

StarWind Virtual HCI Appliance: Configuration Guide for VMware vSphere [ESXi]

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TECHNICAL PAPERS





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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

StarWind Virtual HCI Appliance (VHCA)

Purpose

This document outlines how to configure a StarWind Virtual HCI Appliance (VHCA) based on VMware vSphere [ESXi], with VSAN running as a Controller Virtual Machine (CVM). The guide includes steps to prepare ESXi hosts for clustering, configure physical and virtual networking, and set up the Virtual SAN Controller Virtual Machine.

Audience

This technical guide is intended for storage and virtualization architects, system administrators, and partners designing virtualized environments using StarWind Virtual HCI Appliance (VHCA).

Expected result

The end result of following this guide will be a fully configured high-availability StarWind Virtual HCI Appliance (VHCA) powered by VMware vSphere [ESXi] that includes virtual machine shared storage provided by StarWind VSAN.

Prerequisites

Prior to configuring StarWind Virtual HCI Appliance (VHCA), please make sure that the system meets the requirements, which are available via the following link: https://www.starwindsoftware.com/system-requirements

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

Solution Diagram:





Prerequisites:

1. 2 servers with local storage, which have direct network connections for Synchronization and iSCSI/StarWind heartbeat traffic.

2. Servers should have local storage available for VMware vSphere [ESXi] and StarWind VSAN Controller Virtual Machine. CVM utilizes local storage to create replicated shared storage connected to VMware vSphere [ESXi] nodes via iSCSI.

3. StarWind HA devices require at least 2 separate network links between the nodes. The first one is used for iSCSI traffic, the second one is used for Synchronization traffic. Note. 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.

Hardware Configuration

Access the BIOS on each server:

1. Change "Boot mode select" to [UEFI]



S	System BIOS Settings • Boot Settings			
	Boot Mode	O BIOS O Enablec	 UEFI I o Disabled 	⊖ Reset
2	. Enable AC Power Recovery to On;			
	AC Power Recovery	o La	st 💿 On	O Off
(7)	8. Set System Profile Settings to Performance;			

System BIOS Settings • System Profile Settings	
System Profile	Performance

4. Disable Patrol Read in case of SSD disks;

RAID Controller in Slot 6: Dell PERC H750 Adapter Configuration Utility

Dashboard View • Main Menu • Patrol Read

Start			
Suspend			
Resume			
Stop			
State	Stopped		
Iterations	8		
Mode	⊖ Auto	 Manual 	Oisabled
Apply Changes			

5. Enable SR-IOV for network cards;

Integrated NIC 1 Port 1: Mellanox ConnectX-4 LX 25GbE SFP Rack NDC - 0C:42:A1:F3:FA:50

Main Configuration Page • Device Level Configuration

Virtualization Mode	⊖ None	SR-IOV
PCI Virtual Functions Advertised	8	

6. Configure the storage for OS and for data, or single RAID for OS and Data according to Supported RAID configurations here.



Settings for OS RAID1: Virtual disk name: OS Disk cache policy: Default (enabled by default) Write policy: Write Through Read policy: No read ahead Stripe Size: 64K

BOSS-S1 Configuration Utility • Create RAID Configuration Menu • Create Virtual Disk

RAID Level	RAID1
Stripe Size	● 64K
Virtual Disk Size	223GB
Quick Initialization	⊖ No lle Yes
Name	OS
Would you like to create this virtual disk?	O No le Yes
[Next]	

Storage for data:

Find supported RAID configurations for main data storage here.

Dashboard View • Main Menu • Virtual Disk Management

Virtual Disk 239: SSD-RAID5, RAID5, 8.729TB, Ready

Files For Starwind Vhci Configuration:

The StarWind files for vHCl configuration should be downloaded to Windows machine, which will be used for configuration. Run "StarWind Folders.ps1" script to form StarWind Files folder.

Structure of the StarWind Files folder: C:\StarWind Files C:\StarWind Files\ESXi Automatization configuration C:\StarWind Files\ISOs C:\StarWind Files\StarWindOVF



C:\StarWind Files\Temp

:) > StarWind Files >				
Name	Date modified	Туре		
ESXi Automatization configuration	1/31/2023 5:09 AM	File folder		
ISOs	1/27/2023 4:09 AM	File folder		
StarWindOVF	1/27/2023 5:04 AM	File folder		
Temp	2/7/2023 9:29 AM	File folder		

Scripts that are included in the "StarWind Folders.ps1" script. C:\StarWind Files\ESXi Automatization configuration\Esxi+configuration.ps1 C:\StarWind Files\Temp\ISOs Download.ps1 ISOs Download.ps1 allows to download the customized ISOs and OVF for vHCI configuration:

Windows 2019/2022 ESXi 7/8 / vCenter 7/8 StarWind VSAN for vSphere OVF The Esxi+configuration.ps1 allows performing the ESXi configuration.

Esxi Configuration Part:

Node 1

1. Start the "C:\StarWind Files\ESXi Automatization configuration\Esxi+configuration.ps1" with administrator rights.

 Installation of the components: Nuget provider
 PSGallery for Modules

 .net 3.5
 PowerCLI Module
 BitsTransfer Module



Installing NuGet package provider OK Allow to install modules from PSGallery to install powercli module OK Downloading .Net 3.5 framework OK Installing .Net 3.5 framework OK Check VMware PowerCLI module PowerCLI module is installed Welcome to VMware PowerCLI! Log in to a vCenter Server or ESX host: Connect-VIServer To find out what commands are available, type: Get-VICommand To show searchable help for all PowerCLI commands: Get-PowerCLIHelp Once you've connected, display all virtual machines: Get-VM If you need more help, visit the PowerCLI community: Get-PowerCLICommunity Copyright (C) VMware, Inc. All rights reserved.

3. ESXi server details:

IP address/user/password

Type IP address of the local ESXi server: 172.16.2.33 Type user of the local ESXi server: root Please enter your password: ************

4. Connection to the server

Connect ESXI server Perform operation? Performing operation 'Update PowerCLI configuration.'? [Y] Yes [A] Yes to All [N] No [L] No to All [5] Suspend [?] Help (default is "Y"): a WARNING: The Get-EsxCli cmdlet provides a new interface to the ESXCLI functionality. Use the -V2 parameter to switch to the new cmdlet interface. Check the cmdlet help for more information. Scripts that use the old cmdlet interface and will be removed in a future version.

Type "a" to perform the operation.

5. Choose [1] to change the ESXi server name:

Change ESXi Host Name Do you want to change the ESXi Host name? [y/n] : y Do you want a specific ESXi Host name? [y/n] : n Enter the Appliance type[]: Node1 (ESXi01)[1]; Node2 (ESXi02)[2]; Node3 (ESXi03)[3]; Backup (ESXi-BA)[4]; VTL (ESXi-VTL)[5]; : true

The specific name for ESXi could be set when you choose it:

Change ESX1 Host Name Do you want to change ESXi Host name? [y/n] : y Do you want a specific ESXi Host name ? [y/n] : y_

6. Set the 'CommunitySupported' level for ESXi and install VIBs.

Unange Lie acceptance (verb host acceptance level changed to 'CommunitySupported'. Who is the hardware vendor? Please specify [D] for Dell ESXI 7, [S] for SuperMicro ESXi 7, [D8] for Dell ESXi8, [S8] for SuperMicro ESXi8 or [none]: *_____



Message	: Operation finished successfully.
RebootRequired	: false
VIBsInstalled	: {DEL_bootbank_mrvl9230_1.0.13.1003-10EM.800.1.0.20143090}
VIBsRemoved	:
VIBsSkipped	:
Message	: Operation finished successfully.
RebootRequired	: false
VIBsInstalled	: {DEL_bootbank_racadm_11.0.0.0.5139-DEL.700.0.0.15843807}
VIBsRemoved	:
VIBsSkipped	:
Message	: Operation finished successfully.
RebootRequired	: false
VIBsInstalled	: {BCM_bootbank_vmware-perccli64-esxi8_007.2110.0000.0000-02}
VIBsRemoved	:
VIBsSkipped	:

7. Autostart for ESXi server and default NTP server

VMHost		Enabled	StartDelay	StopAction	StopDelay	WaitForHeartbeat
 HostSystem-ha- Set NTP serve Configure NTP pool.ntp.org	host r and start service	True it	120	GuestSh	120	False
VMHostId VMHost Name Enabled IncomingPorts OutgoingPorts Protocols ServiceRunning Uid ExtensionData	: HostSyst : 172.16.2 : NTP Clies : 123 : UDP : False : /VIServe : VMware.V	em-ha-hos .33 nt r=root@17 im.HostFi	t 2.16.2.33:44 rewallRuleso	43/VMHost=H et	ostSystem-h	a-host/VMHostFirewallException=NTP Client/
Key Label Policy Required Runeset Running Uninstallable VMHostId VMHost VMHostUid Uid ExtensionData	: ntpd : NTP Daemon : Off : False : {ntpClien : True : False : HostSyste : 172.16.2. : /VIServer : /VIServer : VMware.Vin	n m-ha-host 33 =root@172 m.HostSer	.16.2.33:44 .16.2.33:44 vice	3/VMHost=Ho 3/VMHost=Ho	st5ystem-ha st5ystem-ha	-host/ -host/HostService=ntpd/
Key Label Policy Required Ruleset Running Uninstallable WHHostId WHHostUid Uid ExtensionData	: ntpd : NTP Daemoi : automatic : False : {ntpClien : True : False : HostSyste : 172.16.2. : /VIServer : /VIServer : /VIServer : /VIServer	n t} 33 =root@172 =root@172 m.HostSer	.16.2.33:44 .16.2.33:44 vice	3/VMHost=Ho 3/VMHost=Ho	stSystem-ha stSystem-ha	-host/ -host/HostService=ntpd/

8. Choose network interfaces for iSCSI and Synchronization.

For 2 node configuration (1 iSCSI and 1 Sync) we need to choose iSCSI1 and Sync1 For 3 node configuration (2 iSCSI and 2 Sync) we need to choose iSCSI1, iSCSI2, and Sync1, Sync2



Name	: vmnic0
BitRatePerSec	: 25000
Mac	: 0c:42:a1:f3:fa:50
PciId	: 0000:19:00.0
Name	: vmnic1
BitRatePerSec	: 25000
Mac	: Oc:42:a1:f3:fa:51
PciId	: 0000:19:00.1
Name	: vmnic2
BitRatePerSec	: 10000
Mac	: b4:96:91:f2:fe:8c
PciId	: 0000:86:00.0
Name	: vmnic3
BitRatePerSec	: 0
Mac	: b4:96:91:f2:fe:8d
PciId	: 0000:86:00.1
Name	: vmnic4
BitRatePerSec	: 0
Mac	: b4:96:91:f2:fe:8e
PciId	: 0000:86:00.2
Name	: vmnic5
BitRatePerSec	: 0
Mac	: b4:96:91:f2:fe:8f
PciId	: 0000:86:00.3
Name	: vmk0
BitRatePerSec	:
Mac	: b4:96:91:f2:fe:8c
PciId	:
Choose NICs f	for iSCSI and Snchronization
Write name of	f the vmnic for iSCSI1 : vmnic0
Write name of	f the vmnic for iSCSI2 :
Write name of	f the vmnic for Sync1 : vmnic1
Write name of	f the vmnic for Sync2 :

9. The script will create vSwitches, VMKernel, and Port Groups with default StarWind names if you did not

choose the 'specific ESXi vSwitch name'. When 'specific ESXi vSwitch name' is chosen, vSwitches,

VMKernel, Port Groups, and iSCSI discovery will need specific names and IP addresses.

