

StarWind Virtual SAN: Configuration Guide for Oracle Linux Virtualization Manager (OLVM) [KVM], VSAN Deployed as a Controller VM (CVM) using PowerShell CLI

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TECHNICAL PAPERS



StarWind Virtual SAN: Configuration Guide for Oracle Linux Virtualization Manager (OLVM) [KVM], VSAN Deployed as a Controller VM (CVM) using PowerShell CLI



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About StