

StarWind Virtual SAN: Configuration Guide for VMware vSphere [ESXi], VSAN Deployed as a Controller VM using PowerShell CLI

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TECHNICAL PAPERS



StarWind Virtual SAN: Configuration Guide for VMware vSphere [ESXi], VSAN Deployed as a Controller VM using PowerShell CLI



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About StarWind

StarWind is a pioneer in virtualization and a company that participated in the development of this technology from its earliest days. Now the company is among the leading vendors of software and hardware hyper-converged solutions. The company's core product is the years-proven StarWind Virtual SAN, which allows SMB and ROBO to benefit from cost-efficient hyperconverged IT infrastructure. Having earned a reputation of reliability, StarWind created a hardware product line and is actively tapping into hyperconverged and storage appliances market. In 2016, Gartner named StarWind "Cool Vendor for Compute Platforms" following the success and popularity of StarWind HyperConverged Appliance. StarWind partners with world-known companies: Microsoft, VMware, Veeam, Intel, Dell, Mellanox, Citrix, Western Digital, etc.

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Annotation

Relevant Products

This guide applies to StarWind Virtual SAN and StarWind Virtual SAN Free (Version V8 (Build 15260, OVF Version 20230901) and earlier).

For newer versions of StarWind Virtual SAN (Version V8 (Build 15260, CVM Version 20231016) and later), please refer to this configuration guide: StarWind Virtual SAN: Configuration Guide for VMware vSphere [ESXi], VSAN Deployed as a Controller Virtual Machine (CVM) using PowerShell CLI

Purpose

This guide describes the process for the deployment of StarWind Virtual SAN on VMware vSphere, with VSAN set up as a Controller Virtual Machine (CVM). It offers key insights and steps to ensure a seamless deployment.

Audience

Designed for IT specialists, system administrators, and VMware professionals, seeking to proficiently set up StarWind Virtual SAN on VMware vSphere.

Expected Result

Upon completion of this guide, users will get a fully configured VMware vSphere environment with StarWind Virtual SAN as a Controller Virtual Machine (CVM).

Starwind Virtual San For Vsphere Vm Requirements

Prior to installing StarWind Virtual SAN Virtual Machines, please make sure that the system meets the requirements, which are available via the following link: https://www.starwindsoftware.com/system-requirements

Storage provisioning

guidelines: https://knowledgebase.starwindsoftware.com/guidance/how-to-provision-phys ical-storage-to-starwind-virtual-san-controller-virtual-machine/

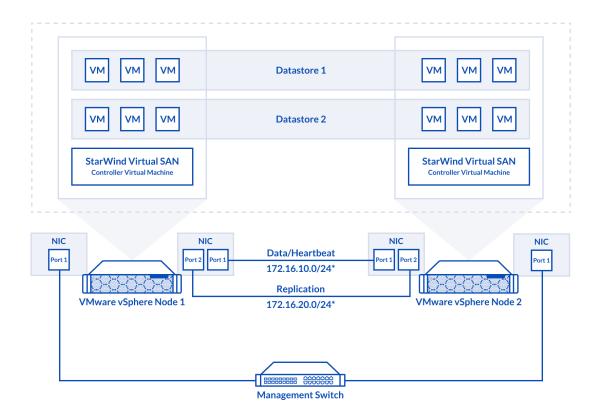
Recommended RAID settings for HDD and SSD disks: https://knowledgebase.starwindsoftware.com/guidance/recommended-raid-settings-for-h dd-and-ssd-disks/



Please read StarWind Virtual SAN Best Practices document for additional information: https://www.starwindsoftware.com/resource-library/starwind-virtual-san-best-practices

Pre-Configuring The Servers

The diagram below illustrates the network and storage configuration of the solution:



1. ESXi hypervisor should be installed on each host.

2. StarWind Virtual SAN for vSphere VM should be deployed on each ESXi host from an OVF template, downloaded on this page: https://www.starwindsoftware.com/release-notes-build

3. The network interfaces on each node for Synchronization and iSCSI/StarWind heartbeat interfaces should be in different subnets and connected directly according to the network diagram above. Here, the 172.16.10.x subnet is used for the iSCSI/StarWind

heartbeat traffic, while the 172.16.20.x subnet is used for the Synchronization traffic. NOTE: Do not use iSCSI/Heartbeat and Synchronization channels over the same physical link. Synchronization and iSCSI/Heartbeat links and can be connected either via redundant switches or directly between the nodes.

vCenter Server can be deployed separately on another host or as VCSA on StarWind VSAN highly-available storage, created in this guide.

Preparing Environment For Starwind Vsan Deployment

Configuring Networks

Configure network interfaces on each node to make sure that Synchronization and iSCSI/StarWind heartbeat interfaces are in different subnets and connected physically according to the network diagram above. All actions below should be applied to each ESXi server.

NOTE: Virtual Machine Port Group should be created for both iSCSI/ StarWind Heartbeat and the Synchronization vSwitches. VMKernel port should be created only for iSCSI traffic. Static IP addresses should be assigned to VMKernel ports.

NOTE: It is recommended to set MTU to 9000 on vSwitches and VMKernel ports for iSCSI and Synchronization traffic. Additionally, vMotion can be enabled on VMKernel ports.

1. Using the VMware ESXi web console, create two standard vSwitches: one for the iSCSI/ StarWind Heartbeat channel (vSwitch1) and the other one for the Synchronization channel (vSwitch2).



vmware: Esxi"			
Ta Navigator	Q Networking		
✓ ☐ Host Manage Monitor		Physical NICs VMkernel NICs TCP/IP stacks Firewall rules Id uplinik Z Edit settings C Refresh S Actions	
🕨 🚰 Virtual Machines 🛛 🛛 🛛	Name	✓ Port groups	
Storage	vSwitch0	2	
Networking 1			
	Add standard virtual switch - v Swit	tch1	
	Add uplink		
	vSwitch Name	vSwitch1	
	MTU	9000	
	Uplink 1	vmnic1 - Up, 10000 mbps	3
	Link discovery	Click to expand	
	➤ Security	Click to expand	
		Add Cance	
			_

2. Create a VMKernel port for the iSCSI/ StarWind Heartbeat channel.

👰 sw-mar-pc3.starwind.loca	I - Networking	
Port groups Virtual sw	vitches Physical NICs VMke	ernel NICs TCP/IP stacks Firewall rules
🚘 Add VMkernel NIC	Add VMkernel NIC	
Name	Port group	New port group
	New port group	ISCSI_VMKernel
	Virtual switch	vSwitch1
	VLAN ID	0
	MTU	9000
	IP version	IPv4 only
	✓ IPv4 settings	
	Configuration	O DHCP Static
	Address	172.16.10.251
	Subnet mask	255.255.255.0
	TCP/IP stack	Default TCP/IP stack
	Services	✓ vMotion
		Create Cancel



3. Add a Virtual Machine Port Groups on the vSwitch for iSCSI traffic (vSwtich1) and on the vSwitch for Synchronization traffic (vSwitch2).

Portgroup ISCSI_for_VMs remove	ed - dismiss for VMs						
▼ 🗐 Host	Port groups Virtual switches	Physical NICs VMkerne	el NICs TCP/IP stacks	Firewall rules			
Manage Monitor	🧕 Add port group 🥒 Edit settings	🧕 Add port group 🥒 Edit settings 📔 🥐 Refresh 📔 🍈 Actions					
> 🖶 Virtual Machines 🛛 🕕	Name	~	Active ports ~	VLAN ID			
Storage	Q VM Network		0	0			
🔹 💇 Networking 📃 🚺	Management Network		1	0			
▼ Q ISCSI_for_VMs	SCSI_VMKernel		1	0			
Monitor More networks	Add port group - ISCSI_for_VMs						
	Name	ISCSI_for_VMs					
	VLAN ID	0					
	Virtual switch	vSwitch1	•				
	▶ Security	Click to expand					
				Add Cancel			

4. Repeat steps 1-3 for any other links intended for Synchronization and iSCSI/Heartbeat traffic on ESXi hosts.

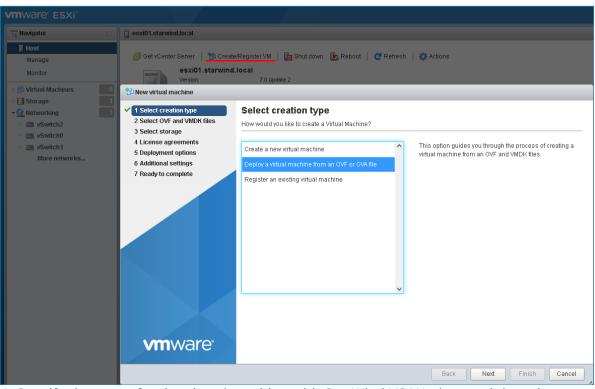
Deploying Starwind Virtual San For Vsphere

1. Download zip archive that contains StarWind Virtual SAN for vSphere: https://www.starwindsoftware.com/starwind-virtual-san#download

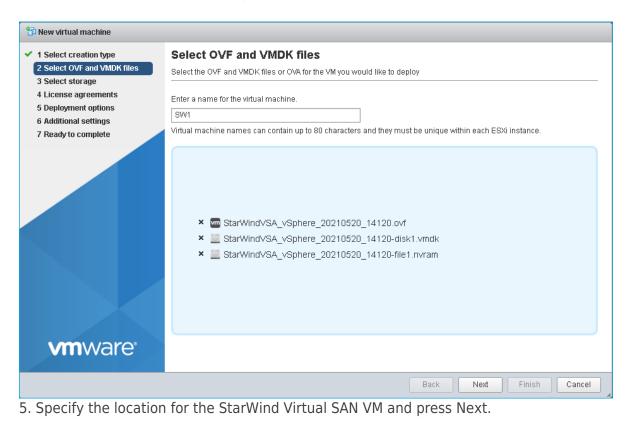
2. Extract virtual machine files from the downloaded archive.

3. Deploy a virtual machine on each ESXi host using the "Create/Register VM" button. Select "Deploy a virtual machine from an OVF or OVA file" in the Select creation type section and press Next.





4. Specify the name for the virtual machine with StarWind VSAN, drag and drop the extracted files to the wizard, and press Next.



