

StarWind Virtual SAN: Bare-Metal Installation on a Physical Server

2024

TECHNICAL PAPERS





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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 is applicable to StarWind Virtual SAN and StarWind Virtual SAN Free (Version V8 (Build 15469, CVM Version 20240530) and later).

Purpose

This guide provides a comprehensive outline of how to install and configure StarWind Virtual SAN on a physical or virtual server and create StarWind devices using the Web UI for further utilization by industry-standard hypervisors or server systems. It includes links to the system requirements, RAID settings, best practices, and steps to ensure seamless setup and integration.

Audience

The guide is for IT specialists, system administrators, and storage professionals who want to deploy and configure StarWind Virtual SAN on physical and virtual servers.

Expected Result

Users will possess a robust understanding of the steps and best practices for deploying and configuring StarWind Virtual SAN on commodity hardware.

Starwind Virtual San System Requirements

Before installing StarWind Virtual SAN on a physical machine, please ensure that the system meets the requirements listed here: https://www.starwindsoftware.com/system-requirements

Storage provisioning guidelines:

https://knowledgebase.starwindsoftware.com/guidance/how-to-provision-physical-storag e-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. Deploy StarWind Virtual SAN on each server using the ISO image downloaded from this page: https://www.starwindsoftware.com/vsan#download

2. Install a minimum of 2 network interfaces on each server for a 2-node cluster configuration, and a minimum of 4 network interfaces on each server for a 3-node cluster configuration. These interfaces will be utilized for Data/Heartbeat and Replication traffic. Allocate additional network interfaces for the Management network traffic based on needs.



IMPORTANT:

- Ensure that the Data/Heartbeat and Replication networks do not share the same physical link.
- Connect Data/Heartbeat and Replication links either through redundant switches or directly between nodes, as illustrated in Prerequisites: Solution diagram

NOTE: For a redundant, high-availability configuration, configure at least two network interfaces for the Data network and two network interfaces for the Replication network on each appliance. Ensure that the network interfaces are interconnected between appliances through multiple direct links or via redundant switches.

3. Once the Virtual SAN storage devices (LUNs) are configured, install any hypervisor or server operating system on a separate physical machine to utilize standalone and/or highly available storage devices (LUNs).

Installing Starwind Vsan On Physical Machine

1. Download the StarWind Virtual SAN ISO from https://www.starwindsoftware.com/vsan#download

2. Prepare the installation media using Etcher, Rufus on Windows workstation, or the dd command-line tool on Linux and macOS. For Network boot, mount the ISO to your server using iDRAC, iLo, or IPMI user interfaces.

3. Connect the installation media to your server and start the host.

4. Boot into the BIOS and enable Legacy boot mode. Save changes and reboot the host.

5. Upon server boot, press F12 or F2 to start the one-time boot menu. Select CD\DVD-ROM as the boot device.

Note: Refer to the server documentation to learn how to boot the menu key.

6. At this stage, the server should start booting the StarWind VSAN Live system. Once the system boots, the StarWind Text-based Installer launches.



×	_ + cvm1 on QEMU/KVM	
File	Virtual Machine View Send Key	
		53
	<pre>1 Started Daily Cleanup of Temporary Directories. 2 Started Ubuntu Advantage Timer for running repeated jobs. 3 Reached target System Time Set. 3 Reached target System Time Synchronized. 3 Started Daily apt download activities. 3 Started Daily apt upgrade and clean activities. 3 Started Daily man-db regeneration. 3 Started Daily man-db regeneration. 3 Started Message of the Day. 7 Reached target Timers. 1 Listening on UUD daemon activation socket. 2 Reached target Timers. 3 Started Daily on UUD daemon activation socket. 3 Started Daily on UUD daemon activation socket. 3 Started Daily apt UUD daemon activation socket. 3 Started Daily</pre>	
] Reached target Sockets.] Reached target Basic System. Starting Accounts Service	
[([(] Started D–Bus System Message Bus.] Started Save initial kernel messages after boot. Starting Remove Stale Onlimt4 Metadata Check Snapshots	
	<pre>] Started irqbalance daemon. Starting Dispatcher daemon for systemd-networkd Starting System Logging Service Starting Login Service Started RPC bind portmap service.] Started RPC bind portmap service.] Started Network Service.] Reached target Remote File Systems (Pre).] Reached target Remote File Systems (Pre).] Reached target RPC Port Mapper.] Listering on Load/Save RF Kill Switch Status /dev/rfkill Watch.] Started Regular background program processing daemon. Starting Discard unused blocks on filesystems from /etc/fstab Starting Network Name Resolution Starting Rotate log files Starting Doily man-db regeneration</pre>	
] Reached target Sound Card.	

