

# HP StoreVirtual Storage VSA Installation and Configuration Guide

## Abstract

This guide provides information about installing and configuring the HP StoreVirtual VSA for vSphere and the HP StoreVirtual VSA for Hyper-V. Included are network configuration best practices to ensure the best performance for the SAN using the StoreVirtual VSAs. The intended audience is system administrators responsible for managing HP StoreVirtual Storage using StoreVirtual VSAs.



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### Acknowledgements

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# 1 Planning for the HP StoreVirtual VSA

HP StoreVirtual VSA software is a Virtual Storage Appliance that provides complete array functionality of HP StoreVirtual 4000 Storage for VMware vSphere or Microsoft Hyper-V environments without external array hardware. The HP StoreVirtual VSA uses scale-out, distributed clustering to provide a pool of storage with enterprise storage features and simple management. Multiple StoreVirtual VSAs running on multiple servers create a scalable pool of storage with the ability to make data highly available.

Beginning with Version 11.0, StoreVirtual VSAs are Adaptive Optimization-capable and can use multiple tiers of storage. Adaptive Optimization stores data which is accessed most frequently on the fastest performing media in a storage system—typically solid state drives. Adaptive Optimization in HP StoreVirtual automatically adapts to changing workloads and moves data accordingly and transparently. After Adaptive Optimization is enabled, the LeftHand OS stores the most accessed data to faster/higher tiers in the Adaptive Optimization-capable storage tier.

**Figure 1 Example of software-defined storage on HP ProLiant servers with the StoreVirtual VSA**



Careful planning of the virtual network configuration, the StoreVirtual VSA configuration, and the configuration of the HP StoreVirtual management groups, clusters and volumes for data storage ensures that you can take full advantage of the features and benefits of the HP StoreVirtual Storage.

## Planning the virtual network configuration

Before you install the StoreVirtual VSA on the network, plan the virtual network configuration, including the following areas:

- Design and configuration of the virtual switches and network adapters
- Host names and IP addresses for StoreVirtual VSAs
- Virtual network configuration, including the virtual IP address (VIP) of the StoreVirtual cluster for iSCSI access

## Designing your virtual storage pool

The design of your virtual storage pool affects both its performance and its reliability for production use. Use the concepts and practices in this manual when installing and managing your virtual storage pool to ensure optimal performance and reliability.

## Configuration requirements

The following configuration requirements are prerequisites for HP to support your virtual storage pool for production use.

- Available drive space of up to 32 GB for StoreVirtual VSA plus up to 50 TB of storage which should be virtualized. HP recommends installing vSphere Server or Hyper-V Server on top of a redundant RAID configuration. Do not use RAID 0.
- Sufficient number of CPUs reserved for the StoreVirtual VSA capacity, as listed in [Table 1 \(page 5\)](#). Ensure that you have additional memory and additional processors allocated for any other hosted VMs on the same system.

**Table 1 Number of CPUs required by VSA capacity**

Number of TB	Reserve CPUs
0 to 10	2
10 to 20	3
20 to 35	4
35 to 50	5

- Reserved memory based on total disk capacity, as listed in [Table 3 \(page 6\)](#).

- ① **IMPORTANT:** There are increased memory requirements for the StoreVirtual VSA in Version 11.x, as listed in [Table 3 \(page 6\)](#). Make sure that you increase the memory in existing StoreVirtual VSAs before performing an upgrade.

Upgrading existing StoreVirtual VSAs also requires that the disks are configured to be persistent. If the disks are not configured to be persistent, follow the instructions in [“Troubleshooting the StoreVirtual VSA for vSphere” \(page 16\)](#) to enable the persistent disk identifiers for each disk before upgrading.

Plan the capacity and duration you intend to configure on the StoreVirtual VSA. The StoreVirtual VSA requires a license for the capacity and the duration for use beyond the 60-day evaluation period. Licenses are available in the capacities and durations listed in [Table 2 \(page 5\)](#), two of which apply to tiered storage on the StoreVirtual VSA.

**Table 2 StoreVirtual VSA license capacity**

Maximum capacity	Duration	Maximum cluster size	Adaptive Optimization
1 TB	3 years To extend the promotionally licensed 1 TB VSA, you must upgrade the capacity as well as extend the duration.	3	No
4 TB	◦ 3 years ◦ 5 years	3	No
10 TB	◦ 3 years ◦ 5 years	Unlimited	Yes
50 TB	◦ 3 years ◦ 5 years	Unlimited	Yes

**Table 3 Memory requirements for StoreVirtual VSA disks**

Total virtualized capacity	Total memory requirement in GB	Total AO memory requirement in GB
<= 500 MB	4	4
500 MB – 4 TB	5	5
4 TB – 10 TB	7	8
10 TB – 20 TB	9	12
20 TB – 30 TB	12	17
30 TB – 40 TB	15	21
40 TB – 50 TB	18	26

- Virtual network environment with 1 GbE connectivity or higher, including the following:
  - A host name for the StoreVirtual VSA.
  - A network configuration plan, including reserved IP addresses, subnet mask, and gateway for the StoreVirtual VSA. If you use DHCP, be sure to reserve statically assigned IP addresses for all storage systems on the DHCP server. Reserved IP addresses are required.
- Dedicated RAID set for StoreVirtual VSA.
- If you plan to use tiered storage for Adaptive Optimization, plan the configuration of the datastore and physical disks in preparation for installing and configuring the tiered storage on the StoreVirtual VSA.

① **IMPORTANT:** In the StoreVirtual VSA, Tier 0 designates the fastest storage media. Tier 1 designates the next tier down in speed.

- The minimum configuration for high availability with automatic failover consists of two or more StoreVirtual VSAs on separate physical servers with Network RAID-10 and a Failover Manager. A manual failover configuration can be achieved with two or more StoreVirtual VSAs on separate physical servers and clustered with a Virtual Manager.

See [“Configuration requirements for the StoreVirtual VSA for vSphere” \(page 11\)](#) for configuration requirements specific to the StoreVirtual VSA for vSphere.

See [“Configuration requirements for the StoreVirtual VSA for Hyper-V” \(page 18\)](#) for configuration requirements specific to the StoreVirtual VSA for Hyper-V.

## Best practices for configuring the StoreVirtual VSA

Other configuration recommendations are useful to improve the reliability and performance of your virtual storage pool. Consider implementing as many of these best practices as possible in your virtual storage pool environment.

- Disable drive write caches on systems that are running the StoreVirtual VSA to prevent data loss in the event of a power failure.
- Each StoreVirtual VSA should meet the following conditions, if possible.
- Have a virtual switch or virtual network comprised of dual Gigabit Ethernet or more. Providing network redundancy and greater bandwidth improves both performance and reliability.
- Use redundant RAID for the underlying storage of a StoreVirtual VSA in each server to prevent single disk failures from causing StoreVirtual VSA system failure. Do not use RAID 0.

**NOTE:** See the *HP StoreVirtual Storage User Guide* for detailed information about using RAID for individual storage system data protection.

See [“Best practices for StoreVirtual VSA for vSphere” \(page 12\)](#) for best practices specific to the StoreVirtual VSA for vSphere.

See [“Best practices for StoreVirtual VSA for Hyper-V” \(page 19\)](#) for best practices specific to the StoreVirtual VSA for Hyper-V.

## Unsupported configurations for the StoreVirtual VSA

- The StoreVirtual VSA does not support bonding virtual network interfaces.

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**NOTE:** Only the StoreVirtual VSA for vSphere is configured with two network interfaces. The StoreVirtual VSA for Hyper-V is configured with one network interface.

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- The virtual NICs on the StoreVirtual VSA do not support flow control setting modifications or TCP off-load. The physical NICs on the host server can be configured with these features. (NIC bonding is a best practice in the host server.)
- The hot removal of virtual hard disks is not supported. See the *Microsoft Linux Integration Services User Guide*.

