

StarWind Virtual SAN: Feature Configuration Guide for Scale Out on 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 SAN (VSAN)

Purpose

This document outlines how to reconfigure existing 2-node Hyperconverged setup with VMware vSphere by adding an additional node into configuration and getting a 3-node configuration with 2-way active-active StarWind VSAN replication. It's assumed that StarWind HA devices (DS1 and DS2) and corresponding datastores are already created. One more StarWind HA device will be added as a part of reconfiguration and corresponding datastore (DS3) will be created in VMware vSphere.

Audience

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

Expected result

The end result of following this guide will be a fully configured 3-node high-availability ESXI-based setup.

Prerequisites

StarWind Virtual SAN system requirements

Prior to installing StarWind Virtual SAN, 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 the StarWind Virtual SAN Best Practices document for additional information: https://www.starwindsoftware.com/resource-library/starwind-virtual-san-best-practices



Solution diagram

The idea behind scale-out is to grow both storage and compute power by adding additional nodes instead of adding disks, CPUs, NICs, or RAM to individual systems.

The diagram below illustrates the network and storage configuration of the 2-node Hyperconverged Scenario with VMware vSphere. The article on how to deploy a 2-node Hyperconverged Scenario with VMware vSphere could be found at the link below: https://www.starwindsoftware.com/resource-library/starwind-virtual-san-vsan-configurati on-guide-for-vmware-vsphere-esxi-7-vsan-deployed-as-a-controller-virtual-machine-cvmusing-web-ui/



The diagram below illustrates the resulting network and storage configuration of the 3node deployment with 2-way active-active StarWind VSAN replication:





1. ESXi hypervisor should be installed on each host.

2. StarWind VSAN should be installed on the Windows Server operating system deployed as VM on each host.

3. The hosts should have additional network interfaces to the connection the Host 2 to the Host 3 and the Host 1 to the Host 3 for iSCSI and Heartbeat traffic.

4. On each node, network interfaces to be used for Synchronization and iSCSI/StarWind heartbeat should be in different subnets and connected directly according to the network diagram above. Here, the 172.16.10.x, 172.16.11.x, 172.16.12.x subnets are used for the iSCSI/StarWind heartbeat traffic, while the 172.16.20.x, 172.16.21.x, 172.16.22.x subnets are used for the Synchronization traffic.

NOTE: Do not use ISCSI/Heartbeat and Synchronization channels over the same physical link. Synchronization and iSCSI/Heartbeat links can be connected either via redundant switches or directly between the nodes.

Replacing Partner For Ds2 Virtual Disk

1. Open StarWind Management Console and add the third StarWind server(SW3), which was previously deployed.



Add new StarWind Server		?	×
Host: SW3		: 3261	
Advanced >>	ОК	Can	icel

2. Open Replication Manager for DS2 device on the second StarWind node.



3. Click Remove Replica. The replica to the first node (SW1) will be removed.



🛱 Replication Manager for HAlmage2				
Refresh Add Replica	we Replica			
Replication Partner				
iqn.2008-08.com Connection Status A Synchronization Stat Mode Synchronous	. <mark>.starwindsoftware:sw1-ds2</mark> ctive us Synchronized			
PROPERTIES				
Host Name	SW1			
Target Name	iqn.2008-08.com.starwindsoftware:sw1-ds2			
Mode	Synchronous			
Priority	First			
Synchronization Status	Synchronized			
Synchronization Channel	172.16.20.10:3260 💙			
Heartbeat Channel	172.16.10.10:3260 💙 192.168.12.10:3260 💙			
		Clos	e	

4. Click Add Replica.



😴 Replication Manager for HAlmage2	?	×
Refresh Add Replica		
Replication Partner		
Click to add replication partner		
PROPERTIES		
Host Name		
Target Name		
Mode		
Priority		
Synchronization Status		
Synchronization Channel		
	Clos	e

5. Select Synchronous "Two-Way "Replication and click Next.



		?	×
\leftarrow	Replication Wizard		
	Replication Mode		
	Synchronous "Two-Way" Replication Replication Partner must be connected to Client as Source Device as well, MPIO of must be enabled, needs dedicated high Performance Network Connection for Synchronization.	on Client	
	Witness Node Witness node doesn't contain user data. In case when Node Majority policy is se Synchronous replication device and there are two storage nodes, Witness Node added to cluster to make number of nodes odd number and enable proper function Node Majority policy.	t for must be oning of	
	<u>N</u> ext	Can	cel

6. Enter Host Name or IP Address of the third StarWind node.



	?	×
Replication Wizard		
Add Partner Node		
Specify Partner Host Name or IP Address where Replication Node would be created		
Host Name or IP Address SW3 \checkmark		
Port Number 3261		
Next	Can	icel

7. Select Create new Partner device.



			?	×
←	Replic	ation Wizard		
	Partner	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

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:

https://knowledgebase.starwindsoftware.com/explanation/reasons-why-full-synchronizati on-may-start/

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.

