network and Back End Network sections.

## View a Graphical Map of a VSA Cluster

You can view a graphical representation of the connection between the components of the VSA cluster.

### Procedure

- 1 In the **VSA Manager** tab, click **Map**.

A graphical map of the cluster appears.

- 2 View components or connections between components by selecting or deselecting the check boxes in the Map Relationships panel.

<b>Option</b>	<b>Description</b>
<b>Datastore to Replicas</b>	Shows the connection between a datastore and its exported volume and replica.
<b>Datastore to vSphere Storage Appliance</b>	Shows the connection between a datastore and the two VSA virtual machines that manage its exported volume and replica.
<b>Replica to vSphere Storage Appliance</b>	Shows the connection between a VSA virtual machine and the datastore volume that it manages.
<b>vSphere Storage Appliance to Host</b>	Shows the ESXi nodes and the VSA virtual machines that run on them.

# Troubleshooting a VSA Cluster

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During the installation and operation of an VSA cluster, different errors might occur which can prevent the correct functioning of the VSA cluster. You can take different actions to troubleshoot the errors.

This chapter includes the following topics:

- [“Collect VSA Cluster Logs,”](#) on page 35
- [“VSA Manager Tab Does Not Appear in vSphere Client,”](#) on page 36
- [“VSA Cluster Member Failure,”](#) on page 36
- [“Repair the Connection with the VSA Cluster Service,”](#) on page 37
- [“Restart the VSA Cluster Service,”](#) on page 37
- [“vCenter Server Failure,”](#) on page 37
- [“Recover an Existing VSA Cluster,”](#) on page 39

## Collect VSA Cluster Logs

While in operation mode, a failure might occur to the VSA cluster. You can view information about the failure by collecting the VSA cluster logs.

### Prerequisites

The VSA cluster must be installed and running to collect the logs from the **Download VSA Logs** button in the upper-right corner of the **VSA Manager** tab.

### Procedure

- 1 In the vSphere Client, select the **VSA Manager** tab.
- 2 In the **VSA Manager** tab, click **Export VSA Logs** in the upper-right corner.

The Export VSA Logs dialog shows a message that VSA Manager collects all logs from the running VSA cluster members, VSA Manager, and the VSA cluster service. After it completes the collection, the **Download VSA Logs** button appears.

- 3 Click **Download VSA Logs** and save the .zip log archive in a directory on the vCenter Server system.

## VSA Manager Tab Does Not Appear in vSphere Client

After the VSA Manager installation completes, the **VSA Manager** tab does not appear in vSphere Client.

### Problem

The **VSA Manager** tab does not appear in vSphere Client after the installation completes or between closing and re-opening the vSphere Client.

### Solution

- 1 Verify that Tomcat is running.
  - a Select **Start > Run**, enter **services.msc**, and press Enter.
  - b Select **VMware VirtualCenter Management Webservices** and view its status in the Status column.
  - c If the service is not running, right-click it and select **Start**.
  - d In Plug-in Manager of the vSphere Client, enable the **VSA Manager** plug-in.
- 2 Verify that the VSA Manager plug-in is enabled.
  - a In vSphere Client, select **Plug-ins > Manage Plug-ins**.  
The Plug-in Manager appears.
  - b Select **VSA Manager** and see its status in the Status column.
  - c If the status is Disabled, right-click **VSA Manager** and select **Enable**.  
The status of the VSA Manager plug-in changes to Enabled.
- 3 If you cannot enable **VSA Manager**, uninstall it from Add or Remove Programs and reinstall it again.

## VSA Cluster Member Failure

Due to various reasons a VSA cluster member might stop responding even though the ESXi host is still working as expected.

### Problem

A VSA cluster member stops responding or powers off, and its status changes to Offline in the **VSA Manager** tab.

### Cause

The following reasons might contribute to the Offline status of a VSA cluster members.

- Failure in the front-end network of the VSA virtual machine.
- Power failure in the ESXi host that accommodates the VSA virtual machine.