See [“Unsupported configurations for StoreVirtual VSA for vSphere” \(page 12\)](#) for unsupported configurations specific to the StoreVirtual VSA for vSphere.

See [“Unsupported configurations for StoreVirtual VSA for Hyper-V” \(page 19\)](#) for unsupported configurations specific to the StoreVirtual VSA for Hyper-V.

## Hardware and network design for the StoreVirtual VSA

The hardware platform and network design used for a virtual storage pool affect the capacity, performance, and reliability of that virtual storage pool. Some hardware platform requirements are described in [“Configuration requirements” \(page 5\)](#). Other considerations for planning a StoreVirtual VSA implementation are described below.

- Virtual switch or network
- Controllers and hard disk drives
- Network adapters

### Virtual switch or network

The virtual switch or network should be dedicated to the StoreVirtual VSA and iSCSI initiators that are accessing the StoreVirtual cluster.

The virtual switch or virtual network that is used for StoreVirtual VSA should be at least a redundant Gigabit network, if possible. Performance and reliability can be improved even further by using more than two ethernet adapters in the iSCSI and StoreVirtual VSA virtual networks or by using 10 GbE network adapters.

### Controllers and drives

The internal disk controller and disk drives of a platform affect the capacity and I/O performance of the StoreVirtual VSA. Ideally, StoreVirtual VSAs should use storage that is hosted by many drives. If you are designing a new server that will host StoreVirtual VSAs, you should incorporate the following recommendations.

- When using hard drives, use as many drives as the platform will allow and that have faster rotation speeds. The more hard drives and the faster their rotation speed, the more IOPs, and better performance.
- If using Adaptive Optimization, use SSD drives for ten percent of the storage capacity.
- Select controllers with protected write cache and ensure that the write cache is enabled.

- Do not enable disk caching on servers that host VSAs.
- Every virtual disk should be RAID-protected and not configured with RAID 0.

## Network adapters

The number of network adapters available in a platform affects your options for configuring virtual switches. StoreVirtual VSAs that will have a dedicated server platform only need two ethernet (minimum 1 GbE) network adapters. Platforms that will host StoreVirtual VSAs and other virtual machines should have at least four ethernet (minimum 1 GbE) network adapters so that two adapters can be dedicated to the StoreVirtual VSA and iSCSI traffic.

## Using StoreVirtual VSAs and HP StoreVirtual 4000 Storage

StoreVirtual VSAs and physical storage systems can be mixed in management groups. When mixing virtual and physical storage systems, and mixing differently configured StoreVirtual VSAs, consider the following requirements and guidelines.

- **Running managers on physical platforms**

When possible, locate all managers in a management group on physical platforms instead of StoreVirtual VSAs, and ideally on the fastest platforms in the management group. While StoreVirtual VSAs can run managers, physical platforms provide better performance and a lower likelihood that they will be rebooted for administration reasons.

- **Installing StoreVirtual VSAs that are running managers on separate physical platforms**

If StoreVirtual VSAs are running managers, ensure that those StoreVirtual VSAs reside on separate physical platforms. Otherwise, rebooting a single physical platform could cause a loss of quorum in the management group.

- **Managing the performance impact of mixing platforms in clusters**

Mixing StoreVirtual VSAs built from different hardware in the same cluster also yields unpredictable performance. Typically, the overall performance of the cluster is close to the aggregate average of the storage systems in the cluster.

Additionally, you may perceive performance degradation if a faster StoreVirtual VSA fails, thereby causing volumes to fail over to a slower StoreVirtual VSA. Such performance degradation is normal in a mixed cluster.

- **Managing the storage capacity of mixing platforms in clusters**

While clusters can contain storage systems with different capacities, all storage systems in a cluster operate at a capacity equal to that of the smallest-capacity storage system. The additional capacity on the StoreVirtual VSA will operate according the same rules for physical storage systems in a cluster; that is, the StoreVirtual VSA will operate at a capacity equal to that of the smallest capacity StoreVirtual VSA in the cluster. See “Clusters and storage systems” in the *HP StoreVirtual Storage User Guide* for more information.

## Sample configurations

The sample configurations illustrate some of the recommended best practices for redundancy and availability.



## Two-storage system configuration

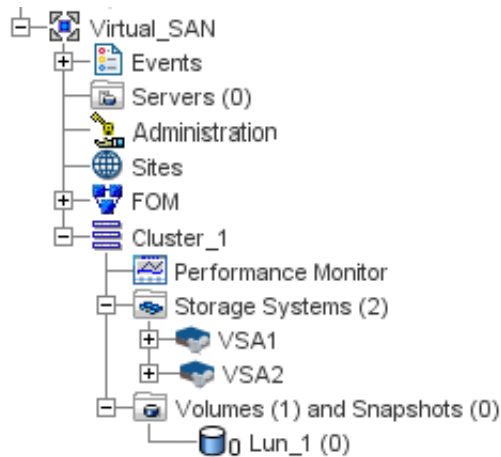
A two-system configuration is the smallest possible redundant configuration. Automatic failover between storage systems requires a Failover Manager. A two-storage system configuration contains the following elements.

- Two StoreVirtual VSAs in a single management group
- A single cluster
- Two managers
- A Failover Manager added to the management group

**NOTE:** For more information, see “Failover Manager Overview” in the *HP StoreVirtual Storage User Guide*, available on the following website:

<http://www.hp.com/support/StoreVirtualManuals>

**Figure 2 Two-storage system configuration**

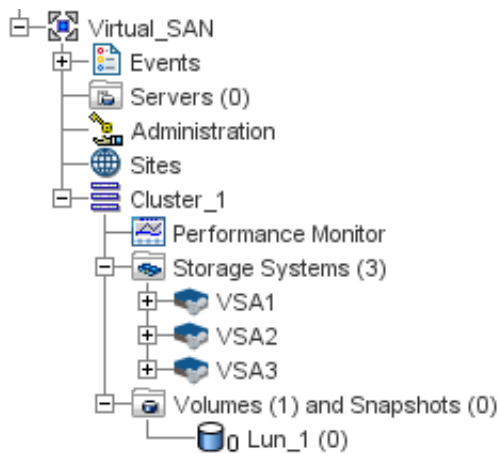


## Three-storage system-plus configuration

All configurations greater than two storage systems can be redundant, and do not require a Virtual Manager or Failover Manager. A configuration greater than two storage systems contains the following elements.

- Three or more storage systems in a management group
- Multiple clusters with as many StoreVirtual VSAs as desired in each cluster
- Running three or five managers, as appropriate

**Figure 3 Three-storage system-plus configuration**



## Technical videos

Videos are available that illustrate installing the StoreVirtual VSA.

- Overview of the StoreVirtual VSA Install & Config Series  
<http://h20621.www2.hp.com/video-gallery/us/en/products/storage/3653680714001/hp-storevirtual-vsa-installation-configuration-1-series-overview/video/>
- StoreVirtual VSA Technology Brief, Licensing and Downloading the Software  
<http://h20621.www2.hp.com/video-gallery/us/en/products/storage/3653680718001/hp-storevirtual-vsa-installation-configuration-2-technology-brief-licensing-and-download/video/>
- Installing StoreVirtual VSA for VMware  
<http://h20621.www2.hp.com/video-gallery/us/en/products/storage/3653680719001/hp-storevirtual-vsa-installation-configuration-3-installing-vsa-for-vmware/video/>
- Activating the StoreVirtual VSA 1TB License for VMware & Hyper-V  
<http://h20621.www2.hp.com/video-gallery/us/en/products/storage/3653680716001/hp-storevirtual-vsa-installation-configuration-5-configuring-vsa-for-vmware/video/>
- Configuring StoreVirtual VSA for VMware  
<http://h20621.www2.hp.com/video-gallery/us/en/products/storage/3653680716001/hp-storevirtual-vsa-installation-configuration-5-configuring-vsa-for-vmware/video/>
- Adaptive Optimization Overview and VMware Deployment  
<http://h20621.www2.hp.com/video-gallery/us/en/products/storage/3653680715001/hp-storevirtual-vsa-installation-configuration-6-adaptive-optimization-overview/video/>

## 2 Installing the HP StoreVirtual VSA for vSphere

The HP StoreVirtual VSA for vSphere is pre-formatted for use with VMware vSphere. If you are using an evaluation copy, and want to continue using the fully-featured StoreVirtual VSA after the trial period has ended, you must purchase a license key. After you apply the license key, your configuration can be used as is in a production environment, or reconfigured if necessary.