Do you want a specific ESXi vSwitch names ? [y/n] : y_



Do you want a spec	ific ESXi vSwitch names ? [y/n] : n
Creating vSwitches	S
Creating vSwitche	vSwitch-iSCSI-1-2
Id	: key-vim.host.VirtualSwitch-vSwitch-iSCSI-1-2
Key	: key-vim.host.VirtualSwitch-vSwitch-iSCSI-1-2
Name	: vSwitch-iSCSI-1-2
NumPorts	: 9216
NumPortsAvailable	: 9204
Nic	: {vmnic0}
Mtu	: 9000
VMHostId	: HostSystem-ha-host
VMHost	: 172.16.2.31
VMHostUid	: /VIServer=root@172.16.2.31:443/VMHost=HostSystem-ha-host/
Uid	: /VIServer=root@172.16.2.31:443/VMHost=HostSystem-ha-host/VirtualSwitch=key-vim.host.VirtualSwitch-vSwitch-iSCSI-1-2/
ExtensionData	: Wwware.Vim.HostVirtualSwitch
Creating vSwitche	vSwitch-Svnc-1-2
Td	kev-vim host VirtualSwitch-vSwitch-Svnc-1-2
Kev	kev-vim.host.VirtualSwitch-vSwitch-Svnc-1-2
Name	: vSwitch-Sync-1-2
NumPorts	9216
NumPortsAvailable	9202
Nic	{vmnic1}
Mtu	9000
VMHostId	HostSvstem-ha-host
VMHost	: 172.16.2.31
VMHostUid	: //TServer=root@172.16.2.31:443/WHHost=HostSvstem-ha-host/
Uid	: /VIServer=root@172.16.2.31:443/VMHost=HostSvstem-ha-host/VirtualSwitch=kev-vim.host.VirtualSwitch-vSwitch-Svnc-1-2/
ExtensionData	: VMware.Vim.HostVirtualSwitch

10. VMKernel will be created automatically in case of default names.

VMotionEnabled	: True
FaultToleranceLoggingEnabled	: False
ManagementTrafficEnabled	: False
IPv6	: {fe80::250:56ff:fe6e:a18b/64}
AutomaticIPv6	: False
IPv6ThroughDhcp	: False
IPv6Enabled	: False
Mtu	: 9000
VsanTrafficEnabled	: False
PortGroupName	: iSCSI-1-2
Id	: key-vim.host.VirtualNic-vmk1
VMHostId	: HostSystem-ha-host
VMHost	: 172.16.2.31
VMHostUid	: /VIServer=root@172.16.2.31:443/VMHost=HostSystem-ha-host/
DeviceName	: vmk1
Mac	: 00 <u>:</u> 50:56:6e:a1:8b
DhcpEnabled	: False
IP	: 172.16.10.249
SubnetMask	: 255.255.2
Uid	: /VIServer=root@172.16.2.31:443/VMHost=HostSystem-ha-host/HostVMKernelVirtualNic=key-vim.host.VirtualNic-vmk1/
Name	: vmk1
ExtensionData	: VMware.Vim.HostVirtualNic

11.Port Groups will be created automatically in case of default names.



12. iSCSI initiator and iSCSI discovery IP addresses will be created automatically in case of default names.



WHost FileSystemVolumeInfo SoftwareIScsiEnabled ScsiLun Id WHostId Uid ExtensionData Name	: 17 {d Tr : {m Ho Ho VM	<pre>?2.16.2.31 datatore1, OSDATA-6411c3Oa-049f29d0-f38f-b49691f2fe8c, BOOTBANK1, BOOTBANK2} "ue "ue" "ue" "ue" "ue" "ue" "ue" "ue"</pre>
Address Port IScsiHbaKey AuthenticationPropert Type Uida ElesiHbaName ExtensionData ExtensionData VaHostId HostStorageSystemId	ies	: 172.16.10.1 : 3260 : kg-vrim.host.InternetScsiHba-vmhba64 : Gng:Proibited : Gend ver-root8172.16.2.31:443/WHost=HostSystem-ha-host/Hba=key-vim.host.InternetScsiHba-vmhba64/IScsiHbaTarget=172.16.10.1:3260:Send/ : 101.1938-01.com.ymware:esxi01.g53703096:64 : HostSystem-ha-host : HostSystem-ha-host
Address Port IScsiHbaKey AuthenticationPropert Uid Name IScsiHbaName ExtensionData VmHostId HostStorageSystemId	ies	: 172.16.10.2 ; 3260 : key-vim.host.InternetScsiHba-vmhba64 : Send : Send : Vilserver-root8172.16.2.31:443/WHost=HostSystem-ha-host/Hba=key-vim.host.InternetScsiHba-vmhba64/IScsiHbaTarget=172.16.10.2:3260:Send/ : 37.16.98.01.com.wmaretesxi01:653703096:64 : MWare.Vim.HostInternetScSiHbaSendTarget : MostSystem-ha-host : MostSystem-ha-host

13. StarWind ESXi user for ProActive monitoring creation.



14. StarWind Virtual Machine installation. Choose "I" for StarWind Virtual SAN (vSAN) for vSphere.

It is possible to change the default ESXi name by specifying a name for Virtual Machine.





Proceed to configure the f	following parameters of the virtual machine with name $(SW-HCA-VM-01)^2$
New NumCourt 8	or towing parameters of the virtual mathine with name Swinck-ve-or ?
[V] Vec [A] Vec to A]] [NJ No [1] No to All [5] Suspend [2] Help (default is "V"), a
WARNING. The 'Version' pro	ng No [2] No to Ari [3] Suspend [3] help (default is 1), a
ARMING. THE VEISION PIC	perty of virtualmachine type is depretated. Use the naruwareversion property instead.
PowerState .	PoweredOff
Version ·	
HardwareVersion	-10
Notes .	StarWind Virtual SAN for VSnhere
Guest .	Summa virtual salvis visine s
NumCou	
ConesDerSocket	
Memory/MR	+ 8102
Memory/GB	8 0172
VMHostTd	HostSvstem_ha_host
VMHost ·	172 16 2 33
VAnn	1/2.10.2.35
FolderId	Folder-ba-folder-vm
Folder	
ResourcePoolId	ResourcePool-ba-root-pool
ResourcePool	
PersistentId	526h4488-0410-739c-a2h9-c9e0h3a79687
lisedSnaceGR	16 00008087605237960815429688
ProvisionedSnaceGB	16 003803573001954326620638672
DatastoreIdList	Datastorpe_641_c3db7_60d58d0a_d8d0_b49691f2fe8c}
HARestartPriority	
HATsolationResponse	
DrsAutomationLevel :	
VMSwapfilePolicy :	Inherit
VMResourceConfiguration :	CnuShares:Normal/8000 MemShares:Normal/81920
GuestId	The IT A Guiest
CreateDate	3/23/2023 12:23:18 PM
SEVEnabled	
Name	SW-HCA-VM-01
CustomEields	
ExtensionData :	Www.Vim.VirtualMachine
Id :	VirtualMachine-1
Uid	/VIServer=root@172.16.2.33:443/VirtualMachine=VirtualMachine=1/
Recerve RAM for VM	
Type : Task	
Value : haTask-1-vim.Virtu	alMachine.reconfigure-130
Autostart for VM	
WARNING: The 'VirtualMachi	neId' property of VMStartPolicy type is deprecated. Use the 'VMId' property instead.
VirtualMachineId	: VirtualMachine-1
VMId	: VirtualMachine-1
VM	: SW-HCA-VM-01
VirtualMachineName	: SW-HCA-VM-01
VmHostId	: HostSystem-ha-host
StartAction	: PowerOn
StartDelay	: 120
StartOrder	:1
StopAction	: GuestShutdown
StopDelay	: 120
WaitForHeartbeat	: False
IsStartDelayInherited	: True
IsStopActionInherited	: False
IsStopDelayInherited	: True
IsWaitForHeartbeatInherite	d : True
Uid	: /VIServer=root@172.16.2.33:443/VMHost=HostSystem-ha-host/VMStartPolicy=VirtualMachine-1/
ExtensionData	: VMware.Vim.AutoStartPowerInfo

Note: OVF will be downloaded if it is not present. CPU and RAM memory will be configured according to our best practices. Storage drives for StarWind devices should be added manually.

Node 2

1. Start the "C:\StarWind Files\ESXi Automatization configuration\Esxi+configuration.ps1" with administrator rights.

2. Installation of the components:Nuget providerPSGallery for Modules.net 3.5PowerCLI ModuleBitsTransfer Module



Installing NuGet package provider OK Allow to install modules from PSGallery to install po Downloading .Net 3.5 framework OK Installing .Net 3.5 framework OK Check VMware PowerCLI module PowerCLI module is installed Update PowerCLI module Welcome to VMware PowerCLI!	wercli module OK	
Log in to a vCenter Server or ESX host: To find out what commands are available, type: To show searchable help for all PowerCLI commands: Once you've connected, display all virtual machines: If you need more help, visit the PowerCLI community:	Connect-VIServer Get-VICommand Get-PowerCLIHelp Get-VM Get-PowerCLICommunity	
Copyright (C) VMware, Inc. All rights reserved		
Import-Module BitsTransfer		

- 3. ESXi server details:
- IP address/user/password

Import-Module BitsTransfer Type IP address of the local ESXi server: 172.16.2.31 Type user of the local ESXi server: root Please enter your password: ************

4. Connection to the server

Connect ESXI server Perform operation? Performing operation 'Update PowerCLI configuration.'? [Y] Yes [A] Yes to All [N] No [L] No to All [S] Suspend [?] Help (default is "Y"): a Type "a" to perform the operation.

5. Changing the ESXi server name: We need to choose [2]

```
Change ESX1 Host Name
Do you want to change ESXi Host name? [y/n] : y
Do you want a specific ESXi Host name ? [y/n] : n
Enter the Applience type: Node1 [1]; Node2 [2]; Node3 [3]; Backup [4]; VTL [5]; : 2
true
```

The specific name for ESXi could be set when you choose it:

Change ESX1 Host Name Do you want to change ESXi Host name? [y/n] : y Do you want a specific ESXi Host name ? [y/n] : y_

6. Set the 'CommunitySupported' level for ESXi and install VIBs.

Host acceptance level changed to 'CommunitySupported'. Who is the hardware vendor? Please specify [D] for Dell ESXI 7, [S] for SuperMicro ESXi 7, [D8] for Dell ESXi8, [58] for SuperMicro ESXi8 or [none]: _



Message	: Operation finished successfully.
RebootRequired	: false
VIBsInstalled	: {DEL_bootbank_mrv19230_1.0.13.1003-10EM.800.1.0.20143090}
VIBsRemoved	:
VIBsSkipped	:
Message	: Operation finished successfully.
RebootRequired	: false
VIBsInstalled	: {DEL_bootbank_racadm_11.0.0.0.5139-DEL.700.0.0.15843807}
VIBsRemoved	:
VIBsSkipped	:
Message	: Operation finished successfully.
RebootRequired	: false
VIBsInstalled	: {BCM_bootbank_vmware-perccli64-esxi8_007.2110.0000.0000-02}
VIBsRemoved	:
VIBsSkipped	:

7. Autostart for ESXi server and default NTP server

VMHostId	: HostSystem-ha-host	
VMHostUid	: /VIServer=root@172.16.2.31:443/VMHost=HostSystem-ha-host/	
Enabled	: True	
StartDelav	: 120	
StopAction	: GuestShutdown	
StopDelav	: 120	
WaitForHearthea	at : False	
llid	 //IServer=root@172.16.2.31:443/VMHost=HostSvstem-ha-host/WHostStartPolicv=/ 	
ExtensionData	: Wwware.Vim.HostAutoStartManager	
Configure NTP s	service	
pool.ntp.org		
VMHostId	: HostSystem-ha-host	
VMHost	: 172.16.2.31	
Name	NTP Client	
Enabled		
IncominaPorts	•	
OutgoingPorts	173	
Protocols		
ServicePunning		
usid	. raise	ant /
ExtensionData	: VMware.Vim.HostFirewallRuleset	ent/
Key	, ntnd	
Labal	, NTO Deemon	
Dolicy		
Polity		
Required	[stalse	
Rulesel	True True	
Kunning :	: Irue	
uninstallable :	False	
VMHOSTIC	Hostsystem-na-nost	
VMHOST	1/2.16.2.31	
VMHostUld	/Viserver=root@1/2.16.2.31:443/WHOst=HostSystem-na-nost/	
U1d	/VIServer=root@1/2.16.2.31:443/VMHost=HostSystem-ha-host/HostService=htpd/	
ExtensionData :	: VMware.Vim.HostService	
Kev	: ntpd	
Lahel	NTP Daemon	
Policy		
Pequired		
Duleset	<pre> faise</pre>	
Dupping		
Uning		
MHostId	HartSystem by bost	
WHest		
WHOSE	1/2.10.2.31	
VMHOSTUID	//IServer=root@172.16.2.31:443/WHOst=HostSystem-ha-host/	
	/Viserver=rootwi/2.16.2.31:443/VMHost=HostSystem-ha-host/HostService=htpd/	
ExtensionData :	VMWare.VIM.HostService	

8. Choose network interfaces for iSCSI and Synchronization.

For 2 node configuration (1 iSCSI and 1 Sync) we need to choose iSCSI1 and Sync1 For 3 node configuration (2 iSCSI and 2 Sync) we need to choose iSCSI1, iSCSI2, and Sync1, Sync2



Nama		
Name RitDataDanSac		25,000
Mac		0 = 1 + 5 + 5 = 5 = 5 = 5 = 5 = 5 = 5 = 5 = 5
PriId		0000.19.00 0
FCIIU		0000.19.00.0
Name	:	vmnic1
BitRatePerSec		25000
Mac	:	0c:42:a1:f3:fa:51
PciId	:	0000:19:00.1
Name	•	vmnic2
BitRatePerSec	•	10000
Mac	•	b4:96:91:t2:te:8c
PC110	•	0000:86:00.0
Name	:	vmnic3
BitRatePerSec	÷	0
Mac	:	b4:96:91:f2:fe:8d
PciId	:	0000:86:00.1
Name	•	vmn1c4
BitRatePerSec	•	
Mac		04:96:91:T2:Te:8e
PC110	•	0000:86:00.2
Name		vmnic5
BitRatePerSec		0
Mac	:	b4:96:91:f2:fe:8f
PciId	:	0000:86:00.3
Name		VMKU
BitkatePerSec	2	h4.06.01.f2.fo.8c
Pritd		D4:90:91:12:10:0C
rentu		
Choose NICs f	For	iSCSI and Snchronization
Write name of	= t	he vmnic for iSCSI1 : vmnic0
Write name of	= t	he vmnic for iSCSI2 :
Write name of	t	he vmnic for Sync1 : vmnic1
Write name of	t	he vmnic for Sync2 :

9. The script will create vSwitches, VMKernel, and Port Groups with default StarWind names if you did not

choose the 'specific ESXi vSwitch name'. When 'specific ESXi vSwitch name' is chosen vSwitches,

VMKernel, Port Groups, and iSCSI discovery will need specific names and IP addresses.