7. Read the End-user License Agreement. Use the Tab button and arrow keys to select the Accept option, then press Enter.



×	_ + cvm1 on QEMU/KVM	
File	Virtual Machine View Send Key	:3
	License agreement	
	STARWIND LICENSE AGREEMENT FOR COMMERCIAL PRODUCTS This StarWind License Agreement (the "Agreement") is a legal agreement between the entity indicated on the signature page as "Licensee" or the license entity on whose behalf this Agreement is electronically executed by the authorized user (the "Licensee") and StarWind Software, Inc., a State of Delaware, USA corporation ("StarWind," and collectively with Licensee, the "Parties" and each, (a "Pary")), that is entered into as of the date of acceptance hereof by both Parties hereto (the "Effective Date"). Licensee is subject to the terms and conditions of this Agreement whether Licensee accesses or obtains StarWind Product directly from Website, or through any other source. By Using, installing, and/or Operating the StarWind Product clicensee agreement, StarWind is unwilling to license StarWind Product to Licensee of the terms and conditions of this Agreement. StarWind is unwilling to license StarWind Product will not install and shall not be installed on any computers, workstations, personal digital assistants, smarthones, mobile phones, hand-heid devices, or other electronic devices for which the Product was designed (each a "Client Device"), unless or until Licensee accepts the terms of this Agreement. Licensee may also receive a copy of this Agreement by contacting StarWind at: info@starwind.com. THS DOCUMENT, WNTL CONFIRMED BY STARWIND, CONSTITUTES AN OFFER BY LICENSEE, AND LICENSEE, BY EXECUTING THS DOCUMENT AGREEMENT, LICENSEE MAY DO SD BY EITHER (1) CHECKET WERKS OF THIS AGREEMENT AMOUGH A CLICK-THROUGH PROCEDURG BY STARWIND'S FINAL ACCEPTANCE THERE OF LICENSEE SUBMATE CHECKRON, OR C2) PRINTING DUT THIS AGREEMENT, LICENSEE MAY DO SD BY EITHER (1) CHECKING "I AGREE" USING THE DESCHART OF MARCEMENT AGREEMENT, LICENSEE MAY DO SD BY EITHER (1) CHECKING "I AGREE" USING THE DESCHART OF AGREEMENT AGREEMENT, LICENSEE MAY DO SD BY EITHER (1) CHECKING "I AGREE" USING THE DESCHART OF AGREEMENT AGREEMENT, LICENSEE MAY DO SD BY EITHER (1) CHECKING "	
	Accept Decline	

8. In the menu, select the "Install StarWind Appliance" option and press Enter.



× _ + cvm1 on Q	EMU/KVM
File Virtual Machine View Send Key	::
Available Options	Install StarWind Appliance
Install StarWind Appliance	Start the installation wizard to install StarWind Appliance on your physical or virtual hardware.
Cancel installation	
<up>/<down> Select option <enter> Perform action</enter></down></up>	<esc> Log out</esc>

9. Select one of the available disks on which to install StarWind VSAN, then press Enter.

Note: For OS redundancy, it is recommended to install VSAN on a RAID-1 (mirror) volume created on a Hardware RAID controller.



× _ +	cvm1 on QEMU/K	VM		
File Virtual Machine View S				
	9 - E			[]
StarWind Appliance Insta	illation			
	StarWind Appliance Installation wizard			
	To install StarWind Appliance on your hard from the list on which perform the instal.	dware, please selec lation.	t one disk	
	* All the data on selected disk will be o	verwritten.		
	List of available disks for the installat.	ion:		
	Disk name: vda Disk ciza: 2006			
	Disk model: 0x1af4			
	<up>/<down> Select Option</down></up>	<enter> Next</enter>	<esc> Cancel</esc>	

10. All data on the selected disk will be overwritten. Confirm the installation by typing "yes" and pressing Enter.



× _ +	cvm1 on	QEMU/KVM		
File Virtual Machine View	Send Key			
	b - b			
StarWind Appliance Insta	allation			
	StarWind Appliance Installation wi	zard		
	Confirm to start the installation.			
	* All data on selected disk will be	e overwritten.		
	Selected system disk:	Disk name: vda Disk size: 30Gb Disk model: 0x1af4		
	Type "yes" to confirm:	(yes	1	
	<up>/<down> Select Option</down></up>	<enter> Next</enter>	<esc> Cancel</esc>	

11. Wait until the installation finishes.



× _ +	cvm1 on QEMU/KVM	
File Virtual Machine View Se		
		53
StarWind Appliance Instal	llation	
	StarWind Appliance Installation wizard	
	Confirm to start the installation.	
	* All data on selected disk will be overwritten.	
	Installing StarWind Appliance	
	41 %	
•		

12. The installation is complete. Now you can select "Restart" to reboot the server.



8 - +	cvm1 on QEM	U/KVM		
File Virtual Machine View S	Send Key			
	0 • Ē			[]
StarWind Appliance Insta	allation			
	Installation complete			
	Select Restart or Shutdown button and p	press Enter.		
	Restart			
	Shutubuh			
	<up>/<down> Select Option</down></up>	<enter> Confirm</enter>	<esc> Cancel</esc>	

- 13. Eject the installation media.
- 14. The server now boots StarWind Virtual SAN.

Using Text-Based User Interface

1. Using iDRAC, iLo, or IPMI user interfaces, or a physical monitor connected to the server, open the Remote Console to check the management IP address in the Text-based User Interface (TUI).