StarWind Virtual SAN: Configuration Guide for VMware vSphere [ESXi], VSAN Deployed as a Controller VM using PowerShell CLI



Select creation type	Select storage								
Select OVF and VMDK files	Select the storage type and datas	store							
Select storage		51016							
License agreements	Standard Persistent Memo	10							
5 Deployment options	Persistent Mento	ЛУ							
i Additional settings	Select a datastore for the virtual	I machine's d	onfiguration fil	es and all of it:	s' virtual dis	ks.			
⁷ Ready to complete	1								
	Name	~	Capacity 🗸	Free ~	Туре	~	Thin pro \checkmark	Access	\sim
	datastore1		49.75 GB	48.34 GB	VMFS6		Supported	Single	
								1 ii	tems
								1 ii	tems
								1 ir	tems
								1 ii	tems
								1 i	tems
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vm ware [•]								1 ii	tems

6. Read and accept the license agreements by pressing on "I agree" button. Press Next to continue.

1 Select creation type	Liconso agroomonto
7 Select Creation type 2 Select OVF and VMDK files 3 Select storage	License agreements Read and accept the license agreements
Deployment options	An end-user licens
i Ready to complete	STARWIND LICENSE AGREEMENT FOR COMMERCIAL PRODUCTS This StarWind License Agreement (the "Agreement") is a legal agreement between the entity indicated on th
	Licensee is subject to the terms and conditions of this Agreement whether Licensee accesses or obtains St THIS DOCUMENT, UNTIL CONFIRMED BY STARWIND, CONSTITUTES AN OFFER BY LICENSEE, AND LICENSEE, BY EXECUTING IF EXECUTE DELECTRONICALLY, LICENSEE WILL HAVE THE OPPORTUNITY TO ACCEPT THIS OFFER OF AGREEMENT THROUGH STARWIND MAY, IN ADDITION TO ELECTRONIC OR PHYSICAL EXECUTION OF THIS AGREEMENT, APPROVE THIS DOCUMENT AN 1. Definitions. Each of the expressions indicated below will have, in this agreement, the meaning assigned to it, namely: 1.1. "Affiliate" shall mean, with respect to a given Person, any person or entity which, directly or indi 1.2. "Appliance" shall mean any and all starWind hardware which may include a software component as liste 1.3. "ASW" shall mean the terms and details of StarWind Annual Support and Maintenance located at https:/ 1.4. "Configuration Certificate" shall mean any information, product, document or other material of any na 1.5. "Configuration Standards" shall have the meaning set forth in Section 3.8(d).
	1.7. "Documentation" shall mean user manuals, training materials, product descriptions and specifications 1.8. "Intellectual Property Rights" shall mean all forms of intellectual property rights and protections a). All right, title and interest in and to all patents and all filed, pending, or potential applications b). All right, title and interest in and to all trade secrets and all trade secret rights and equivalent c). All right, title and interest in and to all mask works, copyrights, other literary property or author authors and the all means and to all mask works. Copyrights of design trademarks."
vm ware [®]	l agree
	Back Next Finish Can



🔁 New virtual machine - SW1		
 1 Select creation type 2 Select OVF and VMDK files 3 Select storage 	Deployment options Select deployment options	
 4 License agreements 5 Deployment options 6 Ready to complete 	Network mappings	Management VM Network ISCSI ISCSI_for_VMs Sync SYNC_for_VMs
	Disk provisioning	O Thin O Thick
	Power on automatically	
vm ware [*]		
		Back Next Finish Cancel

8. Review the settings and click Finish to start the deployment process.

🔁 New virtual machine - SW1				
 1 Select creation type 2 Select OVF and VMDK files 3 Select storage 	Ready to complete Review your settings selection before fil	nishing the wizard		
4 License agreements5 Deployment options	Product	Star/WindVSA_vSphere_20210520_14120		
6 Ready to complete	VM Name Files	SW1 StarWindVSA_vSphere_20210520_14120-disk1.vmdk		
	Datastore	Star/WindVSA_vSphere_20210520_14120-file1.nvram		
	Provisioning type	oatastore1 Thick		
	Network mappings	Management: VM Network, iSCSI: ISCSI_for_VMs,Sync: SYNC_for_VMs		
	Guest OS Name	Red Hat Enterprise Linux 7 (64-bit)		
	Do not refresh your brow	/ser while this VM is being deployed.		
vm ware [®]				
		Back Next Finish Cancel		

12. Repeat all the steps from this section on the other ESXi hosts.

NOTE: In some cases, it's recommended to reserve memory for StarWind VSAN VM.

NOTE: When using StarWind with the synchronous replication feature inside of a Virtual Machine, it is recommended not to make backups and/or snapshots of the Virtual Machine with the StarWind VSAN service installed, as this could pause the StarWind Virtual Machine. Pausing the Virtual Machines while the StarWind VSAN service in under load may lead to split-brain issues in synchronous replication devices, thus to data corruption.

Configuring Starwind Vms Startup/shutdown

1. Setup the VMs startup policy on both ESXi hosts from Manage -> System tab in the ESXi web console. In the appeared window, check Yes to enable the option and choose the stop action as Shut down. Click Save to proceed.

VMWare' ESXi~			
🕒 Navigator	esxi01.starwind.local - Manage		
→ 📳 Host Manage	System Hardware Licens	ing Packages Services	Security & users
Monitor	Advanced settings	🥒 Edit settings	
Virtual Machines		Enabled	No
 ► Storage ▲ Q Networking 	Time & date	🥖 Change autostart configuration	
 Switch2 Switch0 		Enabled	● Yes O No
More networks		Start delay	120 🗘 seconds
		Stop delay	120 🗘 seconds
		Stop action	Shut down ~
		Wait for heartbeat	🔿 Yes 💿 No
			Save Cancel

2. To configure a VM autostart, right-click on the VM, navigate to Autostart and click Enable.



vm ware [®] ESXi [™]				root@
📲 Navigator 🛛	esxi01.starwind.local - Manage		🔂 SW1	
→ 🗄 Host Manage	System Hardware Lice	nsing Packages	Power Guest OS	
Monitor	Advanced settings Autostart	Edit settings Enabled	i Snapshots	>
Image: Storage 1	Swap Time & date	Start delay	Console	→
 ✓ Q Networking → □ vSwitch2 		Stop delay	🙀 Vpgrade VM Compatibility	P
vSwitch0 More networks		Stop action	🤹 Export	
		Wait for heartbea	😼 Edit settings	🕴 🖸 Refresh 🏠 Actions
		Virtual machine	♣ Permissions	
		🚯 SW1	🔊 Rename	s
		Quick filters	😰 Answer question 뒘 Unregister	
			B Delete	_
	🕄 Recent tasks		 Help Open in a new window 	

- 3. Complete the actions above on StarWind VM located on all ESXi hosts.
- 4. Start the virtual machines on all ESXi hosts.

Configuring Starwind Virtual San Vm Settings

By default, the StarWind Virtual SAN virtual machine receives an IP address automatically via DHCP. It is recommended to create a DHCP reservation and set a static IP address for this VM. In order to access StarWind Virtual SAN VM from the local network, the virtual machine must have access to the network. In case there is no DHCP server, the connection to the VM can be established using the VMware console and static IP address can be configured manually.

1. Open a web browser and enter the IP address of the VM, which it had received via DHCP (or had it assigned manually), and log in to StarWind Virtual SAN for vSphere using the following default credentials:

Username: user Password: rds123RDS NOTE: Make sure to tick Reuse my password for privileged tasks check box.



C ▲ Not secure 192.168.12.227:909/users#/user	
≋ StarWind	
Chevel All and A	
StarWind Virtual SAN	
User name user Server: starwindvsa-84697911	
Log in with your server user account.	
Password	
Log In	
	1

- 2. After the successful login, on the left sidebar, click Accounts.
- 3. Select a user and click Set Password.



≈ Accounts - starwindvsa-84	69791 × +			0	-		×
← → C ▲ Not see	cure 192.168.12.	227:9090/users#/user			☆		:
STARWIND VIRTUAL SAN						💄 us	ier 🗸
starwindvsa-84	Accounts > user	Set Password			1		
System	user	Old Password			ssion	Delet	e
Logs	Full Name	New Password					
Storage	User Name u	Confirm New Password					
Networking	Roles						
Accounts	Last Login N			Cancel Set			
Services	Access	Lock Account	Never lock account				
Terminal	Password	Set Password Force Chang	ge Never expire password				
	Authorized Pub	lic SSH Keys				4	
		lic SSH Keys uthorized public keys for this	account.			•	
			account.				
			account.			4	
			account.				
			account.				
			account.			•	

4. On the left sidebar, click Networking.



≈ Networking - starwindvsa-84	4697° × +			• - □ ×
← → C ▲ Not secu	are 192.168.12.227:9090/	network		☆ 😩 :
STARWIND VIRTUAL SAN				🔓 Privileged 💄 user 🗸
starwindvsa-84	Kbps Sending		Kbps Receiving	A
System	400		400	
Logs	0		0	
Storage	03:48 03:49	03:50 03:51 03:52	03:48 03:49	03:50 03:51 03:52
Networking	Firewall			0
Accounts	0 Active Rules			
Services				
Terminal	Interfaces		Add Bond Ad	dd Team Add Bridge Add VLAN
renninai	Name	IP Address	Sending	Receiving
	ens192	192.168.12.227/23	5.40 Kbps	4.60 Kbps
	ens224		Inactive	
	ens256		Inactive	
	Networking Logs			•

Here, the Management IP address of the StarWind Virtual SAN Virtual Machine, as well as IP addresses for iSCSI and Synchronization networks can be configured.

In case the Network interface is inactive, click on the interface, turn it on, and set it to "Connect automatically".