### Solution

- If a VSA cluster member is not responding, right-click it and select **Power > Reset**.  
The VSA cluster member reboots. Wait for its status to change to Online in the **VSA Manager** tab.
- If the VSA cluster member is powered-off, right-click it and select **Power > Start**.  
The VSA cluster member starts. Wait for its status to change to Online in the **VSA Manager** tab.
- If none of the steps above fix the issue, replace the VSA cluster member by using the Replace VSA Cluster Member wizard.

## Repair the Connection with the VSA Cluster Service

In a VSA cluster with two members the VSA cluster service might become unavailable. As a result, its status changes to Offline. You can use VSA Manager to repair the connection between the VSA cluster and VSA cluster service.

### Problem

In a VSA cluster with two members, the VSA cluster service might become unavailable.

### Cause

The cause of the problem might be that the service is not running on the vCenter Server machine.

### Solution

- 1 On the vCenter Server machine open the Services utility and verify that the **VMware VSA Cluster Service** is running.
- 2 In the **VSA Manager** tab, click **Repair VSA Cluster Service** in the upper-right corner.
- 3 Verify that the VSA cluster service status changes to Online.

The status of the VSA cluster service is shown on the left side of the Cluster Properties panel.

## Restart the VSA Cluster Service

If a failure occurs within a VSA cluster with two members, you might have to restart the VSA cluster service to ensure that the VSA cluster works as expected.

The VSA cluster service is used only if you created a VSA cluster with two members.

### Procedure

- 1 In the vCenter Server machine, select **Start > Run**, type **services.msc**, and click **OK**.
- 2 Right-click **VMware VSA Cluster Service** and select **Restart**.

The VSA cluster service starts.

### What to do next

In the **VSA Manager** tab, verify that the status of the VSA cluster service is now Online. If the status is Offline, click **Repair VSA Cluster Service** in the upper-right corner to re-establish the connection between the VSA cluster and the VSA cluster service.

## vCenter Server Failure

If your vCenter Server machine or vCenter Server installation fail permanently, the VSA cluster will continue working, but you cannot manage it from VSA Manager.

### Problem

If your vCenter Server machine fails, you cannot use VSA Manager to view information about the cluster or perform maintenance tasks.

### Cause

A hardware component might stop working or a permanent software failure might require that you reinstall your vCenter Server on another computer.

## Solution

- 1 Reinstall vCenter Server 5.0 on the same machine or on another machine.
- 2 Configure the new vCenter Server to use the same IP address and configuration settings as the machine that stopped working.
- 3 If you make frequent backups of the vCenter Server database, restore the most recent copy.
- 4 Install VSA Manager on the new vCenter Server machine.
- 5 Connect with vSphere Client to the reinstalled vCenter Server and select the **VSA Manager** tab.
- 6 On the Welcome page of the VSA Installer wizard, select **Recover VSA Cluster** and click **Next**.
- 7 On the VSA Cluster Information page of the VSA Installer wizard, type the required information to recover the existing VSA cluster.

Option	Action
<b>VSA Cluster IP Address</b>	Type the VSA cluster IP address. <b>NOTE</b> If you type a wrong IP address, VSA Manager cannot recover the VSA cluster and shows an error message.
<b>VSA Cluster User Name</b>	Type <b>svaadmin</b> .
<b>VSA Cluster Password</b>	Type the VSA cluster password. The default VSA cluster password is <b>svapass</b> .
<b>Host User Name</b>	Type <b>root</b> .
<b>Host Password</b>	Type the ESXi host password.

- 8 On the Verify Information page, review the information that you provided and click **Install**.
- 9 In the confirmation dialog box, click **Yes**.  
The Recovering VSA cluster page appears.
- 10 Verify the cluster data after the recovery completes.  
The Recover VSA Cluster workflow does not create an HA cluster and does not add the ESXi hosts to it. You can do this manually.
- 11 Create a VSA HA cluster and move the hosts to it.
  - a Right-click the datacenter where the VSA cluster is located and select **New Cluster**.  
The New Cluster Wizard opens.
  - b On the Cluster Features page, enter **VSA HA cluster** in the **Name** text box.
  - c Select the **Turn On vSphere HA** checkbox.
  - d Click **Next**.