			?	х
←	Replic	ation Wizard		
	Synchro	onization Journal Setup		
	۲	RAM-based journal Synchronization journal placed in RAM. Synchronization with RAM journal prov IO performance in any scenario.	/ides good	
	0	Disk-based journal Synchronization journal placed on disk.		
		 Failure journal The strategy provides good IO performance while all device nodes are state. 	in a healthy	
		Continuous journal The strategy guarantees fast synchronization and data consistency in	all cases.	
	Curren	t Node My Computer\C\		
	Partne	r Node My Computer\C\		
		Next		r al
		<u>IN</u> ext	Can	Lei

9. Click Change Network Settings. Specify the interfaces for Synchronization and Heartbeat channels. Click OK. Then click Next.

ecify Interfaces for Synchronization Channels					
Select synchronization channel					
Interfaces	Networks	Synchronization and H	Heartbeat		
🖃 Host Name: SW	/2				
172.16.10.20	172.16.10.0				
172.16.11.10	172.16.11.0		~		
172.16.20.20	172.16.20.0				
172.16.21.10	172.16.21.0				
192.168.12.20	192.168.12.0				
🖃 Host Name: SW	/3				
172.16.11.20	172.16.11.0		v		
172.16.12.10	172.16.12.0				
172.16.20.30	172.16.20.0				
172.16.21.20	172.16.21.0	V			
172.16.22.10	172.16.22.0				
192.168.12.30	192.168.12.0		v		
Allow Free Select I	nterfaces		OK Cancel		
Allow Free Select I	nterfaces		OK Cancel		

10. Click OK to return to Network Option for Synchronization Replication. Click Next.

11. Click Create Replica.



		Ĩ	? ×
←	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 Changing Failover Strategy 		
	C Adding Partner Device		
	Create Rep	lica	Cancel

12. After creation, click Finish to close the Replication Wizard. The result should look as shown in the screenshot below.



StarWind Management Conso	le				_	×
FILE HOST TARGET OPTIO	NS HEL	p				
Refresh Connect Disconnect A	Add Server	Remove Server Add Device	e Add Device (advand	ed) Add VTL Device Remove	Target Help	
Servers						
SW1 (127.0.0.1):	\diamond	DS2				
▲ → DS1 → HAlmage1		Target IQN Clustering	iqn.2008-08.com.stan Yes	windsoftware:sw3-ds2		
▲ 🛄 SW2 (192.168.12.2		Group	General			
4 🔷 DS1	c	Devices (1)				
HAImage1		Device Name	LUN	Device Type	State	 C
▲ 🔶 DS2		📼 HAlmage1	0	НА	Active	ŧ
HAImage2		iSCSI Sessions (3) Initiator Name Paiqn.2008-08.com.sta	rwindsoftware:sw2-	ds2		
HAlmage1		🏷 iqn.2008-08.com.sta 🏷 iqn.2008-08.com.sta	rwindsoftware:sw2- rwindsoftware:sw2-	ds2 ds2		
	© -	CHAP Permission	IS (0) + <u>Add P</u> Initiator Cl	ermission HAP Name		
				No CHAP Permissions con	figured	
	<					>
StarWind Software Ready						 11.

Creating Virtual Disk Ds3

1. Select SW3 server and open Add Device wizard by right-clicking the StarWind server and selecting Add Device (advanced) from the shortcut menu or by clicking the Add Device (advanced) button on the toolbar.

2. Once Add Device wizard appears, follow the instructions to complete the creation of a new disk, which will be replicated to SW1 server.

3. Select Hard Disk Device as the type of a device to be created. Click Next to continue.

- 4. Select Virtual Disk. Click Next to continue.
- 5. Specify virtual disk location and size.