Do you want a specific ESXi vSwitch names ? [y/n] : y_



Do you want specif Creation vSwitche Creating vSwitche	רב ESX1 vSwitch names? [y/n] : n יי vSwitch-iSCSI-2-1
Id	: key-vim.host.VirtualSwitch-vSwitch-iSCSI-2-1
Key	: key-vim.host.VirtualSwitch-vSwitch-iSCSI-2-1
Name	: vSwitch-iSCSI-2-1
NumPorts	: 9216
NumPortsAvailable	: 9204
Nic	: {vmnic0}
Mtu	: 9000
VMHostId	: HostSystem-ha-host
VMHost	: 172.16.2.33
VMHostUid	: /VIServer=root@172.16.2.33:443/VMHost=HostSystem-ha-host/
Uid	: /VIServer=root@172.16.2.33:443/VMHost=HostSystem-ha-host/VirtualSwitch=key-vim.host.VirtualSwitch-vSwitch-iSCSI-2-1/
ExtensionData	: VMware.Vim.HostVirtualSwitch
Creating vSwitche	vSwitch-Sync-2-1
Id	: key-vim.host.VirtualSwitch-vSwitch-Sync-2-1
Key	: key-vim.host.VirtualSwitch-vSwitch-Sync-2-1
Name	: vSwitch-Sync-2-1
NumPorts	: 9216
NumPortsAvailable	: 9202
Nic	: {vmnic1}
Mtu	: 9000
VMHostId	: HostSystem-ha-host
VMHost	: 172.16.2.33
VMHostUid	: /VIServer=root@172.16.2.33:443/VMHost=HostSystem-ha-host/
Uid	: /VIServer=root@172.16.2.33:443/VMHost=HostSystem-ha-host/VirtualSwitch=key-vim.host.VirtualSwitch-vSwitch-Sync-2-1/
ExtensionData	: VMware.Vim.HostVirtualSwitch

10. VMKernel will be created automatically in case of default names.

Creation VMKernel	
Creation VMKernel WotionEnabled FaultToleranceLoggingEnabled IPv6 AutomaticIPv6 IPv6ThroughDhcp IPv6Enabled Mtu VsanTrafficEnabled PortGroupName Id WHHostId WHHostJid	: True : False : False : False : False : False : False : Source : So
Mac DhcpEnabled IP SubnetMask Uid Name ExtensionData	. VMLT : OO:50:56:6b:06:ee : False : 172.16.10.250 : 255.255.255.26 : /VIServer=root@172.16.2.33:443/WH0st=HostSystem-ha-host/HostVMKernelVirtualNic=key-vim.host.VirtualNic-vmk1/ : vmk1 : vmk1 : VMware.Vim.HostVirtualNic

11. Port Groups will be created automatically in case of default names.



12. iSCSI initiator and iSCSI discovery IP addresses will be created automatically in case of default names.



Enable iSCSI initiator WARNING: The 'ScsiLun'	property of WHostStorageInfo type is deprecated. Use 'Get-ScsiLun' cmdlet instead.
WHost : 1: FileSystemVolumeInfo : { SoftwareIScsiEnable : { IsoftwareIScsiEnable : { Id : H WHostId : H Uid : // ExtensionData : / Name :	r2,16.2,33 distatore1, OSDNTA-64123db7-32d243e-231d-b49691f2fe8c, BOOTBANK1, BOOTBANK2) rg0 rg0 rg0 rg0 rg0 rg0 rg0 rg0 rg0 rg0
Address Port IScsiHbaKey AuthenticationProperties Und Und EsceiHbaName ExtensionData WeihosIId HostStorageSystemId	: 122.164.0.1 2360 : Key-vin.host.Internet5csiHba-vmhba64 : GhapProhibited : Gend ere-wool8172.16.2.33:443/WHost=HostSystem-ha-host/Hba=key-vin.host.Internet5csiHba-vmhba64/I5csiHbaTarget=172.16.10.1:3260:5end/ : 172.36.10.1:3260 : 108.1938-01.com.vmmar:esxi01:1937441933:64 : MostTors.argetsystem-shoagedSystem
Address Port ScsiHbaKey AuthenticationProperties Vid Name EScsiHohame EScsiHohame ExtensionData WeHosIId HostStonageSystemId	: 172.16.10.2 : 126. : ChapProhibited : Send : VIServer-root8172.16.2.33:443/WHost=HostSystem-ha-host/Hba=key-vim.host.InternetScsiHba-vmhba64/IScsiHbaTarget=172.16.10.2:3260:Send/ : 172.16.10.2:3260 : 172.16.10.2:3260 : VMarez_Vim.hostInternetScsiHbaSendTarget : MostSUrgetSystem-StargeSystem : MostSUrgetSystem-StargeSystem

13. StarWind ESXi user for ProActive monitoring creation.

Create ESXi Us	ser	· / Role / Permission
Description		StarWind
IsSystem		False
PrivilegeList		{Global.CancelTask, Global.CapacityPlanning, Global.Diagnostics, Global.DisableMethods}
ServerId		/VIServer=root@172.16.2.31:443/
Server		172.16.2.31
Id		10
Name		StarWind
Uid		/VIServer=root@172.16.2.31:443/Role=10/
ExtensionData		VMware.Vim.AuthorizationRole

14. StarWind Virtual Machine installation. Choose "I" for StarWind Virtual SAN (vSAN) for vSphere

You can specify the specific name for Virtual Machine in case of not default ESXi name.

Set name for StarWind VM ESXi02 StarWind VM Creation Choose type of the StarWind W Windows[w] / Linux [1] : 1 StarWind OVF exist MARNING: The size of the file 'StarWindVSA_vSphere_20211124_14398-disk1.vmdk' is 2019257856 bytes where 2188326400 bytes is expected. Confirm Are you sure you want to perform this action? Performing the operation "Setting NetworkName: iSCSI-2-1-for-VMs" on target "Network adapter 2". [Y] Yes [A] Yes to All [N] No [L] No to All [S] Suspend [?] Help (default is "Y"): a Confirm Are you sure you want to perform this action? Performing the operation "Setting NetworkName: Sync-2-1-for-VMs" on target "Network adapter 3". [Y] Yes [A] Yes to All [N] No [L] No to All [S] Suspend [?] Help (default is "Y"): a



Proceed to configure the f	following parameters of the virtual machine with name 'SW-HCA-VM-02'?
New NumCou: 8	or fouring parameters of the official materiale with name on new vision
[Y] Yes [A] Yes to All [N] No [1] No to All [5] Suspend [7] Help (default is "Y"): a
WARNING: The 'Version' pro	perty of VirtualMachine type is deprecated. Use the 'HardwareVersion' property instead.
PowerState :	PoweredOff
Version :	v10
HardwareVersion :	vmx-10
Notes :	StarWind Virtual SAN for vSphere
Guest :	SW-HCA-VM-02:
NumCpu :	8
CoresPerSocket :	4
MemoryMB :	8192
MemoryGB :	8
VMHostId :	HostSystem-ha-host
VMHost :	172.16.2.33
VApp :	
FolderId :	Folder-ha-folder-vm
Folder :	Vm
ResourcePoolId :	ResourcePool-ha-root-pool
ResourcePool :	Resources
PersistentId :	5270c85c-73d7-5195-42fb-6e19d06aea2d
UsedSpaceGB :	16.000008087605237960815429688
ProvisionedSpaceGB :	16.993893573991954326629638672
DatastoreIdList :	{Datastore-641c3db7-60d58d0a-d8d0-b49691†2†e8c}
HARestartPriority :	
HAIsolationResponse :	
DrsAutomationLevel :	
VMSwapfilePolicy :	Inherit
VMResourceConfiguration :	Cpushares:Norma1/8000 MemShares:Norma1/81920
GuestId :	rhel/_64Guest
CreateDate :	3/23/2023 12:42:13 PM
SEVENABLED :	False
Name :	SW-HCA-VM-02
CUSTOMFIEIDS :	Utere Vir Visterlus-Mise
ExtensionData :	VMware.VM.virtualMachine
	VITEuaImachine-Z
	/VIServer=rooter/2.10.2.55:445/VirtualMathine=VirtualMathine=2/
Pacanua RAM for M	
Recerve RAM for VM	
Type · Tack	
Value • baTask_2_vim Vintu	alMachine reconfigure-319
value . Halask-2-vill.ville	
Autostart for VM	
WARNING: The 'VirtualMachi	ineId' property of VMStartPolicy type is deprecated. Use the 'VMId' property instead
ARALING: THE VITERALMACH	inclus property of white efforted type is depretated. Use the white property instead.
VirtualMachineId	: VirtualMachine-2
MTd	: VirtualMachine-2
VM	: SW-HCA-VM-02
VirtualMachineName	: SW-HCA-VM-02
VmHostId	: Host5vstem-ha-host
StartAction	: PowerÓn
StartDelay	: 120
StartOrder	: 1
StopAction	: GuestShutdown
StopDelay	: 120
WaitForHeartbeat	: False
IsStartDelayInherited	: True
IsStopActionInherited	: False
IsStopDelayInherited	: True
IsWaitForHeartbeatInherite	ed : True
Uid	: /VIServer=root@172.16.2.33:443/VMHost=HostSystem-ha-host/VMStartPolicy=VirtualMachine-2/
ExtensionData	: VMware.Vim.AutoStartPowerInfo

Note: OVF will be downloaded if it is not present. CPU and RAM memory will be configured according to our best practices.

Storage drives for StarWind devices should be added manually.

Storage Configuration Part

Three options to add storage for StarWind VM:

VMDK when ESXI is located on the same RAID array with DATA.

RDM when ESXI RAID array and DATA RAID array are located on the same RAID Controller,

PCI when servers have two RAID controllers one for ESXi and the second for DATA or HBA physical disks.