### Supported versions of VMware

VMware vSphere 5 for LeftHand OS 9.5 or later.

### Configuration requirements for the StoreVirtual VSA for vSphere

- A qualified server for VMware. For a list of qualified servers, see the VMware compatibility guide, located at:  
<http://www.vmware.com/resources/compatibility/search.php>.
- Virtual disk(s) with up to 2 TB (2047 GB for vSphere 5.0 and vSphere 5.1) or up to 64 TB (for vSphere 5.5) of space per disk located on internal disk storage, or any block storage that is on the VMware HCL: internal, external and shared. (Note that the LeftHand OS software consumes a small amount of the available space.)
- StoreVirtual VSA for vSphere virtual disks must be configured as independent and persistent to prevent VM snapshots from affecting them.
- The VMFS datastores for the StoreVirtual VSA must not be shared with any other VMs.
- Microsoft .Net 3.5 on the installer client.
- vCenter servers properly licensed before connecting to them using the HP StoreVirtual VSA for vSphere installer.
- When installing VSAs that use more than 8 TB of datastores, increase the VMFS heap size. According to VMware, the VMFS heap size must be increased to access more than 8 TB of VMDKs in a VM. This means that a StoreVirtual VSA that uses more than 8 TB of datastores should have the heap size increased. See the following article for more information:  
<http://kb.vmware.com/kb/1004424>

The default heap size has been increased in vSphere 5.x to 80 MB, which allows for 8 TB of open virtual disk capacity on a single vSphere host.

**NOTE:** In vSphere 5.x the maximum heap size is 256 MB. This allows for a maximum of 25 TB of open storage.

Table 4 (page 11) outlines the minimum and maximum heap sizes that can be set for the various builds of vSphere:

**Table 4 Minimum and maximum heap sizes**

Version/build	Minimum heap value	Maximum heap value	Maximum open VMDK storage per host
ESXi/ESX 4.x	N/A	128 MB	32 TB
ESXi 5.0 Build 914586 and earlier	N/A	256 MB	25 TB
ESXi 5.0 Build 1024429 and later	256 MB	640 MB	60 TB

**Table 4 Minimum and maximum heap sizes** *(continued)*

Version/build	Minimum heap value	Maximum heap value	Maximum open VMDK storage per host
ESXi 5.1 Build 914609 and earlier	N/A	256 MB	25 TB
ESXi 5.1 Build 1065491 and later	256 MB	640 MB	60 TB

## Best practices for StoreVirtual VSA for vSphere

- Configure the StoreVirtual VSA for vSphere to start automatically and first, and before any other virtual machines, when the vSphere Server on which it resides is started. This ensures that the StoreVirtual VSA for vSphere is brought back online as soon as possible to automatically re-join its cluster.
- Locate the StoreVirtual VSA for vSphere on the same virtual switch as the VMkernel network used for iSCSI traffic. This allows for a portion of iSCSI I/O to be served directly from the StoreVirtual VSA for vSphere to the iSCSI initiator without using a physical network.
- Locate the StoreVirtual VSA for vSphere on a virtual switch that is separate from the VMkernel network used for VMotion. This prevents VMotion traffic and StoreVirtual VSA for vSphere I/O traffic from interfering with each other and affecting performance.
- HP recommends installing vSphere Server on top of a redundant RAID configuration with a RAID controller that has battery-backed cache enabled. Do not use RAID 0.

## Unsupported configurations for StoreVirtual VSA for vSphere

- Use of VMware snapshots, VMotion, High-Availability, Fault Tolerance, or Distributed Resource Scheduler (DRS) on the StoreVirtual VSA for vSphere itself.
- Use of any vSphere Server configuration that VMware does not support.
- Extending the data virtual disk(s), vSphere Server SCSI 1:x, of the StoreVirtual VSA for vSphere while in a cluster. Create additional disks and hot-add them instead. See [“Adding storage capacity to a StoreVirtual VSA” \(page 24\)](#).
- Co-location of a StoreVirtual VSA for vSphere and other virtual machines on the same physical platform without reservations for the StoreVirtual VSA for vSphere CPUs and memory in vSphere.
- Co-location of a StoreVirtual VSA for vSphere and other virtual machines on the same VMFS datastore.
- Running StoreVirtual VSA for vSphere’s on top of existing HP StoreVirtual Storage is not recommended.

## Installing the HP StoreVirtual VSA for vSphere

Download and install the StoreVirtual StoreVirtual VSA for vSphere from the HP website:

[www.hp.com/go/StoreVirtualDownloads](http://www.hp.com/go/StoreVirtualDownloads)

The installer for the StoreVirtual VSA for vSphere includes a wizard that guides you through configuring the virtual machine on the network, configuring virtual or physical hard drives, and powering on the StoreVirtual VSA. The installer checks for the current HP StoreVirtual Centralized Management Console, and then installs it, if it is not on the system. (For instructions about installing the StoreVirtual StoreVirtual VSA for vSphere OVF version, see [“Installing the StoreVirtual VSA OVF version” \(page 14\)](#).)

**NOTE:**

- If a prior version CMC is installed on a management computer on the network, the StoreVirtual VSA for vSphere installer updates the CMC to the current version in the same location. The user-specified location entered in the installer wizard is ignored.

After the installation is complete, open the CMC and find the StoreVirtual VSAs as storage systems in the CMC. You can then set up the clustered storage for the SAN, as described in [“Getting started with HP StoreVirtual Storage” \(page 22\)](#).

**Table 5 Configuring the StoreVirtual VSA for vSphere using the installer wizard**

Installer step	Definition
Host Setup	vCenter Server that will host the StoreVirtual VSA. Enter either the IP address or host name of the server.
Select Host	List of vSphere hosts managed by the vCenter Server or single vSphere Server, and health status and configuration details for the host. Select the host the StoreVirtual VSA should be deployed to. If deploying more than one StoreVirtual VSA, you can chose to do so at the end of the wizard.
Type	<p>The type of virtual machine to install. Choices include the StoreVirtual VSA or the Failover Manager (FOM). The Virtual Storage Appliance (StoreVirtual VSA) is the storage system. The Failover Manager is a specialized version of the LeftHand OS software designed to operate as a manager and provide automated failover capability. See the <i>HP StoreVirtual Storage User Guide</i> for information about installing the Failover Manager (Failover Manager).</p> <p>If choosing the StoreVirtual VSA, you can also choose whether the StoreVirtual VSA should be Adaptive Optimization-capable and use multiple tiers of storage.</p>
Datastore	List of datastores available on the host. Select the desired datastore to store the virtual appliance files.
Network	<p>Network settings include the following information:</p> <ul style="list-style-type: none"> <li>• DNS name for the StoreVirtual VSA. The name for the StoreVirtual VSA must be 80 characters or less. Valid characters include a-z (case insensitive), 0–9, and –.</li> <li>• NIC to configure. Available NICs are eth0 and eth1. The StoreVirtual VSA for vSphere can support up to two NICs. <ul style="list-style-type: none"> <li>◦ IP address <p>A reserved IP address is recommended. Enter the IP address, subnet mask, and gateway. DHCP is supported. If you use DHCP, be sure to reserve statically assigned IP addresses for all storage systems on the DHCP server.</p> </li> <li>◦ The virtual network designated for the StoreVirtual VSA. Select the appropriate virtual network from the list.</li> </ul> </li> <li>• The NIC designated as the preferred interface for LeftHand OS, which is used for cluster communication and iSCSI host traffic. Select eth0 or eth1.</li> </ul>
Virtual Machine	<p>Information for creating the virtual machine, including the following:</p> <ul style="list-style-type: none"> <li>• Name for the virtual machine in (as it should appear in the VM inventory on the host or vCenter)</li> <li>• Type of drive mapping to storage which should be virtualized by the StoreVirtual VSA — Virtual Machine Disk Format (VMDK) or Raw Device Mapping (RDM)</li> </ul>
VMDK or Raw Disk	<p>Virtual or raw drive requirements</p> <ul style="list-style-type: none"> <li>• Maximum of 7 drives</li> <li>• Minimum size: 5 GB</li> <li>• Maximum size: 2047 GB in vSphere 5.0 or 5.1; 64 TB in vSphere 5.5</li> </ul> <p>Depending on which type of mapping was selected in the previous step, the wizard opens one of the following windows:</p> <p><b>Virtual hard drives window</b></p> <p>Select up to 7 virtual hard drives and designate the size.</p>