	84697 × +	• - •	×
\leftrightarrow \rightarrow C \blacktriangle Not set	cure 192.168.12.227:9090/network#/ens224	* 2	:
STARWIND VIRTUAL SAN		🔓 Privileged 💄 use	r 🗸
starwindvsa-84	Networking > ens224		
System		Kbps Receiving	_
Logs		400	_
Storage	o	0	
Networking	04:24 04:25 04:26 04:27 04:28	04:24 04:25 04:26 04:27 04:28	
Accounts	ens224 VMware VMXNET3 Ethernet Controller vmxnet3 00:0C:29:A6:D	D6:F6	
Services	Status Inactive		
Terminal	Carrier 10 Gbps General Connect automatically IPv4 Automatic (DHCP) IPv6 Automatic MTU Automatic		

5. Click on Automatic (DHCP) to set the IP address (DNS and gateway – for Management).

Networking - starwindvsa	-846976 × +			• - • ×
← → C ▲ Not se	ecure 192.168.12.227:9090/network#/	ens224		☆ 😩 :
STARWIND VIRTUAL SAN				🔒 Privileged 💄 user 🗸
starwindvsa-84	Networking > ens224	IPv4 Settings	_	
System	Kbps Sending 800	Addresses	Manual ~ +	
Logs	400	172.16.10.10 255.255.255.0	Ga Automatic (DHCP)	
Storage	0	DNS	Manual	
Networking	05:57 05:58	DIVS	Shared + Disabled	06:00 06:01
Accounts	ens224 VMware VMXNET3 Etherne	DNS Search Domains	Automatic +	
Services	Status Configuring IP			
Terminal	Carrier 10 Gbps General 🔽 Connect automatically	Routes	Automatic 🗸 +	
	General Connect automatically IPv4 Automatic (DHCP) IPv6 Automatic MTU Automatic		Cancel Apply	

6. The result should look like on the picture below:



≈ Networking - starwindvsa-	-846979 × +			•
\leftrightarrow \rightarrow C \blacktriangle Not se	cure 192.168.12.10:9090/networ	k		\$
TARWIND VIRTUAL SAN				🔒 Privileged 💄 use
starwindvsa-84	Kbps Sending		Kbps Receiving	
System Logs	400		400	
 Storage	0 06:02 06:03	06:04 06:05 06:06	0 06:02 06:03	06:04 06:05 06:06
Networking	Firewall			
Accounts	0 Active Rules			
Services				
Terminal	Interfaces			Add Bond Add Team Add Bridge Add VLAN
	Name	IP Address	Sending	Receiving
	ens192	192.168.12.10/24	8.74 Kbps	7.54 Kbps
	ens224	172.16.10.10/24	0 bps	0 bps
	ens256	172.16.20.10/24	0 bps	0 bps
	Networking Logs			

NOTE: It is recommended to set MTU to 9000 on interfaces, dedicated for iSCSI and Synchronization traffic. Change Automatic to 9000, if required.

≈ Networking - sw1	× +	• [–]	
\leftarrow \rightarrow C S https:/	//192.168.12.10:9090/network#/ens224		. :
STARWIND VIRTUAL SAN		🔓 Privileged	🛓 user 🗸
🗐 sw1	Networking > ens224		
System	Kbps Sending Kbps Receiving		
Logs	400 400		
Storage			
Networking	18:44 18:45 18:46 18:47 18:48 18:44 18:45	18:46 18:47	18:48
Accounts	ens224 VMware VMXNET3 Ethernet Controller vmxnet3 00:0C:29:A6:D6:F6		
Services	Status 172.16.10.10/24		
Terminal	Carrier 10 Gbps General Connect automatically		
	IPv4 Address 172.16.10.10/24 IPv6 Automatic		
	MTU 9000		

6. Alternatively, log in to the VM via the VMware console and assign a static IP address by editing the configuration file of the interface located by the following path: /etc/sysconfig/network-scripts



📓 SW1	🖬 🖬 🔤 🍪 Actions ⊗
Meb console: https://starwindvsa-84697911:9090/ or https://192.168.12.227:9090/	
<pre>starwindvsa-84697911 login: Password: Last login: Tue Aug 12 04:43:59 on ttu1 Iuser@starwindvsa-84697911 ~ 15 is zetc/sysconfig/network-scripts/ Ifclg-ens122 ifdown ifdown-ippp ifdown-ppp ifdown-transfer ifup-th ifup-tion ifup-pps ifup-Team init.ipv6-global ifcfg-ens225 ifdown-beep ifdown-ipv ifdown-tutts ifdown-tunnel ifup-th ifup-tion ifup-pps ifup-TeamPort network-functions ifcfg-ens256 ifdown-eth ifdown-isdw ifdown-team ifup- aliases ifup-ippp ifup-plusb ifup-sit ifup-wireless Iuser@starwindvsa-84697911 ~ 3; foronfig ens192: flags=4163</pre> UP_BROADCAST, RUNNING, MULTICAST> mtu 1500 inet 192. 160.12.227 netwask 255.255.254.0 broadcast 192.168.13.255 ether 00:80:23:46:163:etx	iµv6
RX packets 3057 bytes 277047 (271.3 KiB) RX errors 0 dropped 0 overruns 0 frame 0 TX packets 1067 bytes 1554056 (1.4 MiB) TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0 device interrupt 19 memory 0xfd3a0000-fd3c0000	
ems224: flags=41634UP.BR60bCAST.RUNNING.MULTICAST> mtu 1500 ether 80:80:229:a6:46:f6 txqueuelen 100000 (Ethernet) RK packets 2 bytes 120 (120.0 B) RX errors 0 dropped 0 overruns 0 frame 0 TX packets 0 bytes 0 (0.0 B) TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0	
ens256: flags=4163 <up,broadcast,running,multicast> mtu 1500 ether 00:8c:23:a6:46:00 txqueuelen 10000 (Ethernet) RX packets 2 bytes 120 (122.0.8 B) RX errors 0 dropped 0 overruns 0 frame 0 TX packets 0 bytes 0 (0.8 B) TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0</up,broadcast,running,multicast>	
lo: flags=73(UP,LOOPBACK,RUNNING> mtu 65536 inet 127.0.0.1 netmask 255.0.0.0 loop tsqueuelen 1000 (Local Loopback) RX packets 172 bytes 147586 (144.1 KiB) RX errors 0 dropped 0 overruns 0 frame 0 TX packets 172 bytes 147586 (144.1 KiB) TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0	
Euser@starwindvsa-84697911 ~1\$ sudo nano /etc/sysconfig/network-scripts/ifcfg-ens192	.at.

7. Open the file, corresponding to the Management interface using text editor, for example:

sudo nano /etc/sysconfig/network-scripts/ifcfg-ens192

8. Edit the file:

Change the line BOOTPROTO=dhcp to: BOOTPROTO=static

Add the IP settings needed to the file: IPADDR=192.168.12.10 NETMASK=255.255.255.0 GATEWAY=192.168.12.1 DNS1=192.168.1.1 By default, the Management link should have an ens192 interface name. The configuration file should look as follows



SW1					🖓 🖾 🚍 🏧 Actions 🛞
GNU nano 2.3.1	Fil	le: /etc/sysconfig/network-s	cripts/ifcfg-ens192		Modified
TYPE=Ethernet					
PROXY_METHOD=none					
BROWSER_ONLY=no					
BOOTPROTO=static DEFROUTE=yes					
IPV4_FAILURE_FATAL=no					
IPV6INIT=ues					
IPV6_AUTOCONF=yes					
IPV6_DEFROUTE=yes IPV6_FAILURE_FATAL=no					
IPV6_FAILURE_FAIAL=no IPV6_ADDR_GEN_MODE=stable					
NAME=ens192	. privacy				
UUID=bcf81314-50a7-4bc3-a	13ba-76e317a7bd1e				
DEVICE=ens192					
ONBOOT=yes IPV6_PRIVACY=no					
IPADDR=192.168.12.10					
NETMASK=255.255.255.0					
GATEWAY=192.168.12.1					
DNS1=192.168.1.1					
°G Get Help	🔟 WriteOut	R Read File	🍟 Prev Page	🖹 Cut Text	C Cur Pos
^X Exit	^J Justify	<mark>^W</mark> Where Is	^Ų Next Page	<mark>^U</mark> UnCut Text	To Spell 🔐

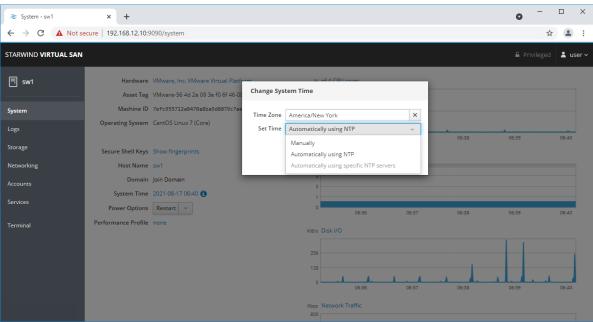
9. Restart interface using the following cmdlet: sudo ifdown ens192, sudo ifup ens192 or restart the VM.

10. Change the Host Name from the System tab by clicking on it

System - starwindvsa-846	97911 × +								0	- 0	×
\leftrightarrow \rightarrow C \blacktriangle Not set	ecure 192.168.12.10:9	0090/system								\$:
STARWIND VIRTUAL SAN									🔓 Priv	vileged 💄 us	ser ~
starwindvsa-84		VMware, Inc. VM VMware-56 4d 2	Change Host Nam	e	94 - DE A C	DILCORE					
System	Machine ID	7efc955712a847	Pretty Host Name	sw1							
Logs	Operating System	CentOS Linux 7 (Real Host Name								
Storage	Secure Shell Keys	Show fingerprin							06:08	06:09	
Networking		starwindvsa-846									
Accounts		Join Domain 2021-08-17 06:0					Cancel	Change			
Services	Power Options		_		0	06:05	06:06	06:07	06:08	06:09	
Terminal	Performance Profile	none			KiB/s Disk I		UE:UE	06:07	06:08	08:09	
					96 64 32 0	06:05	06:06	06:07	06:08	06:09	
11 Channed				:6	Kbps Netw	ork Traffic					

11. Change System time and NTP settings if required





12. Repeat the steps above on each StarWind VSAN VM.

Configuring Starwind Management Console

1. Install StarWind Management Console on a workstation with Windows OS (Windows 7 or higher, Windows Server 2008 R2 and higher) using the installator available here. NOTE: StarWind Management Console and PowerShell Management Library components are required.

Select the appropriate option to apply the StarWind License key.
 Once the appropriate license key has been received, it should be applied to StarWind Virtual SAN service via Management Console or PowerShell.

3. Open StarWind Management Console and click Add Server.



StarWind Management Console		-	×
FILE HOST TARGET OPTIONS HELP			
Refresh Connect Disconnect Add Server Remove Server Add Device Add Device (advanced) Add VTL Device Remove Target	? Help		
Servers			
Add Server This Option allows you to add local or remote StarWind Server Hosts to StarWind Management Console			
(>
StarWind Software Ready			

4. Type the IP address of the StarWind Virtual SAN in the pop-up window and click OK.

📑 Ad	d new StarWind Server		?	×
Host:	192. 168. 12. 10		: 3261	
Adva	anced >>	ОК	Cano	el

- 5. Select the server and click Connect.
- 6. Click Apply Key... on the pop-up window.