2. StarWind VSAN gets its Management IP from your DHCP server if one is available on your network. If an IP address is DHCP-assigned, skip this section, and proceed to the Initial Configuration Wizard to configure using the Web console. Otherwise, assign a static IP address manually.

3. Log in to the Text-based User Interface (TUI) using the default credentials: username "user", password "rds123RDS" without quotes.



8 - +	cvm1 on (QEMU/KVM		
File Virtual Machine View S	Send Key			
	<u>v</u> – E			[]
Welcome! Authentication	is required			
	Welcome! Authentication is required			
	Please enter a valid password.			
	User name: Password:	[usen [xxxxxxxxxx	1	
		_		
		<enter> Confirm</enter>	<esc> Cancel</esc>	

Note: Ignore any error messages that appear on the TUI screen, such as "Failed to start nbd daemon". Once the network is configured, the dependent services will restart.

4. Navigate to the "Configure Management Network" option and press Enter.



x _ + cvm1 on QEMU/KVM			
	53		
Available Options	Configure Management Network		
Configure Management Network	Review and configure network settings.		
Configure NFS Share Configure SMB Share			
Troubleshoot			
<up>/<down> Select option <enter> Perform action</enter></down></up>	<pre><esc> Log out</esc></pre>		

5. Step 1/4 provides information on the network interface identified by the appliance as the management network and its settings.



😼 _ +	cvm1 or	n QEMU/KVM		
File Virtual Machine View S	Send Key			
	0 - Ē			53
Configure Management net	twork			
	Step 1/4: Configure Management net	work		
	Review current Management network	settings.		
	Press Enter to change network inte configuration.	rface and∕or modify IPv4		
	Network interface: MAC address:	enp10s0 52:54:00:8d:90:30		
	IP Mode: Management NIC IPv4 address: Subnet mask: Default gatewau:			
	Primary DNS: Alternate DNS:			
		<enter> Modify</enter>	<esc> Cancel</esc>	

6. At step 2/4 select the network interface to use for the management network connection, then press the Space key.



.



7. Specify network settings for the management connection with the following considerations:

- IPv4 address and network mask are required settings.
- The network mask can be specified as a subnet mask or in CIDR format.
- Gateway and DNS IP addresses are optional.
- Configuring Internet access by setting up the Gateway IP and DNS will allow checking, downloading, and installing in-place updates over the network.



🔯 – +	cvm1 on C	Rewn/kvw		
File Virtual Machine View S	Send Key			
	0 - 10			[]
Select network adapter				
	Step 3/4: Specify IPv4 con <u>figuratio</u> r			
	Set static IPv4 address and network	configuration for this	appliance's	
	default management connection. Press	S "Enter" to Apply the (configuration.	
	IP Mode:			
	Management NIC IPv4 Address: Subnet Mask: Default gateway:	[192.168.122.121 [255.255.255.0 [192.168.122.1]]]	
	Primary DNS: Alternate DNS:	[192.168.122.1_		
	 <td>(Enter) Annlu</td><td>(Esc) Cancel</td><td></td>	(Enter) Annlu	(Esc) Cancel	
		CENTER > hpp19	(ESC/ Guncer	

8. Press Enter to apply the management network configuration.



🗞 – +	cvm1 on QEMU/KVM	
File Virtual Machine View S	end Key	
		ίj
Select network adapter		
	Step 3/4: Specify IPv4 configuration Set static IPv4 address and network configuration for this appliance's default management connection. Press "Enter" to Apply the configuration. IP Mod Please wait Manage Please wait Subnet Image Defaul Network configuration successfully applied Altern Alert will automatically close in 1 sec. VUp>/ <down> Select Option <enter> Apply <esc> Dancel</esc></enter></down>	

9. Log out from TUI, then open a web browser to connect to your VSAN Web console by specifying the management IP address.

Initial Configuration Wizard

1. Using the web browser, open a new tab and enter the VM IPv4 address to open StarWind VSAN Web Interface. Click "Advanced" and then "Continue to..."





2. StarWind VSAN web UI welcomes you, and the "Initial Configuration" wizard will guide you through the deployment process.

Welcome to StarWind Appliance	
Follow the initial configuration wizard and complete the required steps of the appliance setup	
Start	

3. In the following step, upload the license file.



StarWind Appliance Initial confi	guration	
License	licence	
	Provide StarWind License file to continue	
	If you cannot find the license file, please contact your StarWind Sales Representative or send the request to: sales@starwind.com	
	Upload file StarWind license file (.swk)	
	Back Next	