VDMK

1. Add the new standard hard disk to StarWind VM from the existing datastore:

Bedit settings - SW-HCA-VM-01 (ESXi 5.5 virtual machine)				
Virtual Hardware VM Options				
Add hard disk	k adapter 🛛 🗊 Add other device			
Existing hard disk	8 ~ 0		_	
 New persistent memory disk New raw disk 	8 GB *		×	
	LSI Logic SAS	~		
> 🔆 SCSI Controller 0			×	
 SATA Controller 0 Sata Controller 1 	VM Network	✓ ✓ Connect	×	
> 🖕 Network Adapter 2	iSCSI-1-2-for-VMs	✓ Connect	×	
> 🛱 Network Adapter 3	Sync-1-2-for-VMs	✓ Connect	×	
> 🕲 CD/DVD Drive 1		~	×	
	Specify custom settings	~		
		CANCEL	SAVE	

2. Specify the size and type of the new hard disk.

The type of Disk Provisioning should be Thick Provision Eager Zeroed

∼ 🖨 New Hard disk	* GB ~	×
Maximum Size	77.84 GB	
Location	[datastore1] SW-HCA-VM-01/	
Disk Provisioning	 Thin provisioned Thick provisioned, lazily zeroed Thick provisioned, eagerly zeroed 	
Shares	Normal V 1000 V	
Limit - IOPs	Unlimited	

3. Modify the StarWind VM file to resolve the issue with ESXI: VMware Knowledge Base



Edit and save the VMX file of the StarWind VM by adding the following lines:

```
scsi0.async = "FALSE"
scsi0:0.canBlock = "TRUE"
scsi0:1.canBlock = "TRUE"
Line 1 shall be introduced for every SCSI controller your VM has got (0, 1, or whatever its
number is). Line 2 shall be introduced for every port on that controller (here is why we
use line 3 - just for example purposes in case of two disks attached to the VM using 1
SCSI controller).
In this example, VM got one SCSI adapter and two disks assigned to it.
```

RDM

1. Add the new raw disk to StarWind VM.

irtual Hardware VM Options	•					
🔁 Add hard disk 🛛 🚊 Add net	work adapter	🔝 Add	other device			
New standard hard disk	8 4	0				
Existing hard disk						
New persistent memory disk	8	GB				
P New raw disk	16	GB	~			×
SCSI Controller 0	LSI Logic s	SAS		Ť.		
D SATA Controller 0						×
Network Adapter 1	VM Netwo	ork		~ 🗸	Connect	×
🛱 Network Adapter 2	iSCSI-1-2-f	or-VMs		~ 🗹	Connect	×
🛱 Network Adapter 3	Sync-1-2-f	or-VMs		~ 🗹	Connect	×
S CD/DVD Drive 1				~		×
Video Card	Specify cu	stom settings	5	~		

2. Select the RAID array for StarWind devices



E Select a storage device	
Name	Capacity ~
Local DELL Disk (naa.6f4ee0803e09c6002b5d2341f23ad1df)	8.73 TB
	1 items
	CANCEL

PCI

1. Open ESXI web \rightarrow Manage \rightarrow Hardware \rightarrow PCI Devices. Find the RAID Controller or HBA disks.

☆ Navigator ≪	ESXi01 - Manage				
V 🗄 Host	System Hardware Licensing	Packages Services Security & users			
Manage					
Monitor	PCI Devices	🌣 Toggle passthrough 🕜 Configure SR-IOV 🕜 Hardware label 🦓 Reboot host C Refresh			Q PERC X
Virtual Machines	Power Management	Address 💽 Description	SR-IOV	Passthrough	Hardware Label
V B SW-HCA-VM-01		O00018.00.0 Broadcom / LSI PERC H750 Adapter	Not capable	Disabled	
Monitor More VMs		Ouick filters v			1 items

2. Toggle passthrough for the RAID Controller or HBA disks, and refresh a page.

☆ Navigator 《	ESXi01 - Manage			
V 🗄 Host	System Hardware Licensing	Packages Services Security & users		
Manage				
Monitor	PCI Devices	🌣 Toggle passthrough 🕜 Configure SR-IOV 🔗 Hardware label 🦓 Reboot host 🕴 😋 Refresh		Q perd ×
V 🖓 Virtual Machines 🚺	Power Management	Address Description	SR-IOV	Passthrough 💭 Hardware Label 👽
V B SW-HCA-VM-01		0000:18:00.0 Broadcom / LSI PERC H750 Adapter	Not capable	Enabled / Needs reboot
Monitor Mare VMs		Quick filters v		1 items

- 3. Reboot the ESXi server.
- 4. Add PCI devices to StarWind VM.



irtual Hardware VM Optio	ons			
🖨 Add hard disk 🛛 🚊 Add r	network adapter	Add other device		
CPU	8 4	💿 CD/DVD drive		
		📙 Floppy drive		
memory	0,	📼 Serial port		
Hard disk 1	16	🗇 Parallel port		×
	L SLL onic S	🚓 USB controller		
SCSI Controller 0	Loi Logic o	🔗 USB device		
📼 SATA Controller 0		く) Sound controller		×
🗒 Network Adapter 1	VM Networ	PCI device	- Connect	×
To Notwork Adaptor 2	iccel 1.2.5	😰 Dynamic PCI d PCI device	Connect	~
, Network Adapter 2	13031-1-2-10	SCSI controller	Connect	^
🛱 Network Adapter 3	Sync-1-2-fo	📴 SATA controller	🖌 🗹 Connect	×
🕤 🚱 CD/DVD Drive 1			~	×
	Specify cus	tom settings	~	



🚍 Add hard disk 🛛 🖳 Add netv	vork adapter 🛛 🔢 Add other device		
CPU	8 ~ 🕄		
I Memory	8 GB ~		
🖨 Hard disk 1	16 GB ~		>
♦ SCSI Controller 0	LSI Logic SAS	~	
🖾 SATA Controller 0			>
🔄 Network Adapter 1	VM Network	✓ Connect	>
🔄 Network Adapter 2	iSCSI-1-2-for-VMs	✓ Connect	>
🔄 Network Adapter 3	Sync-1-2-for-VMs	✓ Connect	>
S CD/DVD Drive 1		~	>
🖵 Video Card	Specify custom settings	~	
New PCI device	PERC H750 Adapter - 0000:18:00.0	~	>

5. Save the configuration.

Starwind Configuration Part

To manage StarWind service you need to download and install 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 installer available here. NOTE: StarWind Management Console and PowerShell Management Library components are required.

2. 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 I	HELP			
Refresh Connect Disconnect Add Se	ver 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			
	٢			>
StarWind Software Ready				

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

📑 Add new Star	?	×	
Host: 127.0.0.1		: 3261	
Advanced >>	ОК	Cano	cel

5. Select the server and click Connect.



StarWind Manag	gement Console
IF FF DO T BF 4D A3 EE D CC1	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

- 6. Click Apply Key... on the pop-up window.
- 7. Select Load license from the 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 -	o x
<u>File Edit View Tools Debug A</u> dd-ons <u>H</u> elp	
	-
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	
8 \$server = New-SWServer -host 127.0.0.1 -port 3261 -user root -password starwind	
9 10 trv	
11 E{	
12 Server.Connect()	
14 Get-SWLicense \$server	
16 Remove-SWLicense \$server	
17 18 #apply license key	
19 Set-SWLicense \$server "C:\License\licensekey.swk"	
20 Li catch	
22 ⊡{ 23 Write-Host \$foreground red	
24 }	
25 Finally 26 ⊟{	
27 Sserver.Disconnect() 28 }	
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.

Configure Starwind Vm

Names:

 To log in to the StarWind VSAN VM web console you need to type the VM IP address and port 9090
 Example: 192.168.1.1:9090
 The default credentials:
 Login: user
 Password: rds123RDS



StarWind	Virtual SAN	1
Cherry St.		
User name	user	Server: starwindvsa-59030629
Password		Log in with your server user account.
All A	Reuse my password for privileged tasks	Constant Parks
	Log In	

2. On the "System" page click on the "Host Name" and change it according to the default StarWind names or a specific name.

STARWIND VIRTUAL SAN								ileged 💄 user 🗸
🗐 starwindysa-59	Hardware VMware, Inc. VMwa	re Virtual Platform	% of 8 CPU cores					
	Asset Tag VMware-56 4d 25 9	e e8 66 db 25-86 b3 cc fb 0b 18 22 d6	100					
System	Machine ID 7efc955712a8470at	3ba9d8079c7aeae3	50					
Lors	Operating System CentOS Linux 7 (Con	re)						
			0 18:29	18:30	18:31	18:32		18:33
Storage	Secure Shell Keys Show fingerprints		GiB Memory & Swap					
Networking	Host Name starwindvsa-590306	9999	6					
Accounts	Domain Join Domain		4					
Services	Power Ontions Restart	,	2					
	Performance Profile none		18:29	18:30	18:31	18:32	18:33	
Terminal		M	ie/s Disk I/O					
			3					
		0.5	500					
			18-29	18-30	18-91	18-92		18-93
		R	800 Network Traffic					
			100					
			0 18:29	18:30	18:31	18:32		18:33
0195								
Chang	ge Host Nam	e						
Pretty	/ Host Name	SW-HCA-VM	1-01					
Rea	l Host Name	sw-hca-vm-(01					

Networks:

1. To log in to the StarWind VSAN VM web console you need to type the VM IP address and port $9090\,$

Cancel

Change



Example: 192.168.1.1:9090 The default credentials: Login: user Password: rds123RDS

StarWind	Virtual SAN	1.
1 the part		
User name	user	Server: starwindvsa-59030629
Password		Log in with your server user account.
HC .	Reuse my password for privileged tasks Log In	

2. On the "Networking" page click on the "ens192" to set the management IP-address. "ens224" – is for iSCSI and should have the following IP-address 172.16.10*/24 "ens256" – is for Synchronization and should have following IP-address 172.16.20*/24

3. iSCSI and Synchronization networks should have the following settings: Node 1: iSCSI 172.16.10.1/24

IPv4 Settings	
Addresses	Manual ~ 🕇
172.16.10.1 24	Gateway –
DNS	Automatic +
DNS Search Domains	Automatic +
Routes	Automatic +
	Cancel Apply

IPv6 should be disabled and MTU set to 9000.



en224 VM/were VMXXET3 Ethernet Controller vmtnetal 00.00C29:18:22E0	
Status 172.16.10.1/24	
Carrier 10 Gbps	
General Connect automatically	
IPv4 Address 172.16.10.1/24	
IPv6 (gnore	
MTU 9000	

Synchronization 172.16.20.1/24

IPv4 Settings	
Addresses	Manual v 🕇
172.16.20.1 24	Gateway
DNS	Automatic +
DNS Search Domains	Automatic +
Routes	Automatic 💽 🕂
	Cancel Apply

IPv6 should be disabled and MTU set to 9000.



Node 2: iSCSI 172.16.10.2/24



IPv4 Settings		
Addresses	Manual 🗸	+
172.16.10.2	24 Gateway -	-
DNS	Automatic	+
DNS Search Domains	Automatic	+
Routes	Automatic	+
	Cancel App	ly

IPv6 should be disabled and MTU set to 9000.



Synchronization 172.16.20.2/24



IPv4 Settings	
Addresses	Manual 🗸 🕂
172.16.20.2 24	Gateway
DNS	Automatic +
DNS Search Domains	Automatic +
Routes	Automatic +
	Cancel Apply

IPv6 should be disabled and MTU set to 9000.