StarWind Manag	jement Console
IF FF 00 BF 4D A3 EE D CCT	StarWind Server Activation
	Apply License Key, could be Time-limited Trial Key, free Version Key or Commercial License Key delivered with Purchase
	Request free Version Key <u>Here</u> .
	· · · · · · · · · · · · · · · · · · ·
	Close 🍼 Apply Key

7. Select Load license from file and click the Load button.

8. Select the appropriate license key.

As an alternative, PowerShell can be used. Open StarWind InstallLicense.ps1 script with PowerShell ISE as administrator. It can be found here:

C:\Program Files\StarWind

Software\StarWind\StarWindX\Samples\powershell\InstallLicense.ps1

Type the IP address of StarWind Virtual SAN VM and credentials of StarWind Virtual SAN service (defaults login: root, password: starwind).

Add the path to the license key.



Administrator: Windows PowerShell ISE – 🗆	×
File Edit View Tools Debug Add-ons Help	
InstallLicense.ps1 X	
1 #	~
2 # The following example shows how to apply license on a server 3 #	
4 Import-Module StarWindX	
5 6 Enable-SWXLog	
7 8 Sserver = New-SWServer -host 127.0.0.1 -port 3261 -user root -password starwind	
9	
10 try 11 ⊡{	
12 \$server.Connect() 13	
14 Get-SWLicense Sserver	
15 16 Remove-SWLicense \$server	
17 18 #apply license key	
19 Set-SwLicense \$server "C:\License\licensekey.swk"	
20 } 21 catch	
22 ⊡{ 23 Write-Host \$foreground red	
24 }	
25 [°] finally 26 ⊡{	
27 \$server.Disconnect() 28 }	
20 L3 29	
	~
PS C:\Program Files\StarWind Software\StarWind\StarWindX\Samples\powershell>	
<	>
Ln 1 Col 1	100%

9. After the license key is applied, StarWind devices can be created. NOTE: In order to manage StarWind Virtual SAN service (e.g. create ImageFile devices, VTL devices, etc.), StarWind Management Console can be used.

Configuring Storage

StarWind Virtual SAN for vSphere can work on top of Hardware RAID or Linux Software RAID (MDADM) inside of the Virtual Machine. Please select the required option:

Configuring Starwind Storage On Top Of Hardware Raid

1. Add a new virtual disk to the StarWind Virtual SAN VM by editing its settings. Make sure it is Thick Provisioned Eager Zeroed. Virtual Disk should be located on the datastore provided by hardware RAID.



🗗 Edit settings - SW1 (ESXi 5.5 virtual m	nachine)	
Virtual Hardware VM Options		
🔜 Add hard disk 🛛 🎫 Add network ada	apter 🛛 🚍 Add other device	
> 🗖 CPU	4 ~ ()	
Memory	4 GB ~	
▶ 🛄 Hard disk 1	16 GB ~	E.
▼ 🛄 New Hard disk	20 GB ~	
Maximum Size	41.75 GB	
Location	[datastore1] SW1/ Browse	
Disk Provisioning	 Thin provisioned Thick provisioned, lazily zeroed Thick provisioned, eagerly zeroed 	
Shares	Normal ~ 1000 ~	
Limit - IOPs	Unlimited ~	
Controller location	SCSI controller 0 v SCSI (0:1) v	
Disk mode	Dependent ~	
Sharing	None ~	
SCSI Controller 0	LSI Logic SAS 🗸	
SATA Controller 0	8	
	Save	ancel

NOTE: Alternatively, the disk can be added to StarWind VSAN VM as RDM. The link to VMware documentation is below:

https://docs.vmware.com/en/VMware-vSphere/7.0/com.vmware.vsphere.vm_admin.doc/G UID-4236E44E-E11F-4EDD-8CC0-12BA664BB811.html

NOTE: If a separate RAID controller is available, it can be used as dedicated storage for StarWind VM, and RAID controller can be added to StarWind VM as a PCI device. In this case RAID volume will be available as a virtual disk in the Drives section in the Web console. Follow the instructions in the section below on how to add RAID controller as PCI device to StarWind VM.

2. Login to StarWind VSAN VM web console and find in the Storage section under Drives



 \times ≈ Storage - sw1 × + a ← → C S https://192.168.12.10:9090/storage . : STARWIND VIRTUAL SAN 💄 user 💊 🗐 sw1 RAID Devices KiB/s Reading KiB/s Writing 96 96 No storage set up as RAID 64 64 32 32 + Volume Groups 0 0 10:58 11:01 10:58 10:59 11:00 10:59 11:00 Storage centos 15.0 GiB Filesystems Networking + VDO Devices Name Mount Point Size Accounts No storage set up as VDO 2.78 / 13.4 GiB /dev/centos/root /dev/sda1 /boot 158 / 1014 MiB Drives VMware Virtual disk 9 Storage Logs 16 GiB Hard Disk R: 0 B/s W: 0 B/s August 17, 2021 VMware Virtual SATA CD... 07:07 g_object_notify: object class 'UDisksLinuxBlockO... udisksd ß Optical Drive 07:07 g_object_notify: object class 'UDisksLinuxBlockO... udisksd 2 🕨 R: 0 B/s W: 0 B/s 07:07 g_object_notify: object class 'UDisksLinuxLogica... udisksd 2 🕨 VMware Virtual disk 07:07 g_object_notify: object class 'UDisksLinuxVolume... udisksd ß 20 GiB Hard Disk 07:07 g_object_notify: object class 'UDisksObjectSkele... udisksd R: 0 B/s W: 0 B/s 07:07 g_object_notify: object class 'UDisksObjectSkele... udisksd

the Virtual Disk that was recently added and choose it.

3. The added disk does not have any partitions and filesystem. Press Create partition table and press Format afterward to create the partition and format it.

NOTE: It is not necessary to overwrite data while creating partition.

Storage - sw1	× +		o –				
\leftarrow \rightarrow C O https://	192.168.12.10:9090/storage#/sdb			. :			
STARWIND VIRTUAL SAN	STARWIND VIRTUAL SAN						
🗏 sw1	Storage > VMware Virtual disk						
System	Drive						
Logs	Model Virtual disk Firmware Version 1.0						
Storage	Capacity 20 GiB, 21.5 GB, 21474836480 bytes						
Networking	Device File /dev/sdb						
Accounts							
Services	Content		Create Partitio	n Table			
Terminal	✓ 20 GiB Unrecognized Data	/dev/sdb					
	Unrecognized Data			Format			
	Usage -						
	Туре -						

4. Create the XFS partition. Specify the name and erase option. The mount point should be as following: /mnt/%yourdiskname% . Click Format. To enable OS boot when mount



point is missing (e.g., hardware failure), add nofail as a boot option.

Storage - sw1	× +			• -	
\leftarrow \rightarrow C S https:/	//192.168.12.10:9090/storage#/sdb				1 :
STARWIND VIRTUAL SAN					💄 user 🗸
🗐 sw1	Storage > VMware Virtual disk	Format /dev/sdb			
System Logs	Drive Model Virtual disk Firmware Version 1.0		Overwrite existing data with zeros v (FS - Recommended default v		
Storage Networking	Capacity 20 GiB, 21.5 Device File /dev/sdb		lisk1 Encrypt data		
Accounts		Mount Point /	vustom v mnt/disk1		
Services	Content	Mount Options 🔽	Mount at boot Mount read only	Create Partitio	n Table
Terminal	20 GIB Unrecognized Data Unrecognized Data Usage - Type -		Custom mount options Formatting a storage device will erase all data on it. Cancel Format		Format

5. On the storage page of the disk, navigate to the Filesystem tab. Click Mount.

≋ Storage - sw1	× +	• - •	×
\leftrightarrow \rightarrow C \odot https://	/192.168.12.10:9090/storage#/sdb		:
STARWIND VIRTUAL SAN		🔒 Privileged 💄 ι	user 🗸
🗐 sw1	Storage → VMware Virtual disk		
System	Drive		
Logs	Model Virtual disk Firmware Version 1.0		
Storage	Capacity 20 GiB, 21.5 GB, 21474836480 bytes		
Networking	Device File /dev/sdb		
Accounts			
Services	Content	Create Partition Table	e
Terminal	✓ 20 GiB xfs File System //dev/sdb		
	Filesystem	Forma	it
	Name disk Mount Point /mnt/disk1 Mount Mount Options <u>defaults</u> Used -		

6. Using StarWind Management Console, connect to StarWind Virtual SAN VM and configure storage pool (default storage for StarWind devices) by clicking Yes.



StarWind Management Console	×	
Storage pool is not configured! Would you like to configure it?		
Yes	Disconnect	7. Select the disk which

recently mounted.

💿 Open				×
👔 Back 🔑 New Folder 🖊 Delete				
VSA Storage media	Name	Size	Date 05/10/2019 07:24	Attributes
File name:			×	
				Open Cancel

Configuring Starwind Storage On Top Of Software Raid

Make sure that the prerequisites for deploying Software RAID with StarWind Virtual SAN are met:

- The ESXi hosts have all the drives connected through HBA or RAID controller in HBA mode
- StarWind Virtual SAN for vSphere VM is deployed on the ESXi server and turned off
- StarWind Virtual SAN VM is installed on a separate storage device available to the ESXi host (e.g. SSD, HDD etc.)
- HBA or RAID controller can be added via a DirectPath I/O passthrough device to a StarWind Virtual SAN VM without affecting ESXi host work

PCI Device Configuration



1. Login to the ESXi host where StarWind Virtual SAN VM is installed.

2. In the Navigator, go to Manage, and in the Hardware tab, select PCI Devices.

3. Locate the HBA/RAID Controller of the ESXi host. Check the box on the appropriate PCI device. Click Toggle passthrough.