4. Read and accept the End User License Agreement to proceed.

StarWind Appliance Initial config	guration	
✓ License		
	Review end-user license agreement	
• EULA	Review and accept the following license agreement to continue	
	SIARWIND LICENSE AURELMENT FUR COMMERCIAL FRODUCTS	
	This StarWind License Agreement (the "Agreement") is a legal agreement between the entity indicated on the signature page as 'Licensee' or the licensee entity on whose behalf this Agreement is electronically executed by the authorized user	
	(the "Licensee") and StarWind Software, Inc., a State of Delaware, USA corporation ("StarWind," and collectively with	
	Excerses, the "Fartes" and each, (a "Farty")), that is entered into as of the date of acceptance nervol by both Parties hereto (the "Effective Date").	
	Licensee is subject to the terms and conditions of this Agreement whether Licensee accesses or obtains StarWind Product	
	directly from Website, or through any other source. By Using, installing, and/or Operating the StarWind Product, Licensee arrees to be bound by the terms of this Agreement If Licensee does not arree to the terms and conditions of this	
	Agreement, StarWind is unwilling to license StarWind Product to Licensee. In such event, Licensee may not Use, install,	
	and/or Operate the StarWind Product in any way. The StarWind Product will not install and shall not be installed on any computers, workstations, personal digital assistants, smartphones, mobile phones, hand-held devices, or other electronic	
	devices for which the Product was designed (each a " <i>Client Device</i> "), unless or until Licensee accepts the terms of this Argument Licensee may also require a room of this Argument bu contacting StatMind at: info@stanuid.com	
	Parenten, source may and receive a copy of the agreement of contacting startwide as integrate ministron,	
	THIS DOCUMENT, UNTIL CONFIRMED BY STARWIND, CONSTITUTES AN OFFER BY LICENSEE, AND LICENSEE, BY EXECUTING THIS DOCUMENT AGREES TO THE TERMS SET FORTH HEREIN, PROVIDED THAT LICENSEE HEREBY EXPRESSLY AGREES THAT	
	THIS AGREEMENT ONLY BECOMES EFFECTIVE UPON STARWIND'S FINAL ACCEPTANCE, APPROVAL AND EXECUTION THEREOF.	
	THROUGH A CLICK-THROUGH PROCEDURE. IF LICENSEE DOES NOT WISH TO ACCEPT THIS OFTER OF AGREEMENT	
	I accept the terms of the license agreement	
	Back Next	

5. Review or edit the Network settings and click Next.

NOTE: Static network settings are recommended for the configuration.



StarWind Appliance Initial configu	ration						
✓ License ✓ EULA	Configure managen	nent network s (static is recommended) a	nd configure other netw	work settings.			
Management network	i The Management network is u			nd to access the applian			
	Static						
	NIC Model	Bandwidt	h MAC address	IP address	Netmask	Gateway	
	ens160 82574L Gig	gabit Ne 1 Gb		192.168.12.206	255.255.254.0	192.168.12.1	
	Name servers (optional):						
	DNS 1 192.168.12.17						
	Time settings (optional):						
			Time zone UTC				
					Back	Next	

6. Specify the hostname for the VSAN appliance and click Next.

StarWind Appliance Initial confi	guration	
✓ License		
🖌 FUI A	Verify hostname	
V LOLA	Check the current appliance hostname and modify it if required	
 Management network 	 Use Latin letters, numbers, and dash 	
Static hostname		
	SW1	
	Back Next	

7. Create an administrator account. Click Next.



Conditional Association on Initial association		
Starwind Appliance Initial config	uration	
✓ License		
	Create administrator account	
V EULA	Specify new credentials for the appliance administrator account	
Management network		
 Management network 		
 Static hostname 	admin	
Administrator account		
	······	
	Additional information (optional)	
	Back Next	

8. Review your settings selection before setting up StarWind VSAN.

StarWind Appliance Initial config	uration			
✓ License				
	Review summary			
🗸 EULA				
 Management network 	License type			
A Static hostnamo	License			
• Static nostname				
. A desinistrator assount				
Administrator account	Network settings			
Summary	Interface	ens160 (82574L Gigabit Network Connection)		
	Bandwidth			
	MTU			
	IP address	192 169 12 206		
	ir address			
	Appliance hostname			
	Credentials			
	Administrator username	admin		
	Administrator username			
			Back Confi	gure

9. Please standby until the Initial Configuration Wizard configures StarWind VSAN for you.



StarWind Appliance Initial config	uration		
✓ License ✓ EULA ✓ Management network	Configuring settings Please wait until all specified settings are applied		
 ✓ Static hostname ✓ Administrator account 	Progress: 0%	Ö Time remaining: - 3 sec	
✓ Summary	Applying license Configuring management network		
e congunton			
		×	

10. The appliance is set and ready. Click on the Done button to install the StarWind vCenter Plugin right now or uncheck the checkbox to skip this step and proceed to the Login page.

StarWind Appliance Initial configuration	
Initial configuration completed The essential settings were successfully configured. Press "Finish" to close the wizard and navigate to the login page.	
You can also install the StarWind vSphere plug in if you want to access the StarWind Appliance web UI from your vSphere console.	
Launch the StarWind vCenter plug-in installation wizard.	
Finds	

11. Repeat the initial configuration on other StarWind VSAN appliances that will be used to create 2-node or 3-node HA shared storage.



Add Appliance

To create 2-way or 3-way synchronously replicated highly available storage, add partner appliances that use the same license key.

1. Add StarWind appliance(s) in the web console, on the Appliances page. NOTE: The newly added appliance will be linked to already connected partners.