Storage:

Single disk based on hardware:

 Login to StarWind VSAN VM web console and find in the Storage section under Drives the Disk that was recently added and choose it.
 Note: To log in to the StarWind VSAN VM web console you need to type the VM IP address and port 9090
 Example: 192.168.1.1:9090
 The default credentials:
 Login: user
 Password: rds123RDS



User name user Password Passwo	User name user Password Reuse my password for privileged tasks Log in with your server to be the server	ndvsa-590306 • server user acc • set up as RAD	ver: starwind ; in with your se exces No storage set	Serv Log i	Log In			NEW WRITE	eged tasks	word for privile	user	me us rd … ≥
Password Password Reuse my password for privileged tasks Log in with your server user Log in	Password Reuse my password for privileged tasks Log in with your server to Reuse my password for privileged tasks Log in Ruber my password for privileged tasks Log in Ruber my password for privileged tasks Ruber my password for privileged	e set up as RAID	evices	Log i	Log In			KEY, Writing	eged tasks	word for privile	Reuse my password	rd
		e set up as RAID	evices No storage set	RAID Dev	Log In			NEW Writing	eged tasks	word for privile	Reuse my password	
annotation 2.9.2. Realing annotation 2.9.2. No intercept on the in	Arron Conservation and an and and	e set up as RAID	evices No storage set	RAID Devi				NEW Writing				
Image: Second	Amount Paint Size Size </th <th>je set up as RAID</th> <th>No storage set</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>8</th> <th>NB/s Reading</th>	je set up as RAID	No storage set								8	NB/s Reading
32 32 <td< td=""><td>32 12.4 12.43 12.43 12.43 12.43 12.43 12.44 12.45 12.44 12.45 12.44 12.45 12.44 12.45 12.44 12.45 12.44 12.45 12.44 12.45 12.44 12.</td><td></td><td></td><td></td><td></td><td></td><td></td><td>64</td><td></td><td></td><td></td><td>64</td></td<>	32 12.4 12.43 12.43 12.43 12.43 12.43 12.44 12.45 12.44 12.45 12.44 12.45 12.44 12.45 12.44 12.45 12.44 12.45 12.44 12.45 12.44 12.							64				64
File Title <	Name Mount Palmit Size Size<		e Groups	Volume G	10.15	10.11	10-10	J22	10.12	10.15	10.10	82 0
Secure Marce Moure Point Size Marce Moure Solice Marce Moure Solice	Serverne Moure Apoint Size Moure Apoint Size Moure Apoint Moure Apoint Apoint		centos 15.0 GIB	10.40	10.40	10.00	10.43	10.42	10.40	16.45	10.40 10.44	10.42
Name Name Name Name Name Idev/sensitions / Idev/sensitions Idev/sensitions Idev/sensitions Idev/sensitions / Idev/sensitions Idev/sensitions Idev/sensitions Storage logs Idev/sensitions Idev/sensitions Idev/sensitions Idev/sensitions Name 52 2023 Idev/sensitions Idev/sensitions Idex/sensitions Idex/sensitions Idev/sensitions Idex/sensitions Idex/sensitions Idex/sensitions Idex/sensitions Idex/sensitions Idex/sensitions Idex/sensitions Idex/sensitions Idex/sensitions	Name Name Name Name Name Name 1319 Logistic turity/1 unjet class 'lutisationation/get' has no property name 'physical-volume' utisate 1		wices	VDO Decis					P=-	1-2	s Marrier Balan	Filesystems
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KIODS HIODS	19/20 a phart patient size 'UDirici (our) ad(a)Uduma@datt' har as assand 'Unical unituma' united at the second size of the seco	e Disk	8.73 TiB Solid-State Disk	21	udisksd			k-lvm2'	o property named 'bloc'	LinuxBlockObject' has no	g_object_noti+y: object class 'UDiskSLinuxBl g_object_notify: object class 'UDiskSLinuxBl	18:39 g_object_no
18:39 g_object_notify: object class 'UDisksLinuxLogicalVolumeObject' has no property named 'logical-volume' udisksd 23	20.59 g_ospec_locaty: object cases objected monopect may no property many appearance object to an object cases	2	NODIS MODIS	2.9	udisksd			ed 'logical-volume'	t' has no property name	LinuxLogicalVolumeObject'	g_object_notify: object class 'UDisksLinuxLo	18:39 g_object_no
Line Contral Line A	18:39 g_odject_notify: ddject class '00isk00jectSk2ieton' has no property named 'manager-lwd' udikkd R. 0.01, WO DFs	5	R: 0 B/s W: 0 B/s		udisksd			r-1vm2'	property named 'manager	ObjectSkeleton' has no pr	g_object_notify: object class 'UDisksObjectS	18:39 g_object_no

2. The added disk does not have any partitions and filesystem.

Press on Create Partition Table button to create the partition and format it.

Erase	Don't overwrite existing data	~
Partitioning	Compatible with modern system and hard disks > 2TB (GPT)	~

Formatting a disk will erase all data on it.



Press on Format button to create the partition and format it.

3. Press on Create Partition button to create the partition and format it.

Create the XFS partition. Specify the name and erase option. The mount point should be as following: /mnt/sw . Click Create Partition.



Create Partitio	n on /dev/sdb
Size	8939 GiB ~
Erase	Don't overwrite existing data v
Туре	XFS - Recommended default ~
Name	*
	Encrypt data
Mounting	Custom ~
Mount Point	/mnt/sw
Mount Options	✔ Mount at boot
	Mount read only
	Custom mount options
	Cancel Create Partition

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

Storage > DELL PERC H750 Adp (0091021 de99a245d2b00f4093e80e04e)		
Drive		
Model PERC H750 Adp Firmware Version 5.21 Serial Number 00910216499a245d2b00H093e80e6He World Wide Name 0x644ee0093a6914002b5d249ae91d0291 Capacity 8.73 R18, 660 T8, 959850817520 byres		
Device File /dev/sdb		
Content		Create Partition Table
✓ 8.73 TIB xfs File System	/dev/sdb1	
Partition Filesystem		Delete Format
Name * Mount Point /mnt/sw Mount Mount Options defaults Used -		
✓ 8.73 TIB xfs File System	/dev/sdb1	
Partition Filesystem		Delete
Name *		
Mount Point /md/Sw Mount Options defaults Mounted At /mn/Sw Unmount		
Used 33.5 MiB of 8,73 TIB		



5. Connect to StarWind Virtual SAN from the StarWind Management Console. Click Yes.



6. Select the disk which was recently mounted.

Open					×
👔 Back 🝌 New Folder 🗙	Delete				
VSA Storage	Nam	ne	Size There are no items	Date to show.	Attributes
File name:				~	Open Cancel

Several disks for Software RAID:

 Login to StarWind VSAN VM web console and find in the Storage section under Drives the Virtual Disk that was recently added and choose it.
 Note: To log in to the StarWind VSAN VM web console you need to type the VM IP address and port 9090 Example: 192.168.1.1:9090 The default credentials: Login: user Password: rds123RDS



Sta	rWind Virt	ual SAN	1 0
1 des			
User	name use	r	Server: starwindvsa-59030629
Passw	vord ····		Log in with your server user account.
at le	F	teuse my password for privileged tasks	

2. Go to the Storage page. The Drives section shows the drives connected to HBA/RAID Controller (if available).

					—	15.0 GIB
Filesystems						
Name	Mount Point	Size			VDO Devi	ices 🛃 🛨
/dev/centos/root	1			3.16 / 13.4 GIB		No storage set up as VDO
/dev/sda1	/boot			158 / 1014 MiB	Drives	
Storage Logs						VMware Virtual disk 16 GiB Hard Disk
18:47 Cleaning up mount point /mnt/sw (device 8:17 is not mounted) udisksd						R: 0 B/s W: -8.21 B/s
18:45 Mounted /dev/sdb1 (system) at /mnt/sw on behalf of uid 1002 udisksd						VMware Virtual SATA CDRW Drive (0000
18:25 g_object_notify: obje	ct class 'UDisksLinuxBlockOb	ject' has no property named 'physical-volume'	udisksd		64	Optical Drive
18:25 g_object_notify: obje	ct class 'UDisksLinuxBlockOb	udisksd	2 >		R: 0 B/s W: 0 B/s	
18:25 g_object_notify: obje	ct class 'UDisksLinuxLogical	udisksd	2 🕨		HFS1T9G32FEH-BA10A (KN08N7077I020	
18:25 g_object_notify: object class 'UDisksLinuxVolumeGroupObject' has no property named 'volume-group' udisksd					00	1.75 TiB Solid-State Disk
18:25 g_object_notify: obje	ct class 'UDisksObjectSkelet	udisksd			R: 0 B/s W: 0 B/s	
18:25 g_object_notify: obje	ct class 'UDisksObjectSkelet	on' has no property named 'manager-iscsi-initiator'	udisksd			HFS1T9G32FEH-BA10A (KNA6N7867I300 1.75 TiB Solid-State Disk
18:25 Loading module libudi	sks2_lvm2.so		udisksd		62	
18:25 Loading module libudi	:25 Loading module libudisks2_iscsi.so					R: 0 B/s W: 0 B/s
					[©]	HFS1T9G32FEH-BA10A (KSACN81461020 1.75 TiB Solid-State Disk R: 0 B/s W: 0 B/s
						HFS1T9G32FEH-BA10A (KNA6N7867I300 1.75 TiB Solid-State Disk R: 0 B/s W: 0 B/s

3. Click "+" in the RAID Devices section to create Software RAID. (In the current example, RAID 10 will be created with 4 HDD drives). StarWind recommendations of RAID configurations depending 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		


StarWind Software RAID recommended settings can be found here: Recommended RAID settings for HDD and SSD disks – StarWind Knowledge Base

4. Select the drives to add to the array.

D Device	
RAID5	
RAID 5 (Distributed Parity)	~
512 KiB	~
1.75 TiB HFS1T9G32FEH-BA10A (KNA6N7867I300774S)	/dev/sdc
1.75 TiB HFS1T9G32FEH-BA10A (KSACN8146I020CV3G)	/dev/sdd
1.75 TiB HFS1T9G32FEH-BA10A (KNA6N7867I300773B)	/dev/sde
 1.75 TiB unpartitioned space on HFS1T9G32FEH-BA10A (KN08N7077l0208L4U) 	/dev/sdb
	Cancel Create
	P Device RAID5 RAID 5 (Distributed Parity) 512 KiB I.75 TiB HFS1T9G32FEH-BA10A (KNA6N7867I300774S) I.75 TiB HFS1T9G32FEH-BA10A (KSACN8146l020CV3G) I.75 TiB HFS1T9G32FEH-BA10A (KNA6N7867I300773B) I.75 TiB HFS1T9G32FEH-BA10A (KNA6N7867I300773B) I.75 TiB unpartitioned space on HFS1T9G32FEH-BA10A (KN08N7077I0208L4U)

5. After the synchronization is finished, find the RAID array created.





Storage > RAIDS					
RAID Device RAID5				Stop	Delete
Device /dev/md/RAID5 UUID c0x3a0b3.45Mdb3072e10bcf3c64e38f Capacity 3.49 TI6, 3.84 TB, 3840495582323 bytes RAID Level RAID 5, 3 Disks, 512 KB Chunk Stee Bitmap					
Content		Create Partition Table	Disks	0 UEC1T0C22EEU.D4104 (VNA6N7967)2007745)	+
✓ 3.49 TiB Unrecognized Data	/dev/md/RAID5		2	In Sync	-
Unrecognized Data		Format	2	1 HFS1T9G32FEH-BA10A (KSACN8146I020CV3G) In Sync	-
Usage - Type -			0	2 HFS1T9G32FEH-BA10A (KNA6N7867I300773B) In Sync	-

NOTE: The disk created will not have any partitions and file system. Click Format.

6. Create the XFS partition. Mount point should be as follows: /mnt/sw. Select the Custom mounting option and type noatime. Click Format.

Format /dev/m	d/RAID5		
Erase	Don't overwrite existing da	ta	~
Туре	XFS - Recommended defaul	lt	~
Name	RAID5		
	Encrypt data		
Mounting	Custom		~
Mount Point	/mnt/sw		
Mount Options	🗹 Mount at boot		
	Mount read only		
	Custom mount options	noatime]
		Formatting a storage dev	vice will erase all data on it.
			Cancel Format

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



Storage > RAIDS				
RAID Device RAID5			Stop	Delete
Device /dev/md/RAIDS UUID ck3abb3474408507240 (bcf/dc64e38f Capacity 3.49 Till, 3.84 Till, 3840495583232 bytes RAID Lever RAID State Bitmap Col State Running				
Content		Create Partition Table	Disks 0 HF51T9G32FEH-BA10A (KNA6N7867I3007745)	+
✓ 3.49 TiB xfs File System	/dev/md/RAID5		In Sync 1 HFS1T9G32FEH-BA10A (KSACN81460020CV3G)	-
Filesystem Name RAIDS		Format	In Sync In Sync 2 HF51T9G32FEH-BA10A (KNA6N7867/300773B)	-
Mount Point /mn/tsw Mount Mount Options noatime Used -			in sync	
Storage > RNDS RAID Device RAIDS			Stop	Delete
Device /devind/RAD5 UUID c0x3a0b345/4db30/72c10bcf3c64e38f Capacity 3.49 TIB, 3.84 TIB, 340495583323 bytes RAID Level RAD5, 3. Disks, 512 KIB Chunk Size Bitmag Capacity				
State Running				
Content		Create Partition Table	Disks 0 HFS1T9G32FEH-BA10A (KNA6N7867/3007745)	+
✓ 3.49 TIB xfs File System	/dev/md/RAID5		In Sync	
Filesystem		Format		-
Name R4I05 Mount Polint //mnt/sw Mount Options noatime			In Sync	-
Mounted At /mnt/sw Unmount Used 33.9 MIB of 3.49 TIB				

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

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

9. Select the disk recently mounted.



💿 Open				×
👔 Back 🝌 New Folder 🚬 Delete				
VSA Storage media v immt sw	Name	Size There are no items	Date to show.	Attributes
File name:			 Op	en Cancel

Starwind Devices Creation

For VMware the default number of StarWind devices is two DS1 and DS2.