	+						•	>	- 0	>
→ C ▲ Not secure 1	92.168.12.225/	ui/#/host/ma	anage/hardw	are/pci-devi	es				\$	
n ware' esxi"					root@192.16	68.12.225 -	Help 🚽	Q Sear	ch	
Navigator	esxi01.star	wind.local - M	anage							
Host	System	Hardware	Licensing	Package	Services Security & users					
Manage Monitor	PCI Device Power Mar		\$	Toggle passth	rough 🥒 Configure SR-IOV 🥒 Hardw	are label 🛛 🖹 R	eboot host	-	fresh)
✓ ∰ SW1				Address 🗸	Description	✓ SR-I	OV 🗸 Passt		Hardw 🗸	
Monitor				000:00	Intel Corporation Virtual Machine Chipset	Not	cap Not ca	ap		0
More VMs				000:00	Intel Corporation 440BX/ZX/DX - 82443BX	VZX/D Not of	cap Not ca	ap		
Storage 1 Storage 3				0000:00	Intel Corporation Virtual Machine Chipset	Not	cap Not ca	ap		h
			Q	uick filters	~				42 items	
	Recent task									

- 4. Restart ESXi host to make PCI device available to VMs.
- 5. Right-click on the StarWind Virtual SAN VM to Edit Settings.
- 7. Click ADD NEW DEVICE. Select PCI Device.



📃 Add hard disk 🛛 🛤 Add netwo	rk adapter	🚍 Add other device		
CPU	1	 CD/DVD drive Floppy drive 		
Memory	102	-		
🔚 Hard disk 1	16	🖻 Parallel port		6
SCSI Controller 0	LSI	USB controller	▼	(
SATA Controller 0		Sound controller		
USB controller 1	US	PCI device	¥	
Network Adapter 1	VM		▼ Connect	
S CD/DVD Drive 1	Ho	SATA controller	Connect	

8. Add HBA/RAID Controller to the VM. Reserve memory for the StarWind Virtual Machine. Click OK.

9. Boot StarWind Virtual SAN VM.

10. Repeat steps 1-8 for all hosts where StarWind Virtual SAN for vSphere is deployed.

 Login to StarWind Virtual SAN VM via IP. The default credentials: Login: user
 Password: rds123RDS
 NOTE: Please make sure that the default password is changed.



≈ sw1	× +		• - • ×
\leftrightarrow \rightarrow C \odot h	https://192.168.12.10:9090/		. :
StarW	ind Virtual SAN	and a second sec	Star Wind
User name	user	Server: sw1	1 and 1
Password		Log in with your server user account.	
	Reuse my password for privileged tasks		
		Log In	

12. Go to the Storage page. The Drives section shows the drives connected to HBA/RAID Controller (if available). For each disk, create partition table.

≋ Storage - sw1	× +	•	
\leftrightarrow \rightarrow C O https:	://192.168.12.10:9090/storage		. :
STARWIND VIRTUAL SAN		🔓 Privileged	💄 user 🗸
🗐 sw1	KIB/s Reading KIB/s Writing	RAID Devices	• Î
System	64 64	No storage set up as RAID	- 1
Logs	32 32	Volume Groups	•
Storage	10:58 10:59 11:00 11:01 11:02 10:58 10:59 11:00 11:01 11:02	centos 15.0 G/B	
Networking	Filesystems		
Accounts	Name Mount Point Size	VDO Devices	•
Services	/dev/centos/root / 2.78 / 13.4 GiB	No storage set up as VDO	
Terminal	/dev/sda1 /boot 158 / 1014 MiB	Drives	
	Storage Logs August 17, 2021	VMware Virtual disk 16 GiB Hard Disk R: 0 B/s W: 0 B/s	
	07:07 g_object_notify: object class 'UDisksLinuxBlockO udisksd	VMware Virtual SATA CD	- 1
	07:07 g_object_notify: object_class 'UDisksLinuxBlockO_ udisksd 21	Optical Drive R: 0 B/s W: 0 B/s	
	07:07 g_object_notify: object class 'UDisksLinuxLogica udisksd 2>		- 1
	07:07 g_object_notify: object class 'UDisksLinuxVolume udisksd 07:07 g_object_notify: object class 'UDisksObjectSkele udisksd	20 GiB Hard Disk	
	07:07 g_object_notify: object class 'UDisksObjectSkele udisksd	R: 0 B/s W: 0 B/s	

13. Click "+" in the RAID Devices section to create Software RAID. (In the current example, RAID 10 will be created with 4 HDD drives). The RAID configuration depends on the number of disks, chunk size, and array level are shown in the table below:



RAID Level	Chunk size for HDD Arrays	Chunk size for SSD Arrays
0	Disk quantity * 4Kb	Disk quantity * 8Kb
5	(Disk quantity – 1) * 4Kb	(Disk quantity - 1) * 8Kb
6	(Disk quantity – 2) * 4Kb	(Disk quantity – 2) * 8Kb
10	(Disk quantity * 4Kb)/2	(Disk quantity * 8Kb)/2
 <i>c</i> . 	• I I III	

StarWind Software RAID recommended settings can be found here: https://knowledgebase.starwindsoftware.com/guidance/recommended-raid-settings-for-h dd-and-ssd-disks/

14. Select the drives to add to the array.

Storage - StarWindVSA-92154	428: × +			-		×
\leftrightarrow \rightarrow C \square https://19	92.168.12.10:9	090/system	☆			:
STARWIND VIRTUAL SAN			🔒 Privi		-	root ~
StarWindVSA-92	Create RAID	Device				
System Logs Storage	Name RAID Level Chunk Size Disks	RAID10 RAID 10 (Stripe of Mirrors) 512 KiB I 6 GIB DELL PERC H710F		/de	v v	
Networking Accounts		 I6 GIB DELL PERC H710F I6 GIB DELL PERC H710F 			v/sdd v/sde	
Services Terminal		I6 GiB DELL PERC H710F		/de	ev/sdf	
		No storage set up as VDO	Cancel	С	reate	
		/Mware Virtual disk 6 GiB Hard Disk R: 0 B/s W: 0 B/s				

15. After the synchronization is finished, find the RAID array created. Press Create partition table and press Format afterward to create the partition and format it.

NOTE: It is not necessary to overwrite data while creating a partition.



Storage - StarWindVSA-921	5428° × +	-	
\leftrightarrow \rightarrow C $$ https://	192.168.12.10:9090/system	☆	:
STARWIND VIRTUAL SAN		Privileged	💄 root 🗸
StarWindVSA-92	Storage » RAID10		A
System	RAID Device RAID10	Stop De	lete
Logs	Device /dev/md/RAID10		
Storage	UUID fd81b6ab:31d1c828:1f0cbefb:a84290b3		
Networking	Capacity 32.0 GiB, 34.3 GB, 34324086784 bytes RAID Level RAID 10, 4 Disks, 512 KiB Chunk Size		
Accounts	Bitmap ON		
Services	State Running		
Terminal			
			-

16. Create the XFS partition. Mount point should be as follows: /mnt/%yourdiskname% . Select the Custom mounting option and type noatime. To enable OS boot when mount point is missing (e.g., hardware failure), add *nofail* as a boot option. Click Format.



≈ Storage - StarWindVSA-921	5428: × +		-		×
← → C			\$:
STARWIND VIRTUAL SAN			🔓 Privileged	*	root ~
StarWindVSA-92	Format /dev/m	d/RAID10			1
System	Erase Type	Don't overwrite existing data XFS - Red Hat Enterprise Linux 7 default		* *	
Logs	Name	raid10			
Storage	Mounting	Custom		~	
Networking	Mount Point	mnt/raid10			
Accounts Services		Mount at boot Mount read only Custom mount options noatime			
Terminal		Formatting a storage device		ata on i ormat	t.
	Unrecognized I Usage - Type -	Data	F	ormat]

17. On the storage page of the disk, navigate to the Filesystem tab. Click Mount.



Storage - StarWindVSA-921	5428: × +	-		×
\leftrightarrow \rightarrow C $$ https://	192.168.12.10:9090/system	☆		:
STARWIND VIRTUAL SAN		🔓 Privileged	å r	oot ~
StarWindVSA-92	Content	Create partition	table	•
System	✓ 32.0 GiB xfs File System /dev/md/RAID10			
Logs	Filesystem			-
Storage	Name raid10	F	ormat	
Networking	Mount Point mnt/raid10 Mount			
Accounts	Mount Options noatime Used -			
Services				
Terminal				~

18. Connect to StarWind Virtual SAN from StarWind Management Console or from Web Console. Click Yes.

StarWind Management Console				
Storage pool is not configured! Would you like to configure it?				
	Yes Disconnect			

19. Select the disk recently mounted.



Open				×
📝 Back 🝌 New Folder 🚬 Delete				
VSA Storage media mnt	Name	Size	Date 05/10/2019 07:24	Attributes
File name:			~	Open Cancel

Creating Starwind Ha Luns Using Powershell

1. Open PowerShell ISE as Administrator.

2. Open StarWindX sample CreateHA_2.ps1 using PowerShell ISE. It can be found here: C:\Program Files\StarWind Software\StarWind\StarWindX\Samples\

NOTE: The script below creates a 1TB size 2-node HA device with a heartbeat failover strategy on StarWind nodes with management IP addresses 192.168.0.1 and 192.168.0.2 correspondingly.

The IP addresses 172.16.10.1 and 172.16.10.2 are used as heartbeat interfaces along with 192.168.0.1 and 192.168.0.2 for redundancy.

The IP addresses 172.16.20.1 and 172.16.20.2 on each node correspondingly as well as 172.16.21.1 and 172.16.21.2 are used for the devices synchronization between the nodes.

The script does not create a directory. Make sure you create the directory listed as \$imagePath value before running the script.

Make sure to open 3261 and 3260 ports.

The same approach applies to CreateHA_3.ps1 which allow to create a 3-way replica HA device.