StarWind			
🚔 Dashboard	App Add appliance		
🛢 Storage 🔻	Credentials		
🚑 Network		Credentials	
🗮 Appliances		Specify the appliance IP address and its administrator credentials	
🚊 Users		The newly added appliance will be linked to already connected partners.	
📋 Tasks and events 🛛 🔻			
		Administrator username	
		k	
		Cancel Next	
< Minimize			

2. Provide credentials of partner appliance.



StarWind			🗉 🌲 🏠 admin 💌
	App Add appliance		
	Credentials	Credentials	Q ±
		Specify the appliance IP address and its administrator credentials The newly addred anniliance will be linked to already connected partners.	Raw capacity 🗢
		IP address 192,168,12,166	
		Administrator usemame admin	
		Cancel	

3. Wait for connection and validation of settings.

StarWind		
Control Contr	Add appliance • credentials summary • Credentials Specify the appliance VP address and its administrator credentials. • The newly added appliance will be larked to already connected partners. • Use the appliance connected partners. • Diministrator connected partners. • Other newly added appliance will be larked to already connected partners. • Diministrator connected partners. • Diministrator connected partners. • Diministrator connected partners. • Other newly added appliance will be larked to already connected partners. • Diministrator connection of appliance. • Other newly added appliance connected partners.	L N L CC
< Minimize		

4. Review the summary and click "Add appliance".



StarWind hyperconvergence			🖽 🌲 🧔 admin 💌
	App Add appliance		
	CredentialsSummary	Summary	Q
		Appliance name SW2 Storage capacity 0 GB Storage pools 0	0 Bytes
		Back Add appliance	

Configure Ha Networking

1. Launch the "Configure HA Networking" wizard.

StarWind							8	🌲 🏠 admin 🕶
🙆 Dashboard	Network							
🛢 Storage 🔻		Configure HA networking						
Appliances	🗌 Interface ≑	Adapter model 🗢	Link status 💠	Bandwidth 🗘	MAC address 🗘	Role ≑	IP address 🗢	Appliance ≑
Appnances	🔲 📜 ens160	82574L Gigabit Net	Up		00:50:56:9C:E5:A5	Management		
Tasks and events	🔲 📜 ens160	82574L Gigabit Net				Management		
	🗌 📜 ens224	VMXNET3 Ethernet	Up			Unassigned		
	🗌 📜 ens224	VMXNET3 Ethernet				Unassigned		
	🗌 📜 ens256	VMXNET3 Ethernet	Down			Unassigned		
	🔲 📜 ens256	VMXNET3 Ethernet				Unassigned		
✓ Minimize								



2. Select appliances for network configuration.

NOTE: the number of appliances to select is limited by your license, so can be either two or three appliances at a time.

StarWind					🗐 🌲 🛟 admin 🔻
🙆 Dashboard	Configure HA networking				
 Storage Network Appliances 	Appliances Data network Replication perturnet	Appliances Select appliances for network configuration. Yo	u can configure up to three appliances at a time.		
💄 Users		Appliance 🗘	Status ≑	Adapters 🗢	
📋 Tasks and events 🛛 🔻		✓ SW1	Online		
		✓ SW2	Online		
				Close Next	
∢ Minimize					

3. Configure the "Data" network. Select interfaces to carry storage traffic, configure them with static IP addresses in unique networks, and specify subnet masks:

- assign and configure at least one interface on each node
- for redundant configuration, select two interfaces on each node
- ensure interfaces are connected to client hosts directly or through redundant switches

4. Assign MTU value to all selected network adapters, e.g. 1500 or 9000. Ensure the switches have the same MTU value set.



Star Hyperco	Wind Invergence										ŧ,	🗘 ac	dmin 🔻
		Configure HA networking											
		 ✓ Appliances Data network 	• Show	sample netw	ork diagram								
				Interface	Model	Bandwidth	MAC address	IP address	Netmask	Link status	SW		
					VMXNET3 Ethernet	10 Gbit	00:50:56:9C:21:E1			Up	SW		
					VMXNET3 Ethernet		00:50:56:9C:C4:73			Down	SW		
			i≣ SW2								SW		
			-	Interface	Model	Bandwidth	MAC address	IP address	Netmask ()	Link status	SW		
				ens224	VMXNET3 Ethernet	10 Gbit	00:50:56:9C:08:13	172.16.20.20		Down	511		
			Cluster M	ATU size:									
			мти 9000										
									Back	Next			

5. Click Next to validate Data network settings.

Star Wind		🗐 🌲 🏟 admin 🔻
	Image: Second state A Non-redundant configuration X 72.16.10.10 24 Vp ens	
	Only 1 Data network is configured. Configure more Data networks to eliminate a single point of failure	
	Inte We recommended assigning at least two data network Paddress Netmask © Link status interfaces to eliminate a single point of failure.	
	ens Acknowledge and continue? ens 72:16:00:20 24 Up	
	Cluster MTU s	
	k	

6. Configure the "Replication" network. Select interfaces to carry storage traffic, configure them with static IP addresses in unique networks, and specify subnet masks:

- assign and configure at least one interface on each node
- for redundant configuration, select two interfaces on each node



• ensure interfaces are connected to client hosts directly or through redundant switches

7. Assign MTU value to all selected network adapters, e.g. 1500 or 9000. Ensure the switches have the same MTU value set.