**Table 5 Configuring the StoreVirtual VSA for vSphere using the installer wizard** *(continued)*

Installer step	Definition
	<p>If configuring tiered storage, assign a tier to each drive. Tier 0 is the fastest tier.</p> <p><b>Raw Disk window</b></p> <p>Select up to 7 raw disks that you have prepared, and which are available. These drives must have no partitions or volumes on them, or the installer will not list them.</p> <p>If configuring tiered storage, assign a tier to each drive. Tier 0 is the fastest tier.</p> <p><b>IMPORTANT:</b></p> <ul style="list-style-type: none"> <li>• The raw disk size can be greater than 2 TB in VMware. However, the total amount of configured storage on the StoreVirtual VSA cannot exceed 50 TB or the RAID Stripe configuration will fail.</li> <li>• Be sure to plan the disk capacity in conjunction with the licensing for the StoreVirtual VSA. Storage capacity can be added but not removed. The purchased license controls the amount of storage that can be used regardless of the disk capacity. See <a href="#">Table 2 (page 5)</a>.</li> <li>• Every virtual disk should be RAID-protected and not configured with RAID 0. The RAID Stripe that is configured on the StoreVirtual VSA operates like RAID 0, and creates a pool of storage that has no redundancy across the drives.</li> </ul>

1. Double-click the downloaded executable to start the installation.
2. Click **Install VSA for VMware vSphere** to begin the wizard.
3. In the command line window that opens, enter **1** to run the installer CLI, or enter **2** to run the installer GUI. Both versions require the same information and perform the same installation.

**NOTE:** If you selected the GUI installation, the GUI installer window opens again and you click **Install VSA for VMware for vSphere** again to begin the wizard.

4. If necessary, enter the login credentials to allow the installer to configure the StoreVirtual VSA for vSphere on the vSphere server, and click **Yes**.
5. Accept the terms of the License Agreement again.
6. Work through the wizard to configure the parameters of the virtual machine on the network, including the hard drives. See [Table 5 \(page 13\)](#).
7. (Optional) Configure another StoreVirtual VSA for vSphere using the same parameters as appropriate.
8. Finish the installation, reviewing the configuration summary, and click **Deploy**.  
When the installer is finished, the StoreVirtual VSA for vSphere should be started on the vSphere hosts and should be discoverable in the CMC.
9. Use the Find function in the CMC to discover the StoreVirtual VSA for vSphere, and then add it to a management group.

## Installing the StoreVirtual VSA OVF version

Import the StoreVirtual StoreVirtual VSA for vSphere OVF version as a virtual appliance through the Virtual Infrastructure Client.

1. Download the .ovf zip file from the website:  
<http://www.hp.com/go/StoreVirtualDownloads>
2. Unzip the files.
3. Reserve the memory for the StoreVirtual VSA. See [“Memory requirements for StoreVirtual VSA disks” \(page 6\)](#) for memory requirements for StoreVirtual VSA disks.

## Configuring a data disk

1. In the vSphere Client, navigate to the Inventory Panel.
2. Click **Add** at the bottom of the Hardware tab.
3. Select **Hard Disk** as the type of device to add and click **Next**.

4. Select **Create a new virtual disk** and click **Next**.
5. In the Disk Capacity section, designate a capacity that is suitable for the amount of storage available on your vSphere Server.
6. In the Location section, select **Store with Virtual Machine**, and click **Next**.
7. For the first disk, select the Virtual Device Node to be SCSI 1:0 from the list. For additional disks, assign SCSI 1:1 through 1:6, in sequential order.

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**⚠ CAUTION:** Selecting anything other than SCSI 1:0 for the first disk causes RAID to be unconfigurable later.

---

8. Select **Mode**→**Independent**→**Persistent** and click **Next**.
9. Review the device configuration and click **Finish**.

## Powering on the StoreVirtual VSA for vSphere and setting the IP address and host name

1. In the inventory panel, select the new StoreVirtual VSA for vSphere and power it on.
2. Select the **Console** tab and wait for the StoreVirtual VSA for vSphere to boot.
3. When the StoreVirtual VSA for vSphere finishes booting, enter **Start** and press **Enter** to log in to the Configuration Interface.
4. On the Configuration Interface main menu, press **Tab** to select **Network TCP/IP Settings** and press **Enter**.
5. On the Available Network Devices window, press **Tab** to select the applicable network interface and press **Enter**.
6. On the Network Settings window, press **Tab** to select the **Hostname** box and enter a host name for the StoreVirtual VSA. Use backspace to erase an entry if necessary.  

This host name displays in the CMC only. It does not change the name of the original .vmx file or the name of the virtual machine in the VMware interface.
7. Press **Tab** to select the method for setting the IP address.  

If you are entering a static IP address, note that Gateway is a required field. If you do not have a gateway, enter 0.0.0.0.
8. Press **Tab** to select **OK** and press **Enter**.
9. Press **Enter** again to confirm the action.
10. After the settings are configured, press **Enter** to confirm the IP address change.
11. On the Available Network Devices window, press **Tab** to select **Back** and press **Enter**.
12. On the Configuration Interface, press **Tab** to select **Log Out** and press **Enter**.

## Verifying the IP address and host name

1. In the vSphere Client Information Panel, select the **Summary** tab.
2. In the General section on the Summary tab, verify that the IP address and host name are correct, and that VMware Tools are running.

---

**NOTE:** If VMware Tools show out of date or Unmanaged, then they are running correctly. These statuses are not a problem, because the tools are available and running. VMware tools are updated with each LeftHand OS software upgrade.