StarWind Management Console		_		\times
FILE HOST TARGET OPTION	S HELP			
Refresh Connect Disconnect Ac	Id Server Remove Server Add Device (advanced)	? Help		
Servers			Performan	ce
▲ 🔄 SW1 (127.0.0.1) :: ▲ 🔶 DS1	Add Device Wizard			^
HAlmage1	Virtual Disk Location			
 SW2 (192.168.12.2 DS1 	Create a New Virtual Disk			
HAlmage1	Name: DS3			
▲ 🔶 DS2	Location: My Computer\D\			
HAlmage2	Size: 5 GB 🗸			
4 🗐 sw3 (192.168.12.2	O Use an Existing Virtual Disk			
▲ 🔷 DS2	Location: 🗸			
HAlmage1	Read-Only Mode			
		_		
	Next Cancel			
	<			×
StarWind Software Ready				_

6. Specify Virtual Disk Options and click Next to continue.



	?	×
← Add Device Wizard		
Virtual Disk Options		
Thick-provisioned		
Olsfs		
Deduplication		
StarPack Cache Size: 16 MB \sim		
Block Size Olive 512 bytes sector size		
Ouse 4096 bytes sector size. May be incompatible with some clients		
Next	Ca	ncel

NOTE: Sector size should be 512 bytes when using ESXi.

7. Define the RAM caching policy and specify the cache size in the corresponding units if required.



		?	×
~	Add Dev	vice Wizard	
	Specify [Device RAM Cache Parameters	
		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	Cancel

8. Define the Flash caching policy and the cache size. Click Next to continue.



							?	×
÷	Add De	evice Wizard	I					
	Specify	Flash Cao	che Param	neters				
	No F	Flash Cache						
	OUse	Flash Cache						
	ľ	lame:	Flash-DS3					
	L	ocation:	My Compute	er \D \				
	9	iize:	1	$_{\rm GB} ~\sim~$				
								-
					[Next	Cano	el:

9. Specify Target Parameters. Select the Target Name checkbox to enter a custom name of the target if required. Otherwise, the name will be generated automatically in accordance with the specified target alias. Click Next to continue.



		?	×
←	Add Device Wizard		
	Target Parameters		
	Choose a Target Attachment Method		_
	Create new Target		~
	Target Alias		
	DS3		
	Target Name		
	ign.2008-08.com.starwindsoftware:sw3-ds3		
	Allow multiple concurrent iSCSI Connections		
	Next	Car	ncel

10. Click Create to add a new device and attach it to the target and Finish to close the wizard.

11. Right-click on the recently created device and select Replication Manager from the shortcut menu.



StarWind Management Concole	X						
FILE HOST TARGET OPTIONS HELP							
Refresh Connect Disconnect Add Server Remove Server Add	+ + Add Device (advanced) Add VTL Device Remove Device Help						
Servers							
• Sw1 (127.0.0.1) : : IMAGEFILE2							
▲ <u>Bernove Device</u> → <u>Force remove Device</u> → <u>Attach to Target</u>							
HAlmage1	n.2008-08.com.starwindsoftware:sw3-dc3 🛛 🛱 Extend Image Size						
SW2 (192.168.12.2	nager						
Device Device	imagefile2						
Virtual Disk	My Computer\D\DC3\DC3.img						
HAImage1 Persistent Reservation	ns Yes						
Size	5 GB						
Virtual Disk Sector Siz	re 512 Bytes						
HAImage2 Read-Only Mode	No						
▲ SW3 (192 168 12 3	CCC4210169812577						
Asynchronous Mode	Yes						
CACHE							
HAlmage1 Mode	N/A						
▲ ♦ DS3							
Imag Kemove Device							
Force remove Device							
GL Aller b to Torret							
Attach to Target	4. 0						
Detach from ign.2008-08.com.starwin	asoftware:swo-aso						
🚔 Extend Image Size							
🛒 Replication Manager							
<	>						
StarWind Software Ready							

12. Click Add replica and select Synchronous "Two-Way Replication".



		?	х
~	Replication Wizard		
	Replication Mode		
	Synchronous "Two-Way" Replication Replication Partner must be connected to Client as Source Device as well, MPIO or must be enabled, needs dedicated high Performance Network Connection for Synchronization.	n Client	
	Witness Node Witness node doesn't contain user data. In case when Node Majority policy is set Synchronous replication device and there are two storage nodes, Witness Node m added to cluster to make number of nodes odd number and enable proper function Node Majority policy.	for hust be hing of	
	Next	Cano	:el

13. Specify partner Host Name (SW1) 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 SW1 ~		
Port Number 3261		
	1	
Next	Car	ncel

14. Select Create new Partner Device and click Next.



			?	×
←	Replic	ation Wizard		
	Partner	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	Cano	:el