- e On the vSphere HA page, configure the HA cluster options and click **Next**.

**Table 4-1.** VSA HA Cluster Options

Options	Action
Host Monitoring Status	The <b>Enable Host Monitoring</b> check-box is select by default. Do not change.
Admission Control	Select the <b>Enable: Disallow VM power on operations that violate availability constraints</b> check-box.
Admission Control Policy	Select the <b>Percentage of cluster resources reserved as failover spare capacity</b> check-box and type the recommended percent of reserved memory and CPU resources for your VSA cluster. For 2-member VSA cluster, type <b>50</b> percent. For a 3-member VSA cluster, type <b>33</b> percent.

- f On the Virtual Machine Options page, configure the behavior of the virtual machines within the HA cluster and click **Next**.

**Table 4-2.** Virtual Machine Options in the VSA HA Cluster

Virtual Machine Options	Action
VM restart priority	Select <b>Medium</b> from the drop-down menu.
Host Isolation response	Select <b>Leave powered on</b> from the drop-down menu.

- g On the VM Monitoring page, configure the options for monitoring virtual machines and click **Next**.

**Table 4-3.** Virtual Machine Monitoring Options in a VSA HA Cluster

Virtual Machine Monitoring Options	Action
VM Monitoring Status	Select <b>Disabled</b> from the <b>VM Monitoring</b> drop-down menu.
Default Cluster Settings	Move the <b>Monitoring sensitivity</b> slider to <b>High</b> .

- h On the VMware EVC page, enable EVC for the CPU family of the ESXi hosts and click **Next**.
- i On the VM Swapfile Location, select **Store the swapfile in the same directory as the virtual machine** and click **Next**.
- j On the Ready to Complete page, click **Finish**.
- 12 In the inventory, drag and drop the ESXi hosts on the VSA HA cluster object.

## Recover an Existing VSA Cluster

If the vCenter Server system failed and you had to recover or reinstall it together with VSA Manager, the VSA cluster is still running but is no longer registered with vCenter Server and VSA Manager. You can use the VSA Installer wizard to recover the running VSA cluster. Recovering the VSA cluster in VSA Manager does not make changes to the cluster.

### Prerequisites

Verify that the environment meets the VSA cluster recovery prerequisites.

- The IP addresses of the ESXi hosts did not change
- The VSA virtual machines are still running
- All ESXi hosts in the cluster have the same root password

- vCenter Server 5.0 is installed on the same or different computer
- The database of the failed vCenter Server is not restored

Install VSA Manager with the new vCenter Server 5.0 installation.

Create a new datacenter in vCenter Server. The datacenter name must not be **VSADC** as the VSA cluster recovery workflow creates a datacenter with that name. If a datacenter with the **VSADC** name exists, the recovery fails.

### Procedure

- 1 In the vSphere Client, select the new datacenter, and select the **VSA Manager** tab.
- 2 On the Welcome page of the VSA Installer wizard, select **Recover VSA Cluster** and click **Next**.
- 3 On the VSA Cluster Information page of the VSA Installer wizard, type the required information to recover the existing VSA cluster.

Option	Action
<b>VSA Cluster IP Address</b>	Type the VSA cluster IP address. <b>NOTE</b> If you type a wrong IP address, VSA Manager cannot recover the VSA cluster and shows an error message.
<b>VSA Cluster User Name</b>	Type <b>svadmin</b> .
<b>VSA Cluster Password</b>	Type the VSA cluster password. The default VSA cluster password is <b>svapass</b> .
<b>Host User Name</b>	Type <b>root</b> .
<b>Host Password</b>	Type the ESXi host password.

- 4 Click **Next**.
- 5 On the Verify Information page, review the information that you provided and click **Install**.
- 6 In the confirmation dialog box, click **Yes**.

The Recovering VSA cluster page appears.

The Recovering VSA cluster page shows the progress of the recovery task. After the recovery process is completed, the VSA Manager shows information about the existing VSA cluster.

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