---

# Troubleshooting the StoreVirtual VSA for vSphere

**Table 6 Troubleshooting the StoreVirtual VSA for vSphere**

Problem	Solution
You want to reinstall the StoreVirtual VSA.	<ol style="list-style-type: none"> <li>1. Close your CMC session.</li> <li>2. In the vSphere Client, power off the StoreVirtual VSA.</li> <li>3. Right-click and select <b>Delete from Disk</b>.</li> <li>4. Copy fresh files into the virtual machine folder from the downloaded .zip file.</li> <li>5. Open VMware and begin again.</li> </ol>
You cannot find the HP StoreVirtual VSA for vSphere with the CMC, and cannot recall its IP address.	In the VMware Console, open the Configuration Interface. Navigate to the Network Settings window to verify the IP address.
You cannot configure RAID.	Verify that the HP StoreVirtual VSA for vSphere has a virtual disk configured on SCSI 1:0. StoreVirtual VSAs use SCSI 0:0 for operating system disks. They use the disk configured for SCSI 1:0 for SAN data storage. If no SCSI disk is configured for SCSI 1:0 then RAID cannot be configured on the appliance.
You cannot run concurrent StoreVirtual VSA Installers and use the same name for the StoreVirtual VSAs on the same host you are creating.	The best practice is to use a unique name for each instance of the StoreVirtual VSA that you create.
LeftHand OS upgrades fail because persistent disk identifiers are not enabled.	<p>Follow these steps to enable the persistent disk identifiers for each HP StoreVirtual VSA for vSphere:</p> <ol style="list-style-type: none"> <li>1. From the CMC, power off the StoreVirtual VSA.</li> <li>2. Open the VMware vSphere Client, and log into a vCenter Server or ESX Server.</li> <li>3. Verify that the virtual machine is powered off.</li> <li>4. Right-click the virtual machine and select <b>Edit Settings</b>.</li> <li>5. Click the <b>Options</b> tab and select the <b>General</b> entry in the settings column (under the Advanced entry).</li> <li>6. Click <b>Configuration Parameters</b>.</li> <li>7. Click <b>Add Row</b>.</li> <li>8. In the Name column, enter <b>disk.Enable UUID</b>.</li> <li>9. In the Value column, enter <b>True</b>.</li> <li>10. Click <b>OK</b> and then click <b>Save</b>.</li> <li>11. Power on the virtual machine in the vSphere Client.</li> </ol>
<b>In Windows</b>	
The Installation wizard freezes.	<p>Reset the Hardware Acceleration in Windows:</p> <ol style="list-style-type: none"> <li>1. Open the <b>Windows Display Settings→Advanced settings→Troubleshoot</b> tab.</li> <li>2. Move the Hardware Acceleration slider to one notch above None.</li> <li>3. Click <b>OK</b> twice to exit the Properties dialog.</li> <li>4. Restart the Installation wizard.</li> </ol>
<b>In Linux</b>	
The installer does not start automatically.	Run <code>CMC_Installer.bin</code> again.
<b>In vSphere Client</b>	



**Table 6 Troubleshooting the StoreVirtual VSA for vSphere** *(continued)*

Problem	Solution
Mouse and keyboard are not responding or are "trapped" in the StoreVirtual VSA.	If your cursor is missing, you are in console mode. Press <b>Ctrl-Alt</b> to regain the cursor. If your keyboard is missing, move the mouse to the console window and click once.
You want to see your HP StoreVirtual VSA for vSphere, but the window is black.	<ul style="list-style-type: none"><li>• You are in the Console view of the guest window. Change to the Summary view.</li><li>• Your Console window has timed out. Click in the window with the mouse and then press <b>Backspace</b>.</li></ul>

---

## 3 Installing the HP StoreVirtual VSA for Hyper-V

The HP StoreVirtual VSA for Hyper-V is pre-formatted for use with Microsoft® Windows® Server. Install the StoreVirtual VSA for Hyper-V on a Windows server configured with redundant RAID. If you are using an evaluation copy and want to continue using the fully-featured StoreVirtual VSA for Hyper-V after the trial period has ended, you must purchase a license key. After you apply the license key, your configuration can be used as is in a production environment, or reconfigured if necessary.

### Supported versions of Microsoft Windows Server

All operating systems listed are 64-bit. HP StoreVirtual VSA for Hyper-V is supported on 64-bit systems only.

- Windows Server 2012
- Windows Server 2012 R2
- Microsoft Hyper-V Server 2008 R2
- Windows Server 2008 R2 Standard
- Windows Server 2008 R2 Enterprise
- Windows Server 2008 R2 Datacenter
- Windows Server 2008 R2 Server Core
- Windows Server 2008 SP2, except for Core, which is not supported
- Core and Full installation are supported on Windows Server 2008 R2 and later

### Configuration requirements for the StoreVirtual VSA for Hyper-V

- A qualified server for Microsoft Hyper-V.  
To verify the server is listed and qualified for Hyper-V Server, go to <http://windowsservercatalog.com/results.aspx?&bCatID=1283&cplD=0&avc=11&ava=0&OR=1&PGS=25>, and then search for "Hyper-V" as an additional qualification. See the supported Windows versions.
- Virtual disk(s) with 5GB to 50TB (up to 50TB for Windows Server 2012 and higher; up to 2TB for Windows Server 2008 R2 and prior) of space per disk located on internal disk storage, or direct attached storage that is not accessible from more than one physical server. (Note that the LeftHand OS software consumes a small amount of the available space.)
- StoreVirtual VSA for Hyper-V virtual disks must be fixed, not dynamic.
- Microsoft .NET 3.5 on the installer client
- The NTFS partition for the StoreVirtual VSA must not be shared with any other VMs.
- Define the install paths for the Hyper-V virtual machine and the virtual hard disks.

- On Windows Server 2008 R2, ensure the following hotfixes are applied before beginning the installation: KB 979711, KB 975530, KB 981836. See the following Microsoft KnowledgeBase articles:
  - <http://support.microsoft.com/kb/979711>
  - <http://support.microsoft.com/kb/975530>
  - <http://support.microsoft.com/kb/981836>
- If using physical disks for the StoreVirtual VSA for Hyper-V, ensure that:
  - The disks are completely clean of any partitions or any other remnants prior to running the StoreVirtual VSA for Hyper-V installer.
  - The disks are connected, but offline in Windows Disk Manager before starting the installer.

## Best practices for StoreVirtual VSA for Hyper-V

- Configure the StoreVirtual VSA for Hyper-V to start automatically and first, and before any other virtual machines. The default installation configuration for the StoreVirtual VSA for Hyper-V is set to automatically start if it was running when the server shut down.
- For the StoreVirtual VSA for Hyper-V, dedicate a virtual network for iSCSI traffic.
- HP recommends installing Hyper-V Server on top of a redundant RAID configuration with a RAID controller that has battery-backed cache enabled. Do not use RAID 0.

## Unsupported configurations for StoreVirtual VSA for Hyper-V

- Use of Microsoft Live Migration, Quick Migration, or snapshots on the StoreVirtual VSA itself.
- Use of any Hyper-V Server configuration that Microsoft does not support.
- Extending the data virtual disk(s), the first SCSI Controller in Hyper-V, of the StoreVirtual VSA while in a cluster. Create additional disks and hot-add them instead. See [“Adding storage capacity to a StoreVirtual VSA” \(page 24\)](#).
- Co-location of a StoreVirtual VSA and other virtual machines on the same NTFS partition.
- Running StoreVirtual VSA for Hyper-Vs on top of existing HP StoreVirtual Storage is not recommended.

## Installing the HP StoreVirtual VSA for Hyper-V

Download and install the HP StoreVirtual VSA for Hyper-V from the HP website:

[www.hp.com/go/StoreVirtualDownloads](http://www.hp.com/go/StoreVirtualDownloads)

The installer for the StoreVirtual VSA for Hyper-V includes a wizard that guides you through configuring the virtual machine on the network, configuring virtual or physical hard drives, and powering on the StoreVirtual VSA for Hyper-V. After finishing the installation, install the CMC and find the StoreVirtual VSAs as storage systems in the CMC. You can then set up the clustered storage for the SAN, as described in [“Getting started with HP StoreVirtual Storage” \(page 22\)](#).

---

**NOTE:** One or more Microsoft hotfixes may be required on your system before you can install the StoreVirtual VSA for Hyper-V. If this is the case, before the installer actually begins, a window opens that notifies you of the required hotfixes and provides links to the appropriate site to download the hotfix.