15. Select Synchronization Journal Strategy and click Next.

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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- 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

16. Click Change Network Settings.



172.16.11.0 172.16.12.0 172.16.20.0	Synchronization and H	Heartbeat
Networks 172.16.11.0 172.16.12.0 172.16.20.0	Synchronization and H	Heartbeat
172.16.11.0 172.16.12.0 172.16.20.0		
172.16.11.0 172.16.12.0 172.16.20.0		v
172.16.12.0 172.16.20.0		v
172.16.20.0		
172 16 21:0		
172.10.21.0		
172.16.22.0	v	
192.168.12.0		v
172.16.10.0		
172.16.12.0		
172.16.20.0		
172.16.22.0	v	
192.168.12.0		v
3085		OK Cancel
	172.16.22.0 192.168.12.0 172.16.10.0 172.16.12.0 172.16.20.0 172.16.22.0 192.168.12.0	172.16.22.0 192.168.12.0 □ 172.16.10.0 □ 172.16.12.0 □ 172.16.20.0 □ 172.16.22.0 ✓ 192.168.12.0 □ aces

16. Click Create Replica.



	?	×
Replication Wizard		
Creation Page		
DD. Constinue Davies Falder		
Creating Device Folder Creating Storage File on Partner Hort		
Creating Storage Header on Partner Host		
Creating Storage Device on Partner Host		
Creating Device Header on Partner Host		
Changing Failover Strategy		
Adding Partner Device		
Create Replica	Car	icel

17. The added devices are seen in the StarWind Console.



🗟 StarWind Management Console - 🗆 🗙							
FILE HOST TARGET OPTION	IS HELF	0					
Refresh Connect Disconnect Ac	dd Server	Remove Server Add Device	e Add Device (advanced	d) Add VTL Device Remove Ta	arget Help		
 Servers Sw1 (127.0.0.1):: ODS1 	¢	DS3					
HAlmage1		Target IQN Clustering	iqn.2008-08.com.starwi	ndsoftware:sw1-ds3			
▲ 🔷 DS3		Group	General				
HAImage2	ſ	Devices (1)					
4 📕 SW2 (192.168.12.2		Device Name	LUN	Device Type	State		
4 🔶 DS1		📼 HAlmage2	0	HA	Active		:
HAlmage1	♦	iSCSI Sessions (3) Initiator Name					
HAlmage2		🎝 iqn.2008-08.com.sta	rwindsoftware:sw3-d	s3			
🖌 🚺 SW3 (192.168.12.3		🏷 iqn.2008-08.com.sta	rwindsoftware:sw3-d	s3			
4 🔷 DS2		िः iqn.2008-08.com.starwindsoftware:sw3-ds3					
HAlmage1	✑	CHAP Permissior	ns (0) + <u>Add Per</u>	mission			
HAlmage2		Target CHAP Name	Initiator CH/	AP Name			
-				No CHAP Permissions conțigi	urea		
	۲						>
StarWind Software Ready							//

Creating Datastores

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



Datastores Adapters Devices						
🖀 New datastore 📧 Increase capacity 🚏 Register a VM 🧠 Datastore browser 🧲 Refresh 🌞 Actions						
Image: Second						
1 Select creation type 2 Select device 3 Select partitioning options	Select creation type How would you like to create a datastore?					
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				
vm ware						
		Back Next Finish Cancel				