3. Configure script parameters according to the following example:

One Stop Virtualization Shop



```
param($addr="192.168.0.1", $port=3261, $user="root",
$password="starwind",
      $addr2="192.168.0.2", $port2=$port, $user2=$user,
$password2=$password,
#common
      $initMethod="NotSynchronize",
      $size=1048576,
      $sectorSize=512,
      $failover=0,
      $bmpType=1,
      $bmpStrategy=0,
#primary node
      $imagePath="/mnt/sdb1/volume1",
      $imageName="device1",
      $createImage=$true,
      $storageName="",
      $targetAlias="target1",
      $poolName="pool1",
      $syncSessionCount=1,
      $alua0ptimized=$true,
      $cacheMode="none",
      $cacheSize=0,
      $syncInterface="#p2=172.16.20.2:3260,172.16.21.2:3260",
      $hbInterface="#p2=172.16.10.2:3260,192.168.0.2:3260",
      $createTarget=$true,
      $bmpFolderPath="",
#secondary node
      $imagePath2="/mnt/sdb1/volume1",
      $imageName2="device1",
      $createImage2=$true,
      $storageName2="",
      $targetAlias2="target1",
      $poolName2="pool1",
      $syncSessionCount2=1,
      $aluaOptimized2=$false,
      $cacheMode2=$cacheMode,
      $cacheSize2=$cacheSize,
      $syncInterface2="#p1=172.16.20.1:3260,172.16.21.1:3260",
      $hbInterface2="#p1=172.16.10.1:3260,192.168.0.1:3260",
      $createTarget2=$true,
      $bmpFolderPath2=""
 )
Import-Module StarWindX
```



```
try
{
        Enable-SWXLog -level SW LOG LEVEL DEBUG
        $server = New-SWServer -host $addr -port $port -user
$user -password $password
        $server.Connect()
        $firstNode = new-Object Node
        $firstNode.HostName = $addr
        $firstNode.HostPort = $port
        $firstNode.Login = $user
        $firstNode.Password = $password
        $firstNode.ImagePath = $imagePath
        $firstNode.ImageName = $imageName
        $firstNode.Size = $size
        $firstNode.CreateImage = $createImage
        $firstNode.StorageName = $storageName
        $firstNode.TargetAlias = $targetAlias
        $firstNode.AutoSynch = $autoSynch
        $firstNode.SyncInterface = $syncInterface
        $firstNode.HBInterface = $hbInterface
        $firstNode.PoolName = $poolName
        $firstNode.SyncSessionCount = $syncSessionCount
        $firstNode.ALUAOptimized = $aluaOptimized
        $firstNode.CacheMode = $cacheMode
        $firstNode.CacheSize = $cacheSize
        $firstNode.FailoverStrategy = $failover
        $firstNode.CreateTarget = $createTarget
        $firstNode.BitmapStoreType = $bmpType
        $firstNode.BitmapStrategy = $bmpStrategy
        $firstNode.BitmapFolderPath = $bmpFolderPath
        #
        # device sector size. Possible values: 512 or 4096(May
be incompatible with some clients!) bytes.
        #
        $firstNode.SectorSize = $sectorSize
        $secondNode = new-Object Node
        $secondNode.HostName = $addr2
        $secondNode.HostPort = $port2
        $secondNode.Login = $user2
```



```
$secondNode.Password = $password2
        $secondNode.ImagePath = $imagePath2
        $secondNode.ImageName = $imageName2
        $secondNode.CreateImage = $createImage2
        $secondNode.StorageName = $storageName2
        $secondNode.TargetAlias = $targetAlias2
        $secondNode.AutoSynch = $autoSynch2
        $secondNode.SyncInterface = $syncInterface2
        $secondNode.HBInterface = $hbInterface2
        $secondNode.SyncSessionCount = $syncSessionCount2
        $secondNode.ALUAOptimized = $aluaOptimized2
        $secondNode.CacheMode = $cacheMode2
        $secondNode.CacheSize = $cacheSize2
        $secondNode.FailoverStrategy = $failover
        $secondNode.CreateTarget = $createTarget2
        $secondNode.BitmapFolderPath = $bmpFolderPath2
        $device = Add-HADevice -server $server -firstNode
$firstNode -secondNode $secondNode -initMethod $initMethod
       while ($device.SyncStatus -ne
[SwHaSyncStatus]::SW HA SYNC STATUS SYNC)
        {
                $syncPercent =
$device.GetPropertyValue("ha synch percent")
                Write-Host "Synchronizing: $($syncPercent)%" -
foreground yellow
                Start-Sleep -m 2000
                $device.Refresh()
        }
}
catch
{
       Write-Host $ -foreground red
}
finally
{
        $server.Disconnect()
}
```

Detailed explanation of script parameters:

-addr, -addr2 — partner nodes IP address. Format: string. Default value: 192.168.0.1, 192.168.0.2



allowed values: localhost, IP-address -port, -port2 — local and partner node port. Format: string. Default value: 3261 -user, -user2 — local and partner node user name. Format: string. Default value: root -password, -password2 — local and partner node user password. Format: string. Default value: starwind

#common
-initMethod - set the initial synchronization option.
Format: string.
Values:
Clear - default
NotSynchronize - skips synchronization (works ONLY IF THERE IS NO DATA TO SKIP THE
ORIGINAL SYNCHRONIZATION).
SyncFromFirst or SyncFromSecond or SyncFromThird - runs full synchronization from the
specific node. Use it for recreating replicas.

-size – set size for HA-device (in MB) Format: integer. Default value: 12

-sectorSize – set sector size for HA-device Format: integer. Default value: 512 allowed values: 512, 4096

-failover – set type failover strategy Format: integer. Default value: 0 (Heartbeat) allowed values: 0, 1 (Node Majority)

-bmpType – set bitmap type, is set for both partners at once Format: integer. Default value: 1 (RAM) allowed values: 1, 2 (DISK)

-bmpStrategy – set journal strategy, is set for both partners at once Format: integer. Default value: 0 allowed values: 0, 1 – Best Performance (Failure), 2 – Fast Recovery (Continuous)

-storageName is used only if you plan to add the partner to the existing device. For CreateHA_2.ps1 use, leave it as is.

#primary node
-imagePath - set path to store the device file
Format: string. Default value: My computer\C\starwind". For Linux the following format
should be used: "VSA Storage\mnt\mount_point"



-imageName - set name device Format: string. Default value: masterImg21 -createlmage - set create image file Format: boolean. Default value: true -targetAlias - set alias for target Format: string. Default value: targetha21 -poolName – set storage pool. Do not change it and keep default value. Format: string. Default value: pool1 -aluaOptimized – set Alua Optimized Format: boolean. Default value: true -cacheMode - set type L1 cache (optional parameter) Format: string. Default value: wb allowed values: none, wb, wt -cacheSize - set size for L1 cache in MB (optional parameter) Format: integer. Default value: 128 allowed values: 1 and more -syncInterface - set sync channel IP-address from partner node Format: string. Default value: "#p2={0}:3260" -hbInterface - set heartbeat channel IP-address from partner node Format: string. Default value: "" -createTarget - set creating target Format: string. Default value: true Even if you do not specify the parameter -createTarget, the target will be created automatically. If the parameter is set as -createTarget \$false, then an attempt will be made to create the device with existing targets, the names of which are specified in the -targetAlias (targets must already be created) -bmpFolderPath - set path to save bitmap file Format: string. #secondary node -imagePath2 - set path to store the device file Format: string. Default value: "My computer\C\starwind". For Linux the following format should be used: "VSA Storage\mnt\mount_point" -imageName2 - set name device Format: string. Default value: masterImg21 -createlmage2 - set create image file Format: boolean. Default value: true -targetAlias2 - set alias for targetFormat: string. Default value: targetha22 -poolName2 - set storage pool. Do not change it and keep default value. Format: string. Default value: pool1 -aluaOptimized2 – set Alua Optimized

Format: boolean. Default value: true



-cacheMode2 – set type L1 cache (optional parameter) Format: string. Default value: wb allowed values: wb, wt -cacheSize2 – set size for L1 cache in MB (optional parameter) Format: integer. Default value: 128 allowed values: 1 and more -syncInterface2 – set sync channel IP-address from partner node Format: string. Default value: "#p1={0}:3260" -hbInterface2 - set heartbeat channel IP-address from partner node Format: string. Default value: "" -createTarget2 - set creating target Format: string. Default value: true Even if you do not specify the parameter -createTarget, the target will be created automatically. If the parameter is set as -createTarget \$false, then an attempt will be made to create the device with existing targets, the names of which are specified in the targetAlias (targets must already be created) -bmpFolderPath2 - set path to save bitmap file Format: string.

IMPORTANT: If the script should be executed again with the same parameters, (for example, the first time execution has failed) make sure to do the following for one node at a time before the next attempt to execute the script:

1. Stop StarWind Service:

sudo systemctl stop starwind-virtual-san

2. Go to /opt/starwind/starwind-virtual-san/drive_c/starwind/headers and delete the headers you do not need.

3. Go to the underlying storage specified as \$imagePath and delete the header and imagefile there.

4. Go to the folder with StarWind.cfg (/opt/starwind/starwind-virtual-

san/drive_c/starwind/StarWind.cfg) and copy it.

5. Edit StarWind.cfg:

sudo nano /opt/starwind/starwind-virtualsan/drive_c/starwind/StarWind.cfg

6. Navigate under <targets>, remove target you do not need.

7, Navigate under <devices>, and remove the device entry you do not need.

8. Start the service:

sudo systemctl start starwind-virtual-san



- 9. Wait for the devices synchronization.
- 9. Repeat for the remaining StarWind VSAN instance.

Selecting The Failover Strategy

StarWind provides 2 options for configuring a failover strategy:

Heartbeat

The Heartbeat failover strategy allows avoiding the "split-brain" scenario when the HA cluster nodes are unable to synchronize but continue to accept write commands from the initiators independently. It can occur when all synchronization and heartbeat channels disconnect simultaneously, and the partner nodes do not respond to the node's requests. As a result, StarWind service assumes the partner nodes to be offline and continues operations on a single-node mode using data written to it.

If at least one heartbeat link is online, StarWind services can communicate with each other via this link. The device with the lowest priority will be marked as not synchronized and get subsequently blocked for the further read and write operations until the synchronization channel resumption. At the same time, the partner device on the synchronized node flushes data from the cache to the disk to preserve data integrity in case the node goes down unexpectedly. It is recommended to assign more independent heartbeat channels during the replica creation to improve system stability and avoid the "split-brain" issue.

With the heartbeat failover strategy, the storage cluster will continue working with only one StarWind node available.

Node Majority

The Node Majority failover strategy ensures the synchronization connection without any additional heartbeat links. The failure-handling process occurs when the node has detected the absence of the connection with the partner.

The main requirement for keeping the node operational is an active connection with more than half of the HA device's nodes. Calculation of the available partners is based on their "votes".

In case of a two-node HA storage, all nodes will be disconnected if there is a problem on the node itself, or in communication between them. Therefore, the Node Majority failover strategy requires the addition of the third Witness node or file share (SMB) which participates in the nodes count for the majority, but neither contains data on it nor is involved in processing clients' requests. In case an HA device is replicated between 3 nodes, no Witness node is required.

With Node Majority failover strategy, failure of only one node can be tolerated. If two nodes fail, the third node will also become unavailable to clients' requests.