---

**Table 7 Configuring the StoreVirtual VSA for Hyper-V using the installer wizard**

Installer Step	Definition
Hotfix required	One or more Microsoft hotfixes that must be installed before installing the StoreVirtual VSA for Hyper-V.
Type	<p>The type of virtual machine to install. Choices include the StoreVirtual VSA or the Failover Manager (FOM). The Virtual Storage Appliance (StoreVirtual VSA) is the storage system. The Failover Manager is a specialized version of the LeftHand OS software designed to operate as a manager and provide automated failover capability. See the <i>HP StoreVirtual Storage User Guide</i> for information about installing the Failover Manager (Failover Manager).</p> <p>If choosing the StoreVirtual VSA, you can also choose whether the StoreVirtual VSA should be Adaptive Optimization-capable and use multiple tiers of storage.</p>
Destination	Locations for the virtual machine and the virtual disks.
Network	<p>Includes the following network information:</p> <ul style="list-style-type: none"> <li>Host name for the StoreVirtual VSA for Hyper-V.</li> <li>IP address.</li> </ul> <p>Reserved IP address is recommended. DHCP is available. If you use DHCP, be sure to reserve statically assigned IP addresses for all storage systems on the DHCP server.</p> <ul style="list-style-type: none"> <li>The virtual network designated for the virtual machines. Select the appropriate network from the list.</li> </ul> <p><b>NOTE:</b> The installer for the StoreVirtual VSA for Hyper-V only configures one virtual network interface. However, an additional virtual network interface can be added manually via the virtual machine settings.</p>
Virtual machine	<p>Information for creating the virtual machine, including the following:</p> <ul style="list-style-type: none"> <li>Name for the virtual machine in Hyper-V</li> <li>Type of hard drives, virtual or physical</li> <li>Check box to power on the StoreVirtual VSA for Hyper-V after it is installed</li> </ul>
Hard drives, either virtual or physical	<p>Virtual or physical drive requirements</p> <ul style="list-style-type: none"> <li>Maximum of 7 drives</li> <li>Minimum size: 5 GB</li> <li>Maximum size: 2040 GB or 64 TB in Windows Server 2012</li> </ul> <p>One of two windows opens, depending on which type of drives were selected in the Virtual machine window.</p> <p><b>Virtual hard drives window</b></p> <p>Select up to 7 virtual hard drives and designate the size.</p> <p>If configuring tiered storage, assign a tier to each drive. Tier 0 is the fastest tier.</p> <p><b>Physical Drives window</b></p> <p>Select up to 7 physical drives that you have prepared, and which are offline. These drives must have no partitions or volumes on them, or the installer will not list them. To reuse HVSA disks for expanding storage on a new HVSA, partitions must first be manually deleted.</p> <p>If configuring tiered storage, assign a tier to each drive. Tier 0 is the fastest tier.</p> <p><b>IMPORTANT:</b></p> <ul style="list-style-type: none"> <li>The total amount of configured storage on the StoreVirtual VSA for Hyper-V cannot exceed 50 TB or RAID Stripe will fail.</li> <li>Be sure to plan the disk capacity in conjunction with the licensing for the StoreVirtual VSA. Storage capacity can be added but not removed. The purchased license controls the amount of storage that can be used regardless of the disk capacity. See <a href="#">Table 2 (page 5)</a>.</li> <li>Every virtual disk should be RAID-protected and not configured with RAID 0. The RAID Stripe that is configured on the StoreVirtual VSA operates like RAID 0, and creates a pool of storage that has no redundancy across the drives.</li> </ul>

1. Double-click the downloaded executable to start the installation.

2. Accept the terms of the License Agreement.
3. Configure the parameters of the virtual machine on the network, including the hard drives. See [Table 7 \(page 20\)](#).

---

**NOTE:** You can run the wizard again to configure another StoreVirtual VSA for Hyper-V using the same parameters as appropriate.

---

4. Finish the installation, reviewing the configuration summary.  
When the installer is finished, the StoreVirtual VSA for Hyper-V is ready to be used in HP StoreVirtual Storage.
5. Next, install the CMC, described in [“Getting started with HP StoreVirtual Storage” \(page 22\)](#). Then follow the steps in [“Installing the CMC” \(page 22\)](#).  
The installer may take a few minutes to complete, depending upon the underlying hardware.

## Troubleshooting the StoreVirtual VSA for Hyper-V

**Table 8 Troubleshooting the StoreVirtual VSA for Hyper-V**

Problem	Solution
While installing the StoreVirtual VSA for Hyper-V, you do not see the physical disks you prepared.	<ol style="list-style-type: none"> <li>1. Close the installer.</li> <li>2. Verify that the disks are offline.</li> <li>3. Start the installer again.</li> </ol>
StoreVirtual VSA for Hyper-V reboot fails if the physical disk of the StoreVirtual VSA for Hyper-V is an iSCSI mounted volume	Do not use an iSCSI volume on a SAN as the physical disk for a StoreVirtual VSA.
You want to reinstall the StoreVirtual VSA for Hyper-V.	Using the Hyper-V Manager: <ol style="list-style-type: none"> <li>1. Close your CMC session.</li> <li>2. In the Hyper-V Manager, power off the StoreVirtual VSA for Hyper-V.</li> <li>3. Right-click and select <b>Delete from Disk</b>.</li> <li>4. Optional: Delete the <code>.vhd</code> files to recover the disk space.</li> <li>5. Rerun the <code>.exe</code> file and reinstall the StoreVirtual VSA for Hyper-V.</li> <li>6. Open the Hyper-V Manager and begin again.</li> </ol>
You cannot find the StoreVirtual VSA for Hyper-V with the CMC, and cannot recall its IP address.	Open the Configuration Interface. Navigate to the Network Settings window to verify the IP address.

---

## 4 Getting started with HP StoreVirtual Storage

### Installing the CMC

Install the CMC on the computer or virtual machine that you use to administer the HP StoreVirtual Storage. You administer the entire network of StoreVirtual VSAs from this CMC. To obtain the CMC, download the CMC installer from the following website:

<http://www.hp.com/go/StoreVirtualDownloads>

The CMC installation requires 63 MB disk space and 64 MB RAM during runtime.

### Installing the CMC in Microsoft Windows

1. Start the CMC installer.
2. Follow the steps in the installation wizard.
3. When the installation completes, HP is added as a separate Program Group and a shortcut icon is added to the Microsoft Windows desktop.

To start the CMC:

- Double-click the icon on your desktop, or
- From the Start menu, select **All Programs**→**HP** →**HP StoreVirtual**→**HP StoreVirtual Centralized Management Console**.

### Installing the CMC in Linux

You must be running the X Window System to install the application.

1. Click the CMC installer.
2. Follow the steps in the installation wizard.
3. When the installation completes, HP is added as a separate Program Group.

To start the CMC:

From the directory in which you installed the files, run the script `./HP_StoreVirtual_Centralized_Management_Console`.

### Getting started with the CMC

The CMC is configured to find all StoreVirtual VSA and physical storage systems on the subnets which the system running the CMC is connected to. The first time you open the CMC, it automatically finds all the storage systems and they appear in the Navigation pane.