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

New datastore Increase capacity Register a VM Datastore browser Refresh Actions Name Drive Type Capacity Provisioned I basect creation type Select device Select device on which to create a new VMFS partition Basect partitioning options Provisioned Diff The following devices are unclaimed and can be used to create a new VMFS datastore Actions Provisioned Provisioned Provisioned Provisioned Provisioned Provisioned Provisioned Provisioned Provisioned Provisioned Provisioned Provisioned Provisioned Provisioned Provisioned Provisioned Provisioned Provisioned Provisioned Provisioned Provisioned Provisioned Provisioned Provisioned Provisioned Provisioned Provisioned	Datastores Adapters Devices								
Name Drive Type Capacity Provisioned * 1 Select creation type Select device Select device Select datastore - DS1 * 2 Select device Select advice on which to create a new VMFS partition Name Select for the select and select series and ser	😫 New datastore 📧 Increase capacity	🖉 🚰 Register a VM 🛛 🛱 Datastore browser	C Refres	h 🚯 /					
New datastore - DS1 Select creation type Select davice Select davice on which to create a new VMFS partition Ready to complete DS1 The following devices are unclaimed and can be used to create a new VMFS datastore The following devices are unclaimed and can be used to create a new VMFS datastore STARWIND ISCSI Disk (eui 22ae584be2580eda) Disk 5 GB 5 GB Disk 6 GB 6 GB 2 items	Name	~	Drive Type		~ Ca	pacity		~ Provision	ned
 I select creation type Select device Select partitioning options I select partitioning options I select a device on which to create a new VMFS partition Name DS1 The following devices are unclaimed and can be used to create a new VMFS datastore Name STARWIND ISCSI Disk (eui 22ae584be2580beda) Disk 5 GB 5 GB G B 6 GB S TARWIND ISCSI Disk (eui 8d6cd81bccb9730d) Disk 6 GB 6 GB 2 Items	省 New datastore - DS1								
The following devices are unclaimed and can be used to create a new VMFS datastore Name Type Capacity Free space Image: Capacity Free space Image: Capacity Free space Image: Capacity Image: Capacity Free space Image: Capacity	 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 Name DS1	S partition						
Name Vipe Capacity Free space STARWIND ISCSI Disk (eui 22ae584be2580eda) Disk 5 GB 5 GB STARWIND ISCSI Disk (eui 8d6cd81bccb9730d) Disk 6 GB 6 GB STARWIND ISCSI Disk (eui 8d6cd81bccb9730d) Disk 6 GB 6 GB Image: Starwind isconstruction Image: Starwind isconstruction Image: Starwind isconstruction Image: Starwind isconstruction Image: Starwind isconstruction Image: Starwind isconstruction Image: Starwind isconstruction Image: Starwind isconstruction Image: Starwind isconstruction Image: Starwind isconstruction Image: Starwind isconstruction Image: Starwind isconstruction Image: Starwind isconstruction Image: Starwind isconstruction Image: Starwind isconstruction Image: Starwind isconstruction Image: Starwind isconstruction Image: Starwind isconstruction Image: Starwind isconstruction Image: Starwind isconstruction Image: Starwind isconstruction Image: Starwind isconstruction Image: Starwind isconstruction Image: Starwind isconstruction Image: Starwind isconstruction Image: Starwind isconstruction Image: Starwind isconstruction Image: Starwind isconstruction Image: Starwind isconstruction Image: Starwind isconstructisco		The following devices are unclaimed and can b	e used to creat	te a new V	MFS data	astore			
STARWIND ISCSI Disk (eui 22ae584be2580eda) Disk 5 GB 5 GB STARWIND ISCSI Disk (eui 8d6cd81bccb9730d) Disk 6 GB 6 GB 2 items		Name	~	Туре	~	Capacity	~	Free space	~
		STARWIND ISCSI Disk (eui.22ae584be25	i80eda)	Disk		5 GB		5 GB	
vmware.		STARWIND ISCSI Disk (eui.806c081bccb	97300)	DISK		6 GB		o GB	
	vm ware [*]								A A

3. Enter datastore size. Click on Next.



🗄 New datastore - DS1							
 1 Select creation type 2 Select device 3 Select partitioning options 4 Ready to complete 	Select partitioning options Select how you would like to partition the device						
	Use full disk	VMFS 6	er				
	Free space (5 C	98)	1. VMFS (5 GB)				
vmware		_	Back Next	Finish Cancel			

4. Verify the settings. Click on Finish.

🖺 New datastore - DS1		
 1 Select creation type 2 Select device 3 Select partitioning options 	Ready to complete	
4 Ready to complete	Name	D\$12
	Disk	STARWIND iSCSI Disk (eui.22ae584be2580eda)
	Partitioning	Use full disk
	VMFS version	6
vm ware [*]		VIVES (306)
		Back Next Finish Cancel

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

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



Datastores Adapters Devices					
😫 New datastore 📧 Increase capacity 🛛 💕 Register a VM 🛛 🦏 Datastore browser 🔰 🤁 Refresh 🛛 🦣 Actions					
Name ~	Drive Type 🗸 🗸	Capacity ~	Provisioned ~	Free ~	
datastore1 (1)	Non-SSD	32.5 GB	972 MB	31.55 GB	
DS1	Non-SSD	4.75 GB	1.41 GB	3.34 GB	
DS2	Non-SSD	5.75 GB	1.41 GB	4.34 GB	