Please select the required option:

Preparing Datastores

Adding Discover Portals

1. To connect the previously created devices to the ESXi host, click on the Storage -> Adapters -> Software iSCSI and in the appeared window choose the Enabled option to enable Software iSCSI storage adapter. Push the Save configuration button.

🕐 esxi01.starwind.local - VMware 🗄 🗙 🕂			• - • ×
← → C ▲ Not secure 192.168.12.225	ui/#/host/storage/adapters		☆ 😩 :
vmware esxi		rool@192.168.12.225 + He	elp 🗸 🔍 Search 🕞
📲 Navigator 💿 📄 esxi01.sta	wind.local - Storage		
▼ 🗒 Host Datastores	Adapters Devices Persistent M	lemory	
Manage Monitor	re iSCSI 💆 Software iSCSI 💻 Rescan 📔	C Refresh 🏟 Actions	Q Search
▼ 🔂 Virtual Machines 🚺 Name	Configure iSCSI - vmhba65		
✓	iSCSI enabled	O Disabled Enabled	
More VMs	64 ► Name & alias	iqn.1998-01.com.vmware:esxi01.starwind.local:267261470:65 (iscsi_vmk)	
Storage 1 Solution 3	▶ CHAP authentication	Do not use CHAP	
(a) (a)	Mutual CHAP authentication	Do not use CHAP V	
	Advanced settings	Click to expand	
	Network port bindings	Man Add port binding 🛛 🙀 Remove port binding	
		VMkernel NIC v Port group v IPv4 addr	ess 🗸
		No port bindings	
	Static targets	💯 Add static target 🛛 👰 Remove static target 🥜 Edit settings	Q Search
		Target ~ Address ~	Port ~
		No static targets	
	Dynamic targets	🙋 Add dynamic target 🛛 👰 Remove dynamic target 🥜 Edit settings	Q Search
		Address v Port	~
E Recent tas	(5		Save configuration Cancel

2. In the Configure iSCSI window, under Dynamic Targets, click on the Add dynamic target button to specify iSCSI interfaces.



esxi01.starwind.local - VMware E	+			• - • ×
← → C ▲ Not secure 1	92.168.12.225/ui/#/ł	host/storage/adapters		☆ 😩 :
vmware' Esxi"			root@192	2.168.12.225 • Help • Q Search •
Navigator	esxi01.starwind.l	local - Storage		
✓ ☐ Host Manage	Datastores A	Adapters Devices Persistent Mer	mory	
Monitor	Configure iSC	SI 💆 Software iSCSI 💻 Rescan 🛛 🌔	CRefresh Actions	Q Search
👻 🔂 Virtual Machines 🚺	Name		v Model v	Status
👻 🔂 SW1	对 vmhba0	Configure iSCSI		
Monitor More VMs	vmhba1	▶ Name & alias	iqn.1998-01.com.vmware:esxi01.starwind.local:267261470:65 (iscsi_vmk)	
Storage 1	Viinba04	 CHAP authentication 	Do not use CHAP ~	
	for and	Mutual CHAP authentication	Do not use CHAP ~	
		Advanced settings	Click to expand	
		Network port bindings	🞥 Add port binding 🛛 🙀 Remove port binding	
			VMkernel NIC v Port group	✓ IPv4 address ✓
			No port bindings	
		Static targets	💯 Add static target 🛛 👰 Remove static target 🥒 Edit settings	Q Search
			Target ~ Address	s v Port v
			No static targets	
		Dynamic targets	💆 Add dynamic target 🛛 🦉 Remove dynamic target 🥜 Edit settings	Q Search
			Address ~ Port	~
			Click to add address 3260	
	🕄 Recent tasks			Save configuration Cancel
https://192.168.12.225/ui/				

3. Enter the iSCSI IP addresses of all StarWind nodes for the iSCSI traffic.

🙋 Add dynamic target 🛛 👰 Remove dynamic target 🥒 Edit s	ettings Q Search
Address ~	Port ~
172.16.10.10	3260
Click to add address	3260
	Save configuration Cancel

Confirm the actions by pressing Save configuration.

4. The result should look like in the image below.



Configure iSCSI							
iSCSI enabled	O Disabled Enabled						
 Name & alias 	iqn.1998-01.com.vmware:sw-mar-pc3-6fbab	48a					
 CHAP authentication 	Do not use CHAP	T					
 Mutual CHAP authentication 	Do not use CHAP	T					
 Advanced settings 	Click to expand						
Network port bindings	🕍 Add port binding 🛛 💐 Remove port bin	ding					
	VMkernel NIC ~	~	IPv4 addr	ess	~		
	No port bindings						
Static targets	🙋 Add static target 🛛 🧟 Remove static ta	rget 🥖 Edit settings			Q Search		
	Target	~	Address	~	Port	~	
	iqn.2008-08.com.starwindsoftware:sw1-ds	1	172.16.10.10		3260		
	iqn.2008-08.com.starwindsoftware:sw1-ds	2	172.16.10.10		3260		
	iqn.2008-08.com.starwindsoftware:sw2-ds	1	172.16.10.20		3260		
	iqn.2008-08.com.starwindsoftware:sw2-ds	2	172.16.10.20		3260		
Dynamic targets	🛃 Add dynamic target 🛛 🧕 Remove dyna	amic target 🥜 Edit s	ettings		Q Search		
	Address	~	Port			~	
	172.16.10.10		3260				
	172.16.10.20		3260				
				5	Save configuration	Cancel	

5. Click on the Rescan button to rescan storage.

Datastores	Adapters	Devices	Persistent Men	nory						
🗐 New datas	tore 🖭 Incre	ase capacity	📃 Rescan 🌘	CRefresh	4 Actions					
Name				~	Status 🔺	~	Туре	~	Capacity	~
local NEC	CVMWar CD-RC	DM (mpx.vmhb	oa1:C0:T0:L0)		Normal		CDROM		Unknown	
Local VMware Disk (mpx.vmhba0:C0:T1:L0)			📀 Normal		Disk		50 GB			
Local VMv	vare Disk (mpx.	vmhba0:C0:T	0:L0)		Normal		Disk		40 GB	
STARWIN	D iSCSI Disk (e	eui.60e7edcce	eae5b4e)		Normal		Disk		3 GB	
STARWIN	D iSCSI Disk (e	eui.4649d8befl	pe79223)		Normal		Disk		3 GB	

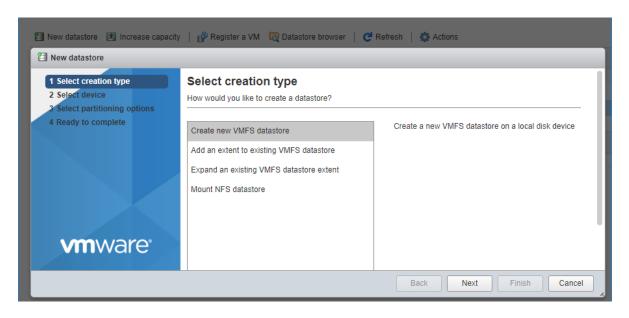
6. Now, the previously created StarWind devices are visible to the system.

7. Repeat all the steps from this section on the other ESXi host, specifying corresponding IP addresses for the iSCSI subnet.

Creating Datastores

1. Open the Storage tab on one of your hosts and click on New Datastore.





2. Specify the Datastore name, select the previously discovered StarWind device, and click Next.

省 New datastore 🛛 Increase capacit	y 📋 🚰 Register a VM 🛛 🛱 Datastore browse	er C Refrest	n 🏠 Actio	ns		
Name	~	Drive Type	~	Capacity	`	Provisioned
🔁 New datastore - DS1						
 1 Select creation type 2 Select device 3 Select partitioning options 4 Ready to complete 	Select device Select a device on which to create a new VMF Name DS1	FS partition				
	The following devices are unclaimed and can Name	~	Туре	~ Capacity		ree space 🗸 🗸
	STARWIND ISCSI Disk (eui.22ae584be2		Disk Disk	5 GB 6 GB		GB GB 2 items
vm ware [®]			R	ack Next		inish Cancel

3. Enter datastore size and click Next.



🗄 New datastore - DS1				
 1 Select creation type 2 Select device 3 Select partitioning options 4 Ready to complete 	Select partitioning optic Select how you would like to partition for Use full disk			
vmware [.]	Before, select a partition Free space (5 f	Aft	ter 1. VMFS (5 GB)
			Back Next	Finish Cancel

4. Verify the settings and click Finish.

5. Add another Datastore (DS2) in the same way but select the second device for the second datastore.

6. Verify that your storages (DS1, DS2) are connected to both hosts. Otherwise, rescan the storage adapter.

😫 New datastore 📧 increase capacity 🧬 Register a VM 🍓 Datastore browser 🦿 Refresh 🎲 Actions								
Name	Drive Type 🗸 🗸	Capacity ~	Provisioned ~	Free				
atastore1 (1)	Non-SSD	32.5 GB	972 MB	31.55 GB				
DS1	Non-SSD	4.75 GB	1.41 GB	3.34 GB				
DS2	Non-SSD	5.75 GB	1.41 GB	4.34 GB				

NOTE: Path Selection Policy changing for Datastores from Most Recently Used (VMware) to Round Robin (VMware) is added into the Rescan Script, and this action is performed automatically. For checking and changing this parameter manually, the hosts should be connected to vCenter.

Multipathing configuration can be checked only from vCenter. To check it, click the Configure button, choose the Storage Devices tab, select the device, and click the Edit Multipathing button.