StarWind			
Dashboard Storage	Configure HA networking		
Appliances Users	Appliances Appliances Appliances Appliances Appliances Replication network	Select interfaces to carry data replication traffic, configure them with unique IP addresses, and specify subnet masks.	Q ≇ ··· Appliance ¢ SW1
📋 Tasks and events 🛛 🔻		Interface Model Bandwidth MAC address IP address Netmask O Link status ens256 VMXNET3 Ethermet 10 Gbit 0050569C.C4.73 172.16.20.10 24 Down	SW2 SW1 SW2
		Interface Model Bandwidth MAC address IP address Netmask ● Link status	SW1 SW2
		ens256 VMXNET3 Ethernet 10 Gbit 00:50:56:9C:91:2C 172.16.20.20 24 Down Cluster MTU size:	
		Back Not s	
< Minimize			

8. Click Next to validate the Replication network settings completion.

				🗉 🌲 🏟 admin 🔻
👜 Dashboard				
🗧 Storage 🔻				
Appliances				
Lusers				
📋 Tasks and events 🔻		▲ Non-redundant configuration ×		
		Only 1 Replication network is configured. Configure more Replication networks to eliminate a single point of failure.		
		interfaces to eliminate a single point of failure.		
		No, cancel Yer, continue		
< Minimize				



StarWind		
Dashboard		
Storage		
LUSERS		
	SW2 x Testing network settings Interface Model Bandwidth MAC address IP address Netmask O Link status	
< Minimize	k	

9. Review the summary and click Configure.

StarWind						E	🗐 🌲 🏟 admin 🕶	
🙆 Dashboard	Configure HA networking							
Storage •	 ✓ Appliances ✓ Data network 	Summary	Summary					
Appliances Users Tasks and events	 ✓ Replication network ● Summary 	Appliance name Data networks Replication networks	SW1 172.16.10.10 172.16.20.10					
		Appliance name Data networks Replication networks	₩ SW2 172.16.10.20 172.16.20.20					
					Back Cont	igure		
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Add Physical Disks

Attach physical storage to StarWind Virtual SAN Controller VM:

- Ensure that all physical drives are connected through an HBA or RAID controller.
- Deploy StarWind VSAN CVM on each server that will be used to configure faulttolerant standalone or highly available storage.
- Store StarWind VSAN CVM on a separate storage device accessible to the hypervisor host (e.g., SSD, HDD).
- Add HBA, RAID controllers, or NVMe SSD drives to StarWind CVM via a passthrough device.

Learn more about storage provisioning guidelines in the KB article.

Create Storage Pool

- 1. Click the "Add" button to create a storage pool.
- 2. Select two storage nodes to create a storage pool on them simultaneously.

StarWind		🗐 🌲 🏠 admin 🕶
🔹 Dashboard	Storage pools	
Storage File shares	Selected 0 of 0 + Create a new pool pool	
는 LUNs	There are no storage pools yet	
🕒 Volumes	Start building your storage infrastructure by creating a new one	
Storage pools		
Physical disks		
Annliances		
Lusers		
🗖 Tasks and events 🔻		
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StarWind hyperconvergence								E .	🤹 admin 👻
🕮 Dashboard	Stor	Create storage pool							
Storage *		Appliance Physical disks Benfile	Applia Select or	ance ne or more storage nodes to	o create a storage pool 😨				
C Volumes				Node name 🇢	Status \$	Available disks 🗢	Available capa 🗢		
Storage pools Physical disks				SW1	Online Online		15 GB		
🚆 Network									
Appliances Users									
📋 Tasks and events 📼									
						Cancel	Next		
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3. Select physical disks to include in the storage pool name and click the "Next" button. NOTE: Select identical type and number of disks on each storage node to create identical storage pools.

StarWind			🗐 🌲 🏠 admin 🔻
Dashboard	Stoi Create storage pool		
E LUNS	Selector Appliance Physical disks Profile	Physical disks Select physical disks to include in storage pools on each node O	
 Volumes Storage pools 		≣ SWI ▲ Disk name ◆ Mediat ◆ Bus pro ◆ Size ◆ Slot ◆ Contro ◆	
Physical disks		Image: solution of the sector of th	
E Appliances			
💼 Tasks and events 🛛 👻		 ■ Disk name	
		■ sdc HDD SAS 5 GB 32:0:2:0 SAS1068 PC	
		Selected number of disks is equal	
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4. Select one of the preconfigured storage profiles or create a redundancy layout for the new storage pool manually according to your redundancy, capacity, and performance requirements.