1. In the StarWind Management Console click on to Add Device (advanced) button and open Add Device (advanced) Wizard.



StarWin	id Managemer	t Console										- 🗆 X
FILE HO	TARGET	OPTIONS HELP										
Refresh C	onnect Disco	nnect Add Server Remov	Server Add Device A	dd Device (advanced) Ad	d VTL Device	Remove T	arget Help					
🖌 🚺 Ser	vers		Gen	eral Configuration	CHAP Per	missions	Access Rights	Server Log	Events	Performance		
ti ti	← Add Select	Device Wizard Device Type you war	nt to create or expo	ort as iSCSI Target	? ×):326 <u>ver</u> 🞸	1 Add Target o	Add Device	,≓ Add [Device (advanced)	금 Add Control Device	Target Groups Manager
	•	Hard Disk Device Tape Device Optical Disc Drive				72.16.2.36 72.16.2.36 261 asic	<u>1ation</u>					
	0					ogged-in irtual SAN nlimited fo nlimited	or single Node Dev	ices				
				Next	Cancel							
						L						

2. Select Hard Disk Device as the type of device to be created.

			?	×	l
\leftarrow	Add [Device Wizard			
	Select I	Device Type you want to create or export as iSCSI Target			1
	۲	Hard Disk Device			
	0	Tape Device			
	0	Optical Disc Drive			
		Next	Can	icel	

3. Select Virtual Disk.



			?		×
←	Add [Device Wizard			
	Select I	Disk Device Type			
	۲	Virtual Disk Virtual Disk stores User Data in File			
	0	Physical Disk Export existing physical Disk as iSCSI Target			
	0	RAM Disk Virtual Disk with Memory Storage			
		Ne	ext	Cancel	

4. Specify a virtual disk Name, Location, and Size.

The size should be 1GB to do a quick synchronization.



?	\times	ſ
		(
~		
Can	cel	
	?	? ×

5. Select the Thick provisioned disk type and block size.

NOTE: Use 4096 sector size for targets, connected on Windows-based systems and 512 bytes sector size for targets, connected on Linux-based systems (ESXi/Xen/KVM).



		?	×
←	Add Device Wizard		
	Virtual Disk Options		
	Thick-provisioned		
	O Thick-provisioned with Log-structured Write-Back Cache (experimental)		
	OLSFS		
	Deduplication		
	StarPack Cache Size: 16 MB \checkmark		
	Block Size 💿 Use 512 bytes sector size		
	Ouse 4096 bytes sector size. May be incompatible with some clients		
	Next	Can	cel

6. Define a caching policy and specify a cache size (in MB). Also, the maximum available cache size can be specified by selecting the appropriate checkbox. Optionally, define the L2 caching policy and cache size.



			?	×
←	Add De	vice Wizard		
	Specify [Device RAM Cache Parameters		
	Mode			
	0	Write-Back Writes are performed asynchronously, actual Writes to Disk are delayed, Reads are cached		
	0	Write-Through Writes are performed synchronously, Reads are cached		
	۲	N/A Reads and Writes are not cached		
	Set M	laximum available Size		
	Size:	128 MB ~		
		Next	Cano	el:



			?	×	ľ
÷	Add Device V	Vizard			
	Specify Flash	n Cache Parameters			I
	No Flash C	ache			
	O Use Flash	Cache			
	Name:	Flash-DS1			
	Location	N: VSA Storage\mnt\			
	Size:	1 GB 🗸			
		Next	Can	cel	

7. Specify Target Parameters. Select the Target Name checkbox to enter a custom target name. Otherwise, the name is generated automatically in accordance with the specified target alias.



		?	×
_	Add Davids Winard		
~	Add Device Wizard		
	Target Parameters		
	Choose a Target Attachment Method		
	Create new Target	~	+
	Target Alias		_
	DS1		
	Target Name		
	ign.2008-08.com.starwindsoftware:DS1-SW-VM-01		
	Allow multiple concurrent iSCSI Connections		
	Next	Car	ncel

8. Click Create to add a new device and attach it to the target.



7	2	×
Create	Cancel	
	Create	? : Create Cancel

9. Click Close to finish the device creation.



		?	×
÷	Add Device Wizard		
	Device Creation completed		1
	Following Device was created		
	• imagefile 1		
	Target Name: iqn.2008-08.com.starwindsoftware:ds1-sw-vm-01		
		0	
	Close	Car	icel

10. The successfully added devices appear in the StarWind Management Console.



11. Click on to Add Device (advanced) button and open Add Device (advanced) Wizard.



Datwind Management Console PLet WOST TARGET OPTIONS HELP Referent Connect Disconnect Add Server Remove Sarver Add Device (advanced). Add VTU Device Remove Target Help Cervers: General Configuration CH40P Permissions Access Rights Serve Log Events Performance 7 X Add Device Wiard 1): 3261 Select Device Type you want to create or export as iSCSI Target Bind Disk Device Target Device 31 3264 Nett Optical Disc Drive Nett Careet										_
FLE HOST TARGET OPTIONS HELP Refrech Connect Decomet Add Server Remove Server Add Device Add Device Remove Target Help Ceneral Configuration CHAP Permissions Access Rights Server Log Events Performance ? × Add Device Wizard): 32611 Ver	StarWind Management Console									
Refrech Connect Disconnect Add Server Remove Server Add Device (advanced) Add VIL Device Remove Target Hip Cenvers General Configuration CHAP Permissions Access Rights Server Log Events Performance Add Device Wizard Select Device Type you want to create or export as iSCSI Target Wer (* Add Target (* Add Device (advanced) (* Add Control Device (* Target Groups Manager Hinformation 2:16.2.36 2:16	FILE HOST TARGET OPTIONS HELP									
Image: Server Log General Configuration CHAP Permissions Access Rights Server Log Events Performance Add Device Witard Select Device Type you want to create or export as ISCSI Target Hard Disk Device Tape Device Optical Disc Drive Tape Device Optical Disc Drive Test Tape Device Net 	resh Connect Disconnect Add Server Remove Server Add Device (advanced) Help									
 Add Device Ward Select Device Type you want to create or export as iSCSI Target Hard Disk Device Tape Device Optical Disc Drive 	Servers	General Configuration	CHAP Permissions	Access Rights	Server Log	Events	Performance			
 Add Device Wizard Select Device Type you want to create or export as iSCSI Target Hard Disk Device Tape Device Optical Disc Drive Potical Disc Drive Next Cancel 	E9	?	×							4
Select Device Type you want to create or export as iSCSI Target	▲ 🚰 ← Add Device Wizard): 326	1						
Hard Disk Device T2.16.2.36 T2.16.2.36 T2.16.2.36 Z1.62.36	Select Device Type you want to create or	export as iSCSI Target	rver 🗳	Add Target a	Add Device	러 Add D	evice (advanced)	Add Control Device	Target Groups Manager	
Tape Device 261 Optical Disc Drive asic Image: Disc Drive orgetein Image: Disc Drive regetein Image: Disc Drive orgetein Image: Disc Disc Drive orgetein Image: Disc Disc Disc Disc Disc Disc Disc Disc	Hard Disk Device		72.16.2.36							
O Optical Disc Drive asic ogget in rigget in itrual SAN hlimited for single Node Devices hlimited			72.16.2.36							
ogged-in irtual SAN nimited for single Node Devices nimited Next Cancel			asic							
irtual SAN Inlimited for single Node Devices Inlimited	Optical Disc Drive		ogged-in							ľ
nlimited for single Node Devices			irtual SAN							
Nest Cancel			Inlimited fo	r single Node Devic	es					Ē
Nex Cancel			mimited							ľ
Nex Cancel										
Net Cancel										
Net										ĥ
Next										
Net Cancel										ł
		Next	Cancel							
										ł
										ľ
StarWind Software Ready	StarWind Software Ready									-

12. Select Hard Disk Device as the type of device to be created.

			?	×
÷	Add [Device Wizard		
	Select I	Device Type you want to create or export as iSCSI Target		
	۲	Hard Disk Device		
	0	Tape Device		
	0	Optical Disc Drive		
		Next	Can	cel

13. Select Virtual Disk.



			?	>	<	
←	Add D	Device Wizard				
	Select [Disk Device Type				(
	۲	Virtual Disk				
	0	Physical Disk				
		Export existing physical Disk as iSCSI Target				
	0	RAM Disk				
		Virtual Disk with Memory Storage				
					_	
		Next	(Cancel		

14. Specify a virtual disk Name, Location, and Size. The size should be 1GB to do a quick synchronization.



					Ъ
			?	\times	r
←	Add Device	Wizard			ľ
	Virtual Disk	Location			
	Create a	lew Virtual Disk			Ì
	Name:	DS2			
	Locatio	n: VSA Storage\mnt\sw\			
	Size:	1 GB ~			
	OUse an Ex	isting Virtual Disk			
	Locatio	n:	~		
	Rea	d-Only Mode			
		Next	Can	cel	

15. Select the Thick provisioned disk type and block size.

NOTE: Use 4096 sector size for targets, connected on Windows-based systems and 512 bytes sector size for targets, connected on Linux-based systems (ESXi/Xen/KVM).



		?	×
←	Add Device Wizard		
	Virtual Disk Options		
	Thick-provisioned		
	O Thick-provisioned with Log-structured Write-Back Cache (experimental)		
	○ LSFS		
	Deduplication		
	StarPack Cache Size: 16 MB \sim		
	Block Size 💿 Use 512 bytes sector size		
	◯ Use 4096 bytes sector size. May be incompatible with some clients		
	Next	Can	cel

16. Define a caching policy and specify a cache size (in MB). Also, the maximum available cache size can be specified by selecting the appropriate checkbox. Optionally, define the L2 caching policy and cache size.



			?	×
←	Add De	vice Wizard		
	Specify [Device RAM Cache Parameters		
	Mode			
	0	Write-Back Writes are performed asynchronously, actual Writes to Disk are delayed, Reads are cached		
	0	Write-Through Writes are performed synchronously, Reads are cached		
	۲	N/A Reads and Writes are not cached		
	Set M	laximum available Size		
	Size:	128 MB ~		
		Next	Cano	el:



			?	×
←	Add Device Wizar	ł		
	Specify Flash Ca	che Parameters		l
	No Flash Cache			
	OUse Flash Cache	•		
	Name:	Flash-DS1		
	Location:	VSA Storage\mnt\		
	Size:	1 GB ~		
		Next	Can	cel

17. Specify Target Parameters. Select the Target Name checkbox to enter a custom target name. Otherwise, the name is generated automatically in accordance with the specified target alias.



	?	×
← Add Device Wizard		
Target Parameters		
Choose a Target Attachment Method		
Create new Target	~	
Target Alias		_
D52]
☑ Target Name		
ign.2008-08.com.starwindsoftware:ds-sw-vm-01]
Allow multiple concurrent iSCSI Connections		
	Next Can	cel

18. Click Create to add a new device and attach it to the target.



			?	×
←	Add Device Wizard			
	Creation Page			
	Press "Create" to add new Device and attach it to new Target			
	Progress			
	Creating Device Folder			
	Creating Image File			
	Creating Header			
	Creating Device			
	Creating Target and attaching Device			
		Create	Can	cel

19. Click Close to finish the device creation.



		?	×
~	Add Device Wizard		
	Device Creation completed		
	Following Device was created		
	• imagefile2		
	Target Name: iqn.2008-08.com.starwindsoftware:ds-sw-vm-01		
	Close	Can	cel

20. The successfully added devices appear in the StarWind Management Console.

4 📑 172.16.2.36 (172.16.2.36) : 3261
4 🔷 DS1
imagefile1
▲ 🔶 DS2
imagefile2

Starwind Replication Of Devices

The replication should be configured using Synchronous "Two-Way" Replication mode: Synchronous or active-active replication ensures real-time synchronization and load balancing of data between two or three cluster nodes. Such a configuration tolerates the failure of two out of three storage nodes and enables the creation of an effective business continuity plan. With synchronous mirroring, each write operation requires control confirmation from both storage nodes. It guarantees the reliability of data transfers but is demanding in bandwidth since mirroring will not work on high-latency networks.