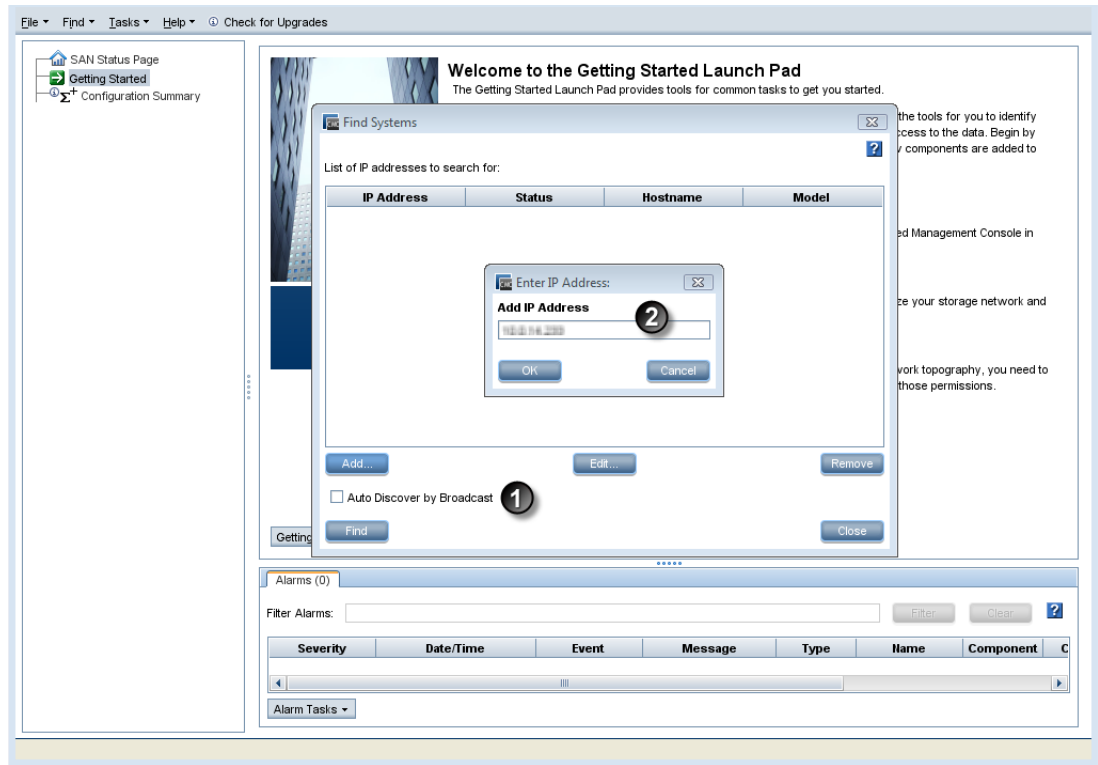
To control which storage systems appear in the CMC, change the configuration using the following steps.

1. Open the CMC.

2. Click **Find Systems** on the Getting Started Launch Pad.  
In the Find Systems window, use these features to control the list of storage systems:

  - Clear **Auto Discover by Broadcast** to prevent the entire subnet of storage systems from appearing in the Navigation pane.
  - If your storage systems are on another subnet, add individual IP addresses of storage systems that you want to appear in the Navigation pane.

**Figure 4 Editing Find Systems to control the storage systems displayed**



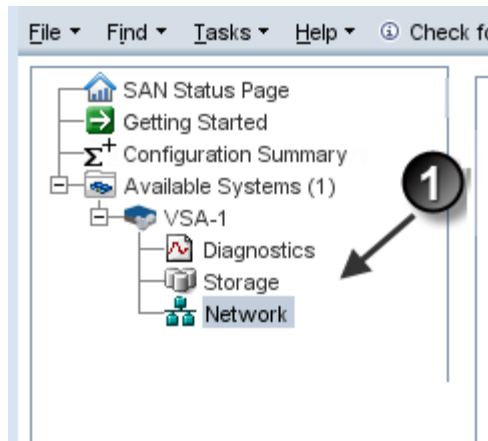
1. Clear Auto Discover by Broadcast
2. Add IP addresses for specific storage systems

## Completing the StoreVirtual VSA hardware configuration

When you install the HP StoreVirtual Centralized Management Console, you should configure the storage system features, such as RAID, bonding the NICs, and setting up email alert notification, before you configure the data storage.

Complete the hardware configuration before adding the StoreVirtual VSA to a management group. Select the StoreVirtual VSA in the Navigation pane to expand the hardware configuration categories. Verify that RAID Stripe is configured. Verify that the network settings are correct.

**Figure 5 Configuring the hardware**



1. Configure RAID and the network from these categories

## Creating a StoreVirtual cluster

Use the Management Groups, Clusters, and Volumes wizard on the Getting Started Launch Pad to create your storage pool. The wizard has online help available on each page.

## Reviewing the Best Practice Summary

Use the Best Practice Summary on the SAN Status Page in the CMC to review your configuration and to ensure you are following best practices for the disk RAID and Network RAID configurations, as well as network configurations and the overall configuration. The Best Practice Summary provides an easy-to-use reference about best practices that can increase the reliability and performance of your configurations. Move the mouse over a best practice item to see an explanation of the best practice.

1. Navigate to the SAN Status Page in the CMC.
2. Log in to the management group to verify the Best Practices for that management group.

## Adding storage capacity to a StoreVirtual VSA

Add storage capacity to a StoreVirtual VSA by adding up to 6 additional virtual disks for a total of 7 disks. Ensure that if you add capacity to a StoreVirtual VSA in a cluster, you balance the capacity of all the storage systems in the cluster, i.e. all storage systems should have the same capacity. See [“Using StoreVirtual VSAs and HP StoreVirtual 4000 Storage” \(page 8\)](#) for information about storage capacity and platforms in a cluster.

The following steps describe how to add disks after the StoreVirtual VSA has been added to a management group and cluster. However, you can add the disks to the StoreVirtual VSA when you first configure it, before you use it for clustered storage.

**NOTE:** When adding new capacity to the StoreVirtual VSA, make sure you have the right license to accommodate the capacity. See [Table 2 \(page 5\)](#).

If you have upgraded to LeftHand OS version 11.0 from version 9.0, it is necessary to change the iSCSI controller to a paravirtual adapter to allow for disks to be added while the StoreVirtual VSA is powered on. To make this change, open the vSphere client on the vSphere server from which the StoreVirtual VSA is being deployed. Right-click the StoreVirtual VSA and select **Edit settings**. Change the adapter type from iSCSI controller to paravirtual adapter.

## Creating additional disks

Create up to 6 additional disks for a StoreVirtual VSA. The additional disks can be added to the StoreVirtual VSA in the CMC, while the StoreVirtual VSA is powered on.



- 
- ❗ **IMPORTANT:** Hot-addition of disks is not supported in VMware configurations where the storage controller is LSI Logic SCSI. Hot-add is supported on StoreVirtual VSAs which run LeftHand OS 11.0 and higher with Paravirtual SCSI (PVSCSI) adapters.
- 

## Requirements

- Minimum disk size—5 GB
- Maximum disk size
  - 2047 GB for vSphere Server 5.0 or 5.1, 64 TB for vSphere Server 5.5
  - 2040 GB for Hyper-V for Windows Server 2008, 64 TB for Hyper-V for Windows Server 2012
- If reusing disks from a different StoreVirtual VSA, you must ensure that there are no partitions or volumes on those disks.
- Created sequentially as follows:
  - vSphere Server—from SCSI 1:1 through SCSI 1:6. This assumes that the first disk has already been created and assigned to SCSI 1:0.
  - Hyper-V—locations 1 through 6 to SCSI Controller 0. This assumes that the first disk has already been created in SCSI Controller 0, location 0.

- 
- ❗ **IMPORTANT:** If you are adding disks to StoreVirtual VSAs that are already in a cluster, be aware that the process may take more time and that the CMC does not prevent multiple storage systems in a cluster from being taken offline. When adding a disk, the storage system is restarted and the new disk is formatted. The format operation may take a long time to complete if the new disk is large. New writes are then resynchronized with the other storage systems in the cluster, which can impact performance. If it is a cluster with a single storage system, the volumes will go offline. Further, HP recommends that you do not add another new disk until the previous disk addition has completed. This ensures that there is no loss of quorum. You should also add disks to only one StoreVirtual VSA at a time. Wait until the first StoreVirtual VSA has finished resynchronizing and the cluster is healthy before adding disks to another StoreVirtual VSA.
- 

## Creating the disk

1. Using either the vSphere Client, or Microsoft Hyper-V Manager, add from 1 to 6 disks to the StoreVirtual VSA.
2. Assign each disk to the next sequential SCSI address or location.
3. Configure the disks as follows:
  - vSphere Server disks as independent and persistent
  - Hyper-V disks as fixed size
4. Increase memory based on the total capacity of the StoreVirtual VSA, according to the requirements in [Table 3 \(page 6\)](#).