StarWind					🗐 🌲 💠 admin 💌
	Create storage pool				
	Appliance Physical disks Profile Summary	Profile Choose an optimal storage pool profile. Selected disks left unused will be assignted to the second	gned to hot spares.	Vetrosor	
		High capacity (recommended) Maunite redunding while maintaining high storage capacity (Sharma Kull/SRD 5)	1	- 0 +	
		High performance Maunitize storage performance while maintaining redundancy (Software RAID(RAID-1)			
		O Manual Allows you to configure the storage pool layout - manually.			
			Back	Next	

Hardware RAID, Linux Software RAID, and ZFS storage pools are supported and integrated into the StarWind CVM web interface. To make easier the storage pool configuration, the preconfigured storage profiles are provided to configure the recommended pool type and layout according to the direct-attached storage:

- hardware RAID configures Hardware RAID's virtual disk as a storage pool. It is available only if a hardware RAID controller is passed through to the CVM
- high performance creates Linux Software RAID-10 to maximize storage performance while maintaining redundancy
- high capacity creates Linux Software RAID-5 to maximize storage capacity while maintaining redundancy
- better redundancy creates ZFS Stripped RAID-Z2 (RAID 60)) to maximize redundancy while maintaining high storage capacity
- manual allows users to configure any storage pool type and layout with attached storage

5. Review "Summary" and click the "Create" button to create the pools on storage servers simultaneously.



Stol Create storage pool				
Scheeter V Appliance V Physical disks V Profile	Summary Review specified settings a ≌ SW1	nd create storage pools.		
• Summary	Storage pool layout Raw capacity Usable capacity			
	📑 SW2			
	Storage pool layout Raw capacity			
	Usable capacity		Back	

Create Volume

- 1. To create volumes, click the "Add" button.
- 2. Select two identical storage pools to create a volume simultaneously.



StarWind		🗉 🌲 🏟 admin 🕶
🔯 Dashboard	Volumes	
🛢 Storage 🔺	Selected 0 of 0 🕂 Create a new volume nage VHR user	
💻 File shares		
🞐 LUNs	There are no volumes yet	
🔮 Volumes	Start sharing your storage resources to clients by creating a new one	
III Storage pools		
Physical disks		
🏭 Network		
Appliances		
💄 Users		
🖹 Tasks and events 🔻		
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Volu Create volume						
Selected • Storage pool Settings Filesystem type	Select storage pool Select one or more (in HA configuration	ons) storage pools to cr	eate a volume €	Desilioncy A	Free 🚖	
	 Willing 0 SW2:md0 SW2:md0 	Software RAID	Online Online	RAID-5 RAID-5	9.98 GB 9.98 GB	
				Cancel	Next	

3. Specify volume name and capacity.



StarWind				🗉 🌲 🏠 admin 💌
	Voli Create volume			
	Select: V Storage pool Settings Filesystem type Summary	Specify settings Specify the volume name and size Name volume0 Vou can use Latin letters, numbers, and dash Sizer Sizer Available storage pool capacity \$ 38 GB		
			Back Next	
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4. Select the Standard volume type.

StarWind hyperconvergence			
😂 Dashboard	Voli Create volume		
 Fileshares UNis UNis Volumes Storage pools Physical disks Hetwork Appliances Users Tasks and events * 	Selector Storage pool Settings In Filesystem type Summary	Choose filesystem settings Choose the preferred filesystem settings for the new volume Image: Standard Back and the Standard Settings: Recommended for general use and the highest performance Image: Standard Back and the Standard Settings: Recommended for general use and the highest performance Image: Standard Back and the Standard Settings: Recommended for general use and the highest performance Image: Standard Back and the Standard Settings: Recommended for general use and the highest performance Image: Standard Back and the Standard Settings: Recommended for general use and the highest performance Image: Standard Back and the Standard Settings: Recommended for general use and the highest performance Image: Standard Back and the Standard Settings: Recommended for general use and the highest performance Image: Standard Back and the Standard Settings: Recommended for general use and the highest performance Image: Standard Back and the Standard Settings: Recommended for general use and the highest performance Image: Standard Back and the Standard Settings: Recommended for general use and the highest performance Image: Standard Back and the Standard Settings: Recommended for general use and the highest performance Image: Standard Back and the Standard Settings: Recommended for general use and the highest performance Image: Standard Back and the Standard Settings: Recommended for general use and the highest performance	
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5. Review "Summary" and click the "Create" button to create the pool.



Star Wind			🗉 🌲 🏟 admin 💌
	Volt Create volume		
	Selector Storage pool Settings Filesystem type	Review summary Review your settings before creating a volume	
	• Summary	Storage pool ESVIImd0 Volume name volume0 Size 5 G8 Filesystem settings Standard	
		≣ SW2	
		Storage pool 📑 SW2:md0 Volume name volume0 Size 5 GB Filesystem settings Standard	
		Back	

Create Ha Lun

The LUN availability for StarWind LUN can be Standalone and High availability (2-way or 3-way replication) and is narrowed by your license.

1. To create a virtual disk, click the Add button.



StarWind		e e	• •	admin 🔻	
🔯 Dashboard	LUNs				
Storage	Selected 0 of 0 🕂 🛃 Greate a new LUN				
E LUNS	There are no LUNs yet				
🔮 Volumes	Start sharing your storage resources to clients by creating a new one				
III Storage pools					
📕 Physical disks					
🚓 Network					
Appliances					
🛓 Users					
🖹 Tasks and events 🔻					
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2. Select the protocol.