1. Right-click on the DS1 device and select Replication Manager from the shortcut menu.

	IMAGEFILE1	Force remove Device 음* Attach to Target 암 Detach from ign.2008-08.com.starwindsoftware:ds1-sw-vm-01 택 Replication Manager
	ons dsoftware:ds1-sw-vm-01	imagefile1 VSA Storage\mnt\sw\DS1\DS1.img Yes 1 GB
🕏 Extend Image Size ह्ये Replication Manager	Senal Id Asynchronous Mode CACHE	512 Bytes No B0169ABD02D647EB Yes
	Mode	N/A

2. Select the Add Replica button in the top menu.

Refresh Add Replica Remove Replication Partner Click to add replication partner Click to add replication partner PROPERTIES Host Name Target Name Mode Priority Synchronization Status Synchronization Channel	😴 Replication Manager for imagefile1	?	×
Replication Partner Click to add replication partner PROPERTIES Host Name Target Name Mode Priority Synchronization Status Synchronization Channel	Refresh Add Replica Remove Replica		
Click to add replication partner	Replication Partner		
PROPERTIES Host Name Target Name Mode Priority Synchronization Status Synchronization Channel	Click to add replication partner		
PROPERTIES Host Name Target Name Mode Priority Synchronization Status Synchronization Channel			
PROPERTIES Host Name Target Name Mode Priority Synchronization Status Synchronization Channel			
PROPERTIES Host Name Target Name Mode Priority Synchronization Status Synchronization Channel			
PROPERTIES Host Name Target Name Mode Priority Synchronization Status Synchronization Channel			
Host Name Target Name Mode Priority Synchronization Status Synchronization Channel	PROPERTIES		
Target Name Mode Priority Synchronization Status Synchronization Channel	Host Name		
Mode Priority Synchronization Status Synchronization Channel	Target Name		
Priority Synchronization Status Synchronization Channel	Mode		
Synchronization Status Synchronization Channel	Priority		
Synchronization Channel	Synchronization Status		
Close	Synchronization Channel		
Close			
Close			
		Clo	se

3. Select Synchronous "Two-Way" replication as a replication mode.



	1	?	×
~	Replication Wizard		
	Replication Mode		
	Synchronous "Two-Way" Replication Replication Partner must be connected to Client as Source Device as well, MPIO on (must be enabled, needs dedicated high Performance Network Connection for Synchronization.	Client	
	Witness Node Witness node doesn't contain user data. In case when Node Majority policy is set fo Synchronous replication device and there are two storage nodes, Witness Node mus added to cluster to make number of nodes odd number and enable proper functionin Node Majority policy.	r st be ng of	
	Next	Canc	el

4. Specify a partner Host name or IP address and Port Number.



		?	×
- Keplication Wizard			
Add Partner Node			
Specify Partner Host Name or IP Address where Replication Node would b	e created		
Host Name or IP Address	r		
Port Number 3261			
Γ	Next	Cano	el:

5. Select Failover Strategy.



			?	×
÷	Replic	cation Wizard		
	F 1			
	Fallove	er Strategy		
	۲	Heartbeat Process node and communication failures using additional communication channel (heartbeat). At least one synchronization or heartbeat channel must be functional proper failover processing. Loss of all communication channels may lead to split bra issue, so it's recommended to use client iSCSI connection interfaces as heartbeat channel.	for ain	
	0	Node Majority Process node and communication failures using majority policy: node stays active w sees more than half of nodes including itself. In case of 2 storage nodes, requires configuring additional witness node. Does not require additional heartbeat channel	vhile it	
		Next	Canc	el

6. Select Create new Partner Device and click Next.



			?	×
←	Repli	cation Wizard		
	Partnei	r Device Setup		
	۲	Create new Partner Device Existing Device Parameters would be used as a Template.		
	0	Select existing Device Select existing Device on Partner Server.		
		Next	Can	cel

7. Select a partner device Location and click Next.



		?	×
←	Replication Wizard		
	Partner Device Setup		
	Location: VSA Storage\mnt\sw\		
	iqn.2008-08.com.starwindsoftware:ds1-sw-vm-01		
	Modify Target Name		
	Next	Canc	el

8. Select Synchronization Journal Strategy and click Next.

NOTE: There are several options – RAM-based journal (default) and Disk-based journal with failure and continuous strategy, that allow to avoid full synchronization cases.

RAM-based (default) synchronization journal is placed in RAM. Synchronization with RAM journal provides good I/O performance in any scenario. Full synchronization could occur in the cases described in this KB: Reasons why Full Synchronization may start – StarWind Knowledge Base

Disk-based journal placed on a separate disk from StarWind devices. It allows to avoid full synchronization for the devices where it's configured even when StarWind service is being stopped on all nodes.

Disk-based synchronization journal should be placed on a separate, preferably faster disk from StarWind devices. SSDs and NVMe disks are recommended as the device performance is defined by the disk speed, where the journal is located. For example, it can be placed on the OS boot volume.

It is required to allocate 2 MB of disk space for the synchronization journal per 1 TB of HA device size with a disk-based journal configured and 2-way replication and 4MB per 1 TB



of HA device size for 3-way replication.

Failure journal – provides good I/O performance, as a RAM-based journal, while all device nodes are in a healthy synchronized state. If a device on one node went into a not synchronized state, the disk-based journal activates and a performance drop could occur as the device performance is defined by the disk speed, where the journal is located. Fast synchronization is not guaranteed in all cases. For example, if a simultaneous hard reset of all nodes occurs, full synchronization will occur.

Continuous journal – guarantees fast synchronization and data consistency in all cases. Although, this strategy has the worst I/O performance, because of frequent write operations to the journal, located on the disk, where the journal is located.

			?	×
←	Replication V	Vizard		
	Synchronizat	tion Journal Setup		
	RAM- Synchr IO per	based journal ronization journal placed in RAM. Synchronization with RAM journal provides formance in any scenario.	good	
	O Disk-I Synchr	based journal ronization journal placed on disk.		
	۲	Failure journal The strategy provides good IO performance while all device nodes are in a state.	healthy	
	0	Continuous journal The strategy guarantees fast synchronization and data consistency in all ca	ases.	
	Current Node	My Computer\C\		
	Partner Node	My Computer\C\		
		Next	Canc	el

9. Click Change Network Settings.



		?	×
←	Replication Wizard		
	Network Options for Replication		
	Networks for Synchronization and Heartbeat		
	Press "Change Network Settings" to configure Interfaces		
	Networks for Heartbeat		
	Press "Change Network Settings" to configure Interfaces		
	Change Network Settings		
	Next	Cano	el:

10. Specify the interfaces for Synchronization and Heartbeat Channels. Click OK and then click Next.

172.16.20.* -Synchronization

172.16.10.* and Management as HeartBeat



Sp	Specify Interfaces for Synchronization Channels			×	
Select synchronization channel					
	Interfaces	Networks	Synchronization and H	Heartbeat	
	- Host Name: 172.16.2.31				
	172.16.10.1	172.16.10.0			
	172.16.2.31	172.16.2.0		v	
	172.16.20.1	172.16.20.0			
	Host Name: 172.16.2.	36			
	172.16.10.2	172.16.10.0		v	
	172.16.2.36	172.16.2.0		•	
	172.16.20.2	172.16.20.0	v		
					_
	Allow Free Select Interfa	ces	l	OK Cancel	



	?	×
 Replication Wizard 		
Network Options for Replication		
Networks for Synchronization and Heartbeat		1
172.16.20.0		
Networks for Heartbeat		
172.16.10.0;172.16.2.0		
Change Network Settings		
Next	Can	cel

11. In Select Partner Device Initialization Mode, select Synchronize from existing Device and click Next.



			?	×
←	Repli	cation Wizard		
	Select	Partner Device Initialization Mode		
	۲	Synchronize from existing Device All Data from existing Device would be copied to new Device.		
	0	Do not Synchronize Data on HA Nodes remains unchanged.		
		Next	Ca	incel

12. Click Create Replica.



		?	×
←	Replication Wizard		
	Creation Page		
	Creating Device Folder	^	
	Creating Storage File on Partner Host		
	Creating Storage Header on Partner Host		
	Creating Storage Device on Partner Host		
	Creating Device Header on Partner Host		
	Creating Device Header on current Host		
	Requesting Device Name		
	Updating Target Device on current Host	~	
			1
	Cost Della	Car	
	Create Replica	Can	cel

13. Click Close to close the wizard.



		?	×
~	Replication Wizard		
	Device Creation completed		
	Following Device was created		
	HAImage 1		
	Target Name: iqn.2008-08.com.starwindsoftware:ds1-sw-vm-01		
	Close	Can	cel

Star	Wind
HYPERCON	VERGENCE

🛃 Replication Manager for imagefile1 ? 🗙				
Refresh Add Replica Remo	× ove Replica			
Replication Partner				
iqn.2008-08.com.starwindsoftware:ds1-sw-vm-01 Connection Status Active Synchronization Status Synchronized Mode Synchronous				
Host Name	starwindvsa-59030629			
Target Name	iqn.2008-08.com.starwindsoftware:ds1-sw-vm-01			
Mode	Synchronous			
Priority	Second			
Synchronization Status	Synchronized			
Synchronization Channel	172.16.20.1:3260 💙			
Heartbeat Channel	172.16.10.1:3260 💙 172.16.2.31:3260 💙			
		Cla	se	

14. The successfully added device appears in StarWind Management Console.

 172.16.2.36 (172.16.2.36): 3261 DS1
HAlmage1
▲ 🔶 DS2
imagefile2

15. Right-click on the DS2 device and select Replication Manager from the shortcut menu.


StarWind Management Console			- 🗆	×
FILE HOST TARGET OPTIONS HELP				
Refresh Connect Disconnect Add Server Remove Server Add Device	Add Device (advance	ed) Add VTL Device Remove Device Help		
Servers				
A 📑 172.16.2.36 (172.16.2.36) : 3261		E2		
▲ 🔷 DS1	Remove F	Device 🗸 Encre remove Device 💁 Attach to Tarnet 🔍 Detach from ion 2008-08 com stanvindsoftwarerds.sw.vm.01		
HAImage1	© <u>Extend Im</u>	nage Size 🖼 Replication Manager		
▲ 🔷 DS2	Device	imagefile2		
imat × Remove Device	Virtual Disk	VSA Storage\mnt\sw\DS2\DS2.img		
Force remove Device		1 GB		
\$4 Attack to Taxaet		tor Size 512 Bytes		
Detach from ign.2008-08.com.starwindsoftwa	are:ds-sw-vm-01	ie No		
🐣 Extend Image Size		39F19F3971A74713		
Replication Manager		NULL TO		
	Mode	Ν/Δ		
StarWind Software Ready				1.

16. Select the Add Replica button in the top menu.

😴 Replication Manager for imagefile1	?	×
Refresh Add Replica Remove Replica		
Replication Partner		
Click to add replication partner		
PROPERTIES		
Host Name		
Target Name		
Mode		
Priority		
Synchronization Status		
Synchronization Channel		
	Clos	e

17. Select Synchronous "Two-Way" replication as a replication mode.



	?	×
←	Replication Wizard	
	Replication Mode	
	Synchronous "Two-Way" Replication Replication Partner must be connected to Client as Source Device as well, MPIO on Cl must be enabled, needs dedicated high Performance Network Connection for Synchronization.	ient
	Witness Node Witness node doesn't contain user data. In case when Node Majority policy is set for Synchronous replication device and there are two storage nodes, Witness Node must added to cluster to make number of nodes odd number and enable proper functioning Node Majority policy.	t be g of
	Next	Cancel

18. Specify a partner Host name or IP address and Port Number.



		?	×
~	Replication Wizard		
	Add Partner Node		
	Specify Partner Host Name or IP Address where Replication Node would be created		
	Host Name or IP Address		
	Port Number 3261		
	Next	Can	cel

19. Select Failover Strategy.



			?	×
÷	Replic	cation Wizard		
	F 1			
	Fallove	er Strategy		
	۲	Heartbeat Process node and communication failures using additional communication channel (heartbeat). At least one synchronization or heartbeat channel must be functional proper failover processing. Loss of all communication channels may lead to split bra issue, so it's recommended to use client iSCSI connection interfaces as heartbeat channel.	for ain	
	0	Node Majority Process node and communication failures using majority policy: node stays active w sees more than half of nodes including itself. In case of 2 storage nodes, requires configuring additional witness node. Does not require additional heartbeat channel	vhile it	
		Next	Canc	el

20. Select Create new Partner Device and click Next.



			?	×
←	Repli	cation Wizard		
	Partnei	r Device Setup		
	۲	Create new Partner Device Existing Device Parameters would be used as a Template.		
	0	Select existing Device Select existing Device on Partner Server.		
		Next	Can	cel

21. Select a partner device Location and click Next.



		?	×
←	Replication Wizard		
	Partner Device Setup		
	Location: VSA Storage\mnt\sw\		
	ign 2008-08 com starwindsoftware:ds2-sw.vm-02		
	Modify Target Name		
	Next	Cance	el

22. Select Synchronization Journal Strategy and click Next.

NOTE: There are several options – RAM-based journal (default) and Disk-based journal with failure and continuous strategy, that allow to avoid full synchronization cases.