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

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

Getting Started Summary Monito	or	Configure Permissions VMs Datastores Network	vorks	Up	iate Manage	r					
44		Storage Devices									
✓ Storage	1	🛃 🚊 🗔 🛃 🛋 🥥 🥥 💶 🎇 Ali Ac	tions ¬	•	-				(Q Filter	•
Storage Adapters		Name	LUN		Type	Capacity	Operational State	Hardware Acceleration	Drive Type	Transport	
Storage Devices		Local VMware Disk (mpx.vmhba0:C0:T0:L0)		0	disk	40,00 GB	Attached	Not supported	HDD	Parallel SCSI	
Datastores	::	Local NECVMWar CD-ROM (mpx.vmhba64:C0:T0		0	cdrom		Attached	Not supported	HDD	Block Adapter	ł
Host Cache Configuration		STARWIND iSCSI Disk (eui.22ae584be2580eda)		0	disk	5,00 GB	Attached	Supported	HDD	iSCSI	
Protocol Endpoints		STARWIND iSCSI Disk (eui.8d6cd81bccb9730d)		0	disk	6,00 GB	Attached	Supported	HDD	iSCSI	
I/O Filters	H										
						_					
Virtual switches		Device Details									
VMkernel adapters		Properties Paths									
Physical adapters		 Logical Partitions 0 									
TCP/IP configuration	TCP/IP configuration Multinathing Policies										
Advanced											
- Virtual Machines		Path Selection Policy Most Recently Used (VMware)									
VM Startup/Shutdown Storage Array Type Policy VMW_SATP_ALUA .											
4											



Edit Multipathing Policie	es for eui.22ae584be	2580eda		?		
Path selection policy:	Path selection policy:					
Round Robin (VMware)						
Select the preferred path for	this policy:					
e -		Q	Filter	•		
Runtime Name	Status	Target	LUN	Preferred		
vmhba65:C0:T3:L0	♦ Active (I/O)	iqn.2008-08.com.starwindsoftware:sw	0			
vmhba65:C0:T1:L0	 Active (I/O) 	iqn.2008-08.com.starwindsoftware:sw	0			
			ОК	Cancel		

Performance Tweaks

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

System	Hardware L	icensing Packages Services Security & users	
		_	
Advance	d settings	🥒 Edit option 🕴 Ċ Refresh 🕴 🏠 Actions	
Autostar	t	Kev 🔺	× Name ×
Swap		Disk.DelayOfibusy	Delay in miniseconus for completion or commanus with a DOST status
Time & d	ate	Disk.DeviceReclaimTime	The number of seconds between device re-claim attempts
		Disk.DisableVSCSIPollInBH	Disable VSCSI_Poll in bottom half. Set to 1 to disable.
		Disk.DiskDelayPDLHelper	Delay PDL helper in secs
		Disk.DiskMaxIOSize	Max Disk READ/WRITE I/O size before splitting (in KB)
		Disk.DiskReservationThreshold	Time window within which refcounted reservations on a device are permitt
		Disk.DiskRetryPeriod	Retry period in milliseconds for a command with retry status
		Disk.DumpMaxRetries	Max number of I/O retries during disk dump
		Disk.DumpPollDelay	Number of microseconds to wait between polls during a disk dump.
		Disk.DumpPollMaxRetries	Max number of device poll retries during disk dump
		Disk.EnableNaviReg	Enable automatic NaviAgent registration with EMC CLARiiON and Invista
		Disk.FailDiskRegistration	Fail device registration if disk has only standby paths and supports only im
		Disk.FastPathRestoreInterval	Time interval (in msec) to monitor the IO latency to evaluate eligibility for f
		Disk.IdleCredit	Amount of idle credit that a virtual machine can gain for I/O requests

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



System Hardware L Advanced settings	censing Packages Services Security & users / Edit option C Refresh Actions
Autostart Swap Time & date	Key ▲ ✓ Disk.DerayOnbusy ✓ Disk.DerayOnbusy ✓ Disk.DerayOnbusy ✓ Disk.DerayOnbusy ✓ Disk.DiskDelayPDLHelper ✓ Disk.DiskMaxIOSize ✓
	Edit option - Disk.DiskMaxIO Size New value 512 (long integer)
	Quick filters

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

NOTE: In certain cases, in Virtual Machine, Windows event log may report an error similar to "Reset to device, \Device\RaidPort0, was issued". Check this KB acticle for a possible solution.

Conclusion

Following this guide, the existing 2 node ESXI -based cluster was reconfigured and the 3d node was added. As a result, the cluster was extended and got more available space for storing highly available virtual machines.



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