	LUN Create LUN		
	Protocol Protocol Protocol LUN availability Select the required Protocol Appliances		
	Summary NVMe oF NVMe		
Appliances Users Tasks and events 🗢	ISC3 is a recommended protocol for most HDD based setup This option offers broader compatibility for storage clients.	, in medium performance SSD-based setups.	
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3. Choose the "High availability" LUN availability type.



StarWind			💼 🌲 🏟 admin 🝷
	LUN Create LUN		
	Selector • LUN availability Appliances Volumes Failover strategy LUN settings Summary	EUCH availability Setter the required LUN availability Image: signal control of the signal control	
		Back Next	
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4. Select the appliances that will host the LUN. Partner appliances must have identical hardware configurations, including CPU, RAM, storage, and networking.

StarWind hyperconvergence						🗉 🌲 🏠 admin 🔻
🚇 Dashboard	LUN Create LUN					
Storage * File shares ELUNS AND Volumes	Selecter Protocol LUN availability Appliances Notemage	Appliances Select two or three replication parts All appliances must have identica	ners that should host the	HA LUN s, including CPU, RAM, storage, and	networking	
 Storage pools Physical disks Network 	Failover strategy LUN settings Summary	Appliance	Status Online	Software version 1.5.460.5391+76fc51b	Capacity 15 GB	
 Appliances Users Tasks and events 		✓ E# SW2	Unline	1.5.460.5391+76(51D	12 GR	
				Back	Next	
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5. Select a volume to store the LUN data. Selected volumes must have identical storage configurations.



StarWind hyperconvergence			🖽 🌲 🎄 admin 🔻
	LUN Create LUN		
	Selector V Protocol LUN availability Appliances Volumes	Volumes Select one volume on each appliance to store the HA LUN data. Selected volumes must have identical storage configurations. Volumers have identical configurations	
	Failover strategy LUN settings Summary	Volume that a comparations If SW1 ▲ Volume State RAID Ie Capacity Free Sp Type	
		volume0 Mounted RAID-5 5 GB 4.92 GB Standard SW2	
		Volume ÷ State ÷ RAID le ¢ Capacity ÷ Free Sp ÷ Type ÷	
		Back	

6. Select the "Heartbeat" failover strategy.

NOTE: To use the Node witness or the File share witness failover strategies, the appliances should have these features licensed.

StarWind Hyperconvergence		🗉 🌲 🎝 admin 🔻
Dashboard	LUN Create LUN	
File shares	Protocol Failover strategy LUN availability Select the preferred failover strategy. The default is Appliances have a UPS unit at your disposal.	🔍 👳 🚥
 Volumes Storage pools Physical disks 	Volumes Failover strategy LUN settings LUN	artbeat" networks. Ing blackouts, configure UPS to prevent the simultaneous shutdown
 Network Appliances Users 	Summary Node witness Athind appliance acts as a "rooter" for replic The working witness node excludes the poss	
Tasks and events *		
		Back
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7. Specify the HA LUN settings, e.g. name, size, and block size. Click Next.



StarWind hyperconvergence			🗄 🌲 🏟 admin 🔻
	LUN Create LUN		
	Selecter	LUN settings Specify the HA LUN settings Lun name Lun0 Lun1 state Lun2 Austalable space: 4.92 GB Create VMFS6 datastore Create VMFS6 datastore GB Create VMFS6 datastore Appliance 110N Ing. 2008-08.com.starwindsoftware:192.168.12.206-lun0 Appliance 210N Ing. 2008-08.com.starwindsoftware:192.168.12.206-lun0 Appliance 210N Ing. 2008-08.com.starwindsoftware:192.168.12.166-lun0 Image: Allow multiple concurrent connections to ISCSI targets (MPIO)	
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8. Review "Summary" and click the "Create" button to create the LUN.

StarWind hyperconvergence				🖽 🌲 🏠 admin 🔻
🕮 Dashboard	Create LUN			
Storage File shares UNS UNS Volumes Storage pools File Storage pools	 Protocol LUN availability Appliances Volumes Failover strategy LUN settings Summary 	Summary Protocol UN availability Applance 1 Applance 2 Volume names Volume sizes Failover strategy UN name UN name UN name MPIO Create VMFS6 datastore IQNS	ISCSI High availability (two-way replication) SW1 SW2 volume0, volume0 SG8 Heartbeat Lun0 G0 Enabled Enabled Iqn_2008-08.com starwindsoftware:192.165.12.206-lun0 Iqn_2008-08.com starwindsoftware:192.165.12.206-lun0	
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Connecting Compute Nodes

To establish client connections to StarWind VSAN standalone and highly available storage devices (LUNs), follow these links for configuring settings on a hypervisor of your choice:

- VMware vSphere/ESXi Connecting StarWind LUNs to VMware vSphere servers
- Microsoft Hyper-V Connecting StarWind virtual disk to Hyper-V servers
- oVirt Provisioning StarWind HA Storage to Hosts
- Proxmox VE Connecting StarWind HA Storage to Proxmox Hosts

Conclusion

By following this guide, end-users can deploy StarWind Virtual SAN on commodity servers, configure highly available storage, and prepare it for client interconnections from compute (hypervisor) nodes. The guide provides key insights and steps to ensure a seamless deployment process.



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