		Storage Devices								
Storage	1	🛃 🚊 🗟 🖬 🛋 🥥 🥥 💶 🎇 Ali A	ctions -	-	•				Q	Filter
Storage Adapters		Name	LUN		Туре	Capacity	Operational State	Hardware Acceleration	Drive Type	Transport
Storage Devices		Local VMware Disk (mpx.vmhba0:C0:T0:L0)		0	disk	40,00 GB	Attached	Not supported	HDD	Parallel SCSI
Datastores	::	Local NECVMWar CD-ROM (mpx.vmhba64:C0:T0		0	cdrom		Attached	Not supported	HDD	Block Adapter
Host Cache Configuration		STARWIND iSCSI Disk (eui.22ae584be2580eda)		0	disk	5,00 GB	Attached	Supported	HDD	iSCSI
Protocol Endpoints		STARWIND iSCSI Disk (eui.8d6cd81bccb9730d)		0	disk	6,00 GB	Attached	Supported	HDD	iSCSI
I/O Filters	-									
Networking						=				
Virtual switches		Device Details								
VMkernel adapters		Properties Paths								
Physical adapters		Logical Parations U								
TCP/IP configuration										
		Multipathing Policies								Edit Multipathing
Advanced		Path Selection Policy Most Recently Used	(VMwa	re)						
Advanced Virtual Machines		Fi dai ociccioni oney								

Path selection policy: Round Robin (VMware)					
Select the preferred path f	or this policy:			· · ·	
₽ .		Q	Q Filter		
Runtime Name	Status	Target	LUN	Preferred	
vmhba65:C0:T3:L0	 Active 	iqn.2008-08.com.starwindsoftware:sw	0		
vmhba65:C0:T1:L0	 Active (I/O) 	iqn.2008-08.com.starwindsoftware:sw	0		

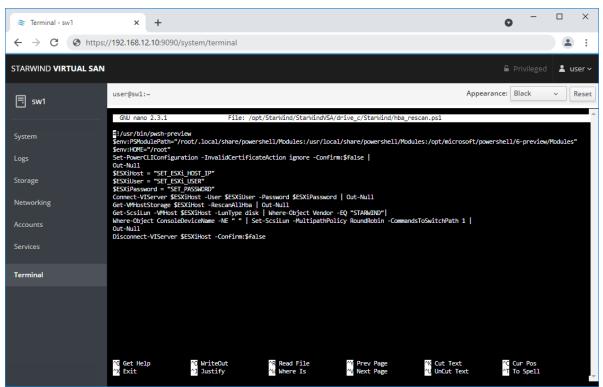
Configuring An Automatic Storage Rescan

1. Open the Terminal page.

2. Edit file /opt/StarWind/StarWindVSA/drive_c/StarWind/hba_rescan.ps1 with the following command:



sudo nano /opt/StarWind/StarWindVSA/drive_c/StarWind/hba_rescan.ps1



3. In the appropriate lines, specify the IP address and login credentials of the ESXi host (see NOTE below) on which the current StarWind VM is stored and running:
\$ESXiHost = "IP address"
\$ESXiUser = "Login"
\$ESXiPassword = "Password"

NOTE: In some cases the rescan script can be changed and storage rescan added for another ESXi host. Appropriate lines should be duplicated and changed with properly edited variables if required.

NOTE: In some cases, it makes sense to create a separate ESXi user for storage rescans. To create the user, please follow the steps below:

Log in to ESXi with the VMware Host Client. Click Manage, and under Security & users tab, in the Users section click Add user button. In the appeared window, enter a user name, and a password.



📲 esxi01.starwind.local - VMware E 🗙	+		0	- 0	×
← → C ▲ Not secure 19	92.168.12.225/ui/#/host/manage/secur	ity/users		\$:
vm ware [,] ESXi ^{,,}		root@15	92.168.12.225 👻 Help 👻 🔍 Sear	ch	P
E Navigator	esxi01.starwind.local - Manage				
 Bost Manage Monitor Virtual Machines SV1 SV1 Monitor More VMs Storage with vmhba65 More storage Metworking 	Authentication U Certificates U Users ro Roles Lockdown mode	Packages Services Security Add user Image: Control of the security of the	virity & users Seer Refresh Search Description Administrator rescan Storage rescan Multiple Add Cancel	1 items	
	Recent tasks				

Create a new Role, under Roles section, and click New Role button. Type a name for the new role. Select privileges for the role and click OK.

The following privileges might be assigned: Host – Inventory, Config, Local Cim, and Global – Settings.

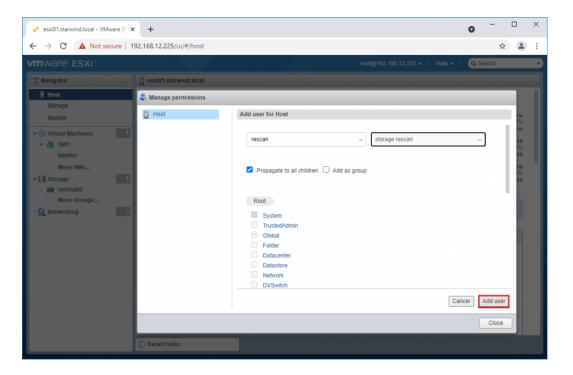
📲 esxi01.starwind.local - VMware Es 🗴	< +		0	- 0	×
← → C ▲ Not secure 1	92.168.12.225/ui/#/host/manage/sec	urity/roles		☆ .	. :
			root@192.168.12.225 👻 Help 👻 🔍 S	arch	
Navigator	esxi01.starwind.local - Manage				
Host Manage Monitor	System Hardware Licensin	g Packages Services Se	role CRefresh Q Search		
 ✓ Intual Machines ✓ Intual SW1 	Authentication	Add a role			
Monitor More VMs	Roles Lockdown mode	Role name (required)	storage rescan		
Storage More storage More storage More storage		Privileges	Root System CrustedAdmin Global Folder Datacenter Datastore Network DVSwitch DVPortgroup Host VirtualMachine Resource		
	🗐 Recent tasks		Add	Cancel	



Assign permission to the storage rescan user for an ESXi host – right-click Host in the VMware Host Client inventory and click Permissions. In the appeared window click Add user.

Click the arrow next to the Select a user text box and select the user that you want to assign a role to. Click the arrow next to the Select a role text box and select a role from the list.

(Optional) Select Propagate to all children or Add as group. Click Add user and click Close.



Make sure that rescan script is working and execute it from the VM: sudo /opt/StarWind/StarWindVSA/drive_c/StarWind/hba_rescan.ps1

4. Repeat all steps from this section on the other ESXi hosts.

Performance Tweaks

1. Click on the Configuration tab on all of the ESXi hosts and choose Advanced Settings.



Advanced settings	🥒 Edit option 🛛 🤁 Refresh 🛛 🧛 Actions	
Autostart	Кеу 🔺	✓ Name
wap		 Name Delay in miniseconds for completion or commands with a boot status
Time & date	Disk.DeviceReclaimTime	The number of seconds between device re-claim attempts
	Disk.DisableVSCSIPollInBH	Disable VSCSI_Poll in bottom half. Set to 1 to disable.
	Disk.DiskDelayPDLHelper	Delay PDL helper in secs
	Disk.DiskMaxIOSize	Max Disk READ/WRITE I/O size before splitting (in KB)
	Disk.DiskReservationThreshold	Time window within which refcounted reservations on a device are perm
	Disk.DiskRetryPeriod	Retry period in milliseconds for a command with retry status
	Disk.DumpMaxRetries	Max number of I/O retries during disk dump
	Disk.DumpPollDelay	Number of microseconds to wait between polls during a disk dump.
	Disk.DumpPollMaxRetries	Max number of device poll retries during disk dump
	Disk.EnableNaviReg	Enable automatic NaviAgent registration with EMC CLARiiON and Invis
	Disk.FailDiskRegistration	Fail device registration if disk has only standby paths and supports only
	Disk.FastPathRestoreInterval	Time interval (in msec) to monitor the IO latency to evaluate eligibility fo
	Disk.IdleCredit	Amount of idle credit that a virtual machine can gain for I/O requests

2. Select Disk and change the Disk.DiskMaxIOSize parameter to 512.

System Hardware Lice	nsing Packages Services	Security & users
Advanced settings	🥒 Edit option 🕴 🧲 Refresh 🏻 🗧	Actions
Autostart Swap Time & date	Key Disk. Delay Of Dusy Disk. DeviceReclaimTime Disk. DisableVSCSIPollInBH	~
	Disk.DiskDelayPDLHelper Disk.DiskMaxIOSize	
	Edit option - Disk.DiskMaxIOS	ize
	New value	512 (long integer)
		Save Cancel
	Quick filters	•

3. To optimize performance change I/O scheduler options according to the article below: https://knowledgebase.starwindsoftware.com/guidance/starwind-vsan-for-vsphere-changi ng-linux-i-o-scheduler-to-optimize-storage-performance/

NOTE: Changing Disk.DiskMaxIOSize to 512 might cause startup issues with Windowsbased VMs, located on the datastore where specific ESX builds are installed. If the issue with VMs start appears, leave this parameter as default or update the ESXi host to the next available build.

NOTE: To provide high availability for clustered VMs, deploy vCenter and add ESXi hosts to the cluster.

Click on Cluster -> Configure -> Edit and check the turn on vSphere HA option if it's



licensed.

Betting Started	Summary Monitor Configure	Permissions Hosts VMs D	atastores Networks Upda	ite Manager
"	SWVCluster - Edit Cluster Set	ttings		(?)
 Services 	vSphere DRS	vSphere Availability		
v Sphere D v Sphere Av	vSphere Availability	vSphere Availability is compr	ised of vSphere HA and Proact	ive HA. To enable Proactive
v SAN General	Failures and Responses Proactive HA Failures	☑ Turn ON vSphere HA		
Disk Mana	and Responses Admission Control	Turn on Proactive HA	Turn on DRS to enable	
Fault Doma Cluster	Heartbeat Datastores	Failure	Response	Details
Health and	Advanced Options	Host failure	 Restart VMs 	Restart VMs using V
iSCSI Targ		Proactive HA	Disabled	Proactive HA is not e
iSCSI Initia		Host Isolation	Disabled	VMs on isolated hos
Configurat		Datastore with Permanent Device Loss	Disabled	Datastore protection disabled.
Updates Configurat		Datastore with All Paths Down	Disabled	Datastore protection disabled.
General Licensing		Guest not heartbeating	Disabled	VM and application r
VMware EV				
VM/Host G		4		::
VM/Host R	(4

Conclusion

By following this guide the end-user can get a StarWind Virtual SAN deployed on VMware vSphere, with VSAN set up as a Controller Virtual Machine (CVM). The guide offers key insights and steps to ensure a seamless deployment.



Contacts

US Headquarters	EMEA and APAC
 +1 617 829 44 95 +1 617 507 58 45 +1 866 790 26 46 	 +44 2037 691 857 (United Kingdom) +49 800 100 68 26 (Germany) +34 629 03 07 17 (Spain and Portugal) +33 788 60 30 06 (France)
Customer Support Portal:	https://www.starwind.com/support
Support Forum:	https://www.starwind.com/forums

General Information: info@starwind.com

Sales: sales@starwind.com



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