## Adding disks to RAID

A new disk appears as Uninitialized in the Disk Setup tab of the Storage configuration category. Add the new disk to RAID, which automatically powers the disk on.

1. In the CMC, navigate to the StoreVirtual VSA.
2. Select the Storage configuration category and select the **Disk Setup** tab.

3. Select the disk to add to RAID.

Disks must be added to RAID sequentially. For example, you cannot add disk 3 to RAID if disk 2 has not been added.

4. Right-click and select **Add Disk to RAID**.

## Documentation available

For detailed instructions about using the CMC and the StoreVirtual VSA, see the following resources. You can find these documents on the following website:

<http://www.hp.com/support/StoreVirtualManuals>

- HP StoreVirtual Storage Online Help  
All User Guide content is contained in the HP StoreVirtual Storage Online Help, available from the menu bar under **Help→Help Topics**. Context sensitive help is available by clicking the question mark on any window ( ? ).
- HP StoreVirtual Storage User Guide  
The *HP StoreVirtual Storage User Guide* provides detailed instructions for using the LeftHand OS software to create, access and manage the clustered data storage.
- HP StoreVirtual Storage Remote Copy User Guide  
The *HP StoreVirtual Storage Remote Copy User Guide* provides instructions for using the Remote Copy capabilities of the LeftHand OS software.
- HP StoreVirtual Storage Multi-Site Configuration Guide  
The *HP StoreVirtual Storage Multi-Site Configuration Guide* provides instructions for configuring and using the HP StoreVirtual Multi-Site SAN.

## 5 Using the VMware StoreVirtual VSA laptop demo

The StoreVirtual VSA laptop demo is the smallest and most portable version of the LeftHand OS software virtual appliance. It is intended to demonstrate all the capabilities of HP StoreVirtual Storage (physical storage appliances as well as StoreVirtual VSA), including storage clustering and data protection features on VMware Workstation or Player. When using advanced features, it will run for a limited time of 60 days.

**NOTE:** There is not a separate demo version of the HP StoreVirtual VSA for Hyper-V Server.

The StoreVirtual VSA laptop demo can be used indefinitely as a single storage system iSCSI target with snapshots. If a configuration is deleted and recreated, the trial period of licensed features starts again.

To demo HP StoreVirtual VSA for vSphere, download the time-limited trial version and follow the instructions in “[Installing the HP StoreVirtual VSA for vSphere](#)” (page 11) to set up virtual HP StoreVirtual Storage. Adding a license removes the time restriction of the trial license.

The laptop demo of the StoreVirtual VSA runs a full-featured version of the LeftHand OS software, and provides the following capabilities:

- Use of the LeftHand OS software without requiring physical storage devices.
- Use of advanced LeftHand OS software features such as Clustering, Network RAID, application-managed snapshots, thin provisioning, Remote Copy and Multi-Site SAN.

The demo is available at [www.hp.com/go/tryvsa](http://www.hp.com/go/tryvsa).

### Requirements for the demo

- The demo StoreVirtual VSA is supported on 64-bit systems only
- Minimum of 3 GB of RAM
- One virtual CPU with 2 GHz reserved
- A dedicated gigabit virtual switch
- 5 GB to 2 TB of disk space per virtual disk, up to 10 TB total per virtual storage appliance
- VMware Player, Workstation
- IP address, subnet mask, and gateway for the virtual machine

### Planning the demo installation

Before you install the StoreVirtual VSA, plan the virtual network configuration.

- Virtual appliance directories, host names and IP addresses – Create a directory for each virtual machine on the hard drive you will use as the storage system.
- Network configuration – Plan the subnet and IP address for the virtual machines as well as for the VIPs required for storage clusters.
- Storage configuration – Install the CMC on Linux or Microsoft Windows. Then use the CMC to find storage systems, create storage, and connect to application servers.

### Installing the StoreVirtual VSA

To install the laptop demo of the StoreVirtual VSA, you will:

- Unzip to the prepared directory and start the virtual machine.
- Direct the Ethernet port to NAT (default), Host-only, or bridged.
- Set the IP address and host name of the StoreVirtual VSA.

You only need to configure each virtual machine once.

1. Copy or download the StoreVirtual VSA .zip file.
2. Copy or unzip the StoreVirtual VSA files to the virtual machine directory.

---

**NOTE:** Copy the files to multiple directories for multiple VSAs.

---

## Configuring the StoreVirtual VSA with VMware Player or VMware Workstation

1. Open the VMware console.
2. Click **File**→**Open** to open the VSA .vmx file.
3. Navigate to the location of the unzipped StoreVirtual VSA files.
4. Select the VSA .vmx file and click **Open**.
5. Edit the StoreVirtual VSA settings as required by the VMware console you are using. Select the appropriate network mode:
  - Bridged
  - NAT
  - Host-only

---

**NOTE:** All StoreVirtual VSAs on the same platform should use the same networking mode. When running multiple StoreVirtual VSAs on a single host, use NAT or Host-only networking mode, and use DHCP to assign IP addresses to the StoreVirtual VSAs.

---

6. Power on the StoreVirtual VSA.
7. Use the Configuration Interface to set the IP address and host name as described in [“Powering on the StoreVirtual VSA for vSphere and setting the IP address and host name”](#) (page 15):

## Upgrading the StoreVirtual VSA demo

StoreVirtual VSAs that run on VMware Workstation or VMware Player cannot be upgraded. However, you can download and install the updated version from the HP StoreVirtual downloads page.

---

## 6 Support and other resources

### Contacting HP

For worldwide technical support information, see the HP support website:

<http://www.hp.com/support>

Before contacting HP, collect the following information:

- Product model names and numbers
- Technical support registration number (if applicable)
- Product serial numbers
- Error messages
- Operating system type and revision level
- Detailed questions

### Subscription service

HP recommends that you register your product for HP Support Alerts at:

<http://www.hp.com/go/e-updates>

After registering, you will receive e-mail notification of product enhancements, new driver versions, firmware updates, and other product resources.

### HP Insight Remote Support

HP strongly recommends that you register your device for remote support to enable enhanced delivery of your HP Warranty, HP Care Pack Service, or HP contractual support agreement. HP Insight Remote Support supplements your monitoring continuously to ensure maximum system availability by providing intelligent event diagnosis, and automatic, secure submission of hardware event notifications to HP, which will initiate a fast and accurate resolution, based on your product's service level. Notifications can be sent to your authorized HP Channel Partner for onsite service, if configured and available in your country.

HP Insight Remote Support is available as part of your HP Warranty, HP Care Pack Service, or HP contractual support agreement. For more information, see the product documentation on the HP website (<http://www.hp.com/go/insightremotesupport/docs>).

## Related information

You can find related documents on the product manuals page:

<http://www.hp.com/support/StoreVirtualManuals>

You can also find related documents on the Storage Information Library:

<http://www.hp.com/go/storage/docs>

## HP websites

For additional information, see the following HP websites:

- <http://www.hp.com>
- <http://www.hp.com/go/storage>
- [http://www.hp.com/service\\_locator](http://www.hp.com/service_locator)
- <http://www.hp.com/go/StoreVirtualDownloads>
- <http://www.hp.com/go/storevirtualcompatibility>
- <http://www.hp.com/storage/whitepapers>

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## 7 Documentation feedback

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