RAM-based (default) synchronization journal is placed in RAM. Synchronization with RAM journal provides good I/O performance in any scenario. Full synchronization could occur in the cases described in this KB: Reasons why Full Synchronization may start – StarWind Knowledge Base

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It is required to allocate 2 MB of disk space for the synchronization journal per 1 TB of HA device size with a disk-based journal configured and 2-way replication and 4MB per 1 TB



of HA device size for 3-way replication.

Failure journal – provides good I/O performance, as a RAM-based journal, while all device nodes are in a healthy synchronized state. If a device on one node went into a not synchronized state, the disk-based journal activates and a performance drop could occur as the device performance is defined by the disk speed, where the journal is located. Fast synchronization is not guaranteed in all cases. For example, if a simultaneous hard reset of all nodes occurs, full synchronization will occur.

Continuous journal – guarantees fast synchronization and data consistency in all cases. Although, this strategy has the worst I/O performance, because of frequent write operations to the journal, located on the disk, where the journal is located.

			?	×
←	Replication V	Vizard		
	Synchronizat	tion Journal Setup		
	RAM- Synchr IO per	based journal ronization journal placed in RAM. Synchronization with RAM journal provides formance in any scenario.	good	
	O Disk-I Synchr	based journal ronization journal placed on disk.		
	۲	Failure journal The strategy provides good IO performance while all device nodes are in a state.	healthy	
	0	Continuous journal The strategy guarantees fast synchronization and data consistency in all ca	ases.	
	Current Node	My Computer\C\		
	Partner Node	My Computer\C\		
		Next	Canc	el

23. Click Change Network Settings.



		?	×
←	Replication Wizard		
	Network Options for Replication		
	Networks for Synchronization and Heartbeat		
	Press "Change Network Settings" to configure Interfaces		
	Networks for Heartbeat		
	Press "Change Network Settings" to configure Interfaces		
	Change Network Settings		
	Next	Cano	:el

24. Specify the interfaces for Synchronization and Heartbeat Channels. Click OK and then click Next.

172.16.20.* -Synchronization

172.16.10.* and Management as HeartBeat



Sp	Specify Interfaces for Synchronization Channels				
	Select synchronization chan	nel			
	Interfaces	Networks	Synchronization and H	Heartbeat	
	Host Name: 172.16.2.	31			
	172.16.10.1	172.16.10.0			
	172.16.2.31	172.16.2.0		v	
	172.16.20.1	172.16.20.0			
	Host Name: 172.16.2.	36			
	172.16.10.2	172.16.10.0		v	
	172.16.2.36	172.16.2.0		•	
	172.16.20.2	172.16.20.0	v		
					_
	Allow Free Select Interfa	ces	l	OK Cancel	



	?	×
- Replication Wizard		
Network Options for Replication		
Networks for Synchronization and Heartbeat 172.16.20.0		
Networks for Heartbeat 172.16.10.0;172.16.2.0		
Change Network Settings		
Next	Cano	el

25. In Select Partner Device Initialization Mode, select Synchronize from existing Device and click Next.



				?	×
←	Repli	cation Wizard			
	Select	Partner Device Initialization Mode			
	۲	Synchronize from existing Device All Data from existing Device would be copied to new Device.			
	0	Do not Synchronize Data on HA Nodes remains unchanged.			
		Next	t	Canc	el

26. Click Create Replica.



		?	×
←	Replication Wizard		
	Creation Page		
	Creating Device Folder	^	
	Creating Storage File on Partner Host		
	Creating Storage Header on Partner Host		
	Creating Storage Device on Partner Host		
	Creating Device Header on Partner Host		
	Creating Device Header on current Host		
	Requesting Device Name		
	Updating Target Device on current Host	~	
			1
	County Daveling	Car	
	Create Replica	Can	cel

27. Click Close to close the wizard.



		?	×
~	Replication Wizard		
	Device Creation completed		
	Following Device was created		
	HAImage2		
	Target Name: iqn.2008-08.com.starwindsoftware:ds-sw-vm-01		
	Close	Can	cel

StarWind	
HYPERCONVERGENCE	

🛱 Replication Manager for imagefile2 ? 🗙						
Refresh Add Replica Remo	× ove Replica					
Replication Partner						
iqn.2008-08.com.starwindsoftware:ds2-sw-vm-02 Connection Status Active Synchronization Status Synchronized Mode Synchronous						
PROPERTIES						
Host Name	starwindvsa-59030629					
Target Name	iqn.2008-08.com.starwindsoftware:ds2-sw-vm-02					
Mode	Synchronous					
Priority	Second					
Synchronization Status	Synchronized					
Synchronization Channel	172.16.20.1:3260 💙					
Heartbeat Channel	172.16.10.1:3260 💙 172.16.2.31:3260 💙					
		Clos	e			

28. The successfully added device appears in StarWind Management Console.

4 📑 172.16.2.36 (172.16.2.36) : 3261
▲ 🔷 DS1
HAImage1
▲ 🔶 DS2
HAImage2

Extend StarWind devices:

1. Right-click on the DS1 device and select (Extending Size of HA (High Availability Device) from the shortcut menu.



4 📑 172.16.2.36 (172.16.2.36) : 3261	HAIMAGE1						
▲ 🗢 DS1		X Demons Device X Force remove Device IV Change Device Authentication Settings & Change Superscription Drivity					
HA Remove Device	Replication Node Interfac	Released Construction Manager C Change ALUA access state C Change John Softward Provide State C C Change ALUA access state C C Change ALUA access state C C C C C C C C C C C C C C C C C C C					
HA Synchronization	Device	HAlmage1 1 GB					
Change Partner Authentication Settings	Target Name	ign.2008-08.com.starwindsoftware:ds1-sw-vm-01					
Change Synchronization Priority	Virtual Disk	imagefile1					
🔛 Replication Node Interfaces	Serial Id	B0169ABD02D647EB					
🔁 Replication Manager	Priority	First					
Change ALUA access state	Mode	Synchronous					
🖾 Snapshot Manager	Failover Strategy	Heartbeat					
Mark as "Synchronized"	Auto Synchronization after	Yes					
Extend Size of HA (High Availability) Device	Failure Synchronization Status	Synchronized					
🛆 Enter Maintenance Mode	HEALTH STATUS						
	 Storage is working properly 						

Enter the Amout of space to extend.
 DS1 need to add 511GB
 DS2 need to add 1023GB

Datastore Creation On Top Of Starwind Devices

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

+ ि New datastore		
1 Select creation type	Select creation type How would you like to create a datastore?	
 3 Select partitioning options 4 Ready to complete 	Create new VMFS datastore Add an extent to existing VMFS datastore Expand an existing VMFS datastore extent Mount NFS datastore	Create a new VMFS datastore on a local disk device
		CANCEL BACK NEXT FINISH

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



⁺ ₽ New datastore - DS*							
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 VMFS partition Name DS*						
	The following devices are unclaimed and can be used to o Name STARWIND iSCSI Disk (eui.8b8977a1c9f06bd9)	Type Disk	w VMFS	Capacity	~	Free space	~

3. Enter the datastore size and click Next.

⁺ New datastore - DS1					
 Select creation type Select device Select partitioning options Ready to complete 	Select partitioning opti Select how you would like to partitle Use full disk	ons on the device VMFS 6	•		
	Before, select a partition	n 3B)	After	1. VMFS (1 GB)	
			CANCEL	BACK	FINISH

4. Verify the settings and click Finish.



🖶 New datastore - DS1		
1 Select creation type 2 Select device	Ready to complete	
3 Select partitioning options	Name	DS1
4 Ready to complete	Disk	STARWIND iSCSI Disk (eui.8b8977a1c9f06bd9)
	Partitioning	Use full disk
	VMFS version	6
		VMFS (1 GB)
		CANCEL BACK NEXT 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.

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.

Configuration Of I/o Scheduler

 Login to StarWind VSAN VM web console and find in the Storage section under Drives the Virtual Disk that was recently added and choose it.
 Note: To log in to the StarWind VSAN VM web console you need to type the VM IP address and port 9090
 Example: 192.168.1.1:9090
 The default credentials:
 Login: user
 Password: rds123RDS



StarWind	Virtual SAN	1
1 the part		
User name	user	Server: starwindvsa-59030629
Password		Log in with your server user account.
Aller II	Reuse my password for privileged tasks	The second second
	Log In	

2. Open the "Terminal" page.



3. Check the storage to identify the disks, type lsblk.

user@sw-hca-vm-01:~							
[user@sw-hca-vm	-01 ~]\$	lsb	lk				
NAME	MAJ:MIN	RM	SIZE	RO	TYPE	MOUNTPOINT	
sda	8:0	0	16G	Ø	disk		
-sda1	8:1	0	1G	0	part	/boot	
i_sda2	8:2	0	15G	Ø	part		
-centos-swap	253:0	Ø	1.6G	Ø	lvm	[SWAP]	
i-centos-root	253:1	0	13.4G	Ø	lvm	/	
sdb	8:16	0	8.7T	Ø	disk		
└-sdb1	8:17	0	8.7T	Ø	part	/mnt/sw	
sr0	11:0	1	1024M	0	rom		
[user@sw-hca-vm-01 ~]\$							

4. Checking the scheduler settings: type cat /sys/block/sd*/queue/scheduler.



usen@sw-hca-vm-01:~							
[user@sw-hca-vm NAME sda -sda1 -sda2	-01 ~]\$ 1 MAJ:MIN 8:0 8:1 8:2	Lsbi RM 0 0 0	lk SIZE 16G 1G 15G	RO Ø Ø	TYPE disk part part	MOUNTPOINT /boot	
centos-swap centos-root sdb sdb1	253:1 253:1 8:16 8:17	0000	13.4G 8.7T 8.7T	0000	lvm disk part	/mnt/sw	
sr0 11:0 1 1024M 0 rom [user@sw-hca-vm-01 ~]\$ cat /sys/block/sdb/queue/scheduler noop [deadline] cfq [user@sw-hca-vm-01 ~]\$							

Result: [[bfq] mq-deadline none] OR [noop deadline [cfq]]

5. Set the scheduler settings:

type sudo nano /etc/udev/rules.d/89-disk-scheduler.rules.

```
[user@sw-hca-vm-01 ~]$ sudo nano /etc/udev/rules.d/89-disk-scheduler.rules
[sudo] password for user:
```

Password: rds123RDS

#Set none scheduler for non-rotating disks



ACTION=="add|change", SUBSYSTEM=="block", KERNEL=="sd[b-d]", ATTR{queue/scheduler}="noop", ATTR{queue/read_ahead_kb}="0"

where sd[b-d] are disks settings that should be applied. For a single disk use sdb or sdc . Note: For SSD disks scheduler should be "noop", for HDD "cfq" $\,$

6. Check the rule: type udevadm test /sys/block/sd*

user@sw-hca-vm-01:~

[usen@sw-hca-vm-01 ~]\$ udevadm test /sys/block/sdb



7. Check settings: type cat /sys/block/sd*/queue/scheduler

8. Do the above changes for all StarWind Virtual machines.

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 = "Health"

\$ESXiPassword = "StarWind2015!"

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.



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 all other StarWind Virtual machines.

Proactive Agent Configuration

1. Stop the StarWindHealth systemctl stop StarWindHealth.service

```
2. Change a line in /etc/systemd/system/StarWindHealth.service
ExecStart=/opt/StarWind/StarWindHealth/bin/nxagentd -d -c /etc/StarWindHealth.conf -M
freepas.starwind.com
to
ExecStart=/opt/StarWind/StarWindHealth/bin/nxagentd -d -c /etc/StarWindHealth.conf -M
pas.starwind.com
```

3. Reload the configuration for systemd systemctl daemon-reload

4. Start the StarWindHealth systemctl start StarWindHealth

```
5. Repeat all steps from this section on the all other StarWind Virtual machines.
```

Conclusion

Following this guide, a StarWind Virtual HCI Appliance (VHCA) powered by VMware vSphere was deployed and configured with StarWind Virtual SAN (VSAN) running in a CVM on each host. As a result, a virtual shared storage "pool" accessible by all cluster nodes was created for storing highly available virtual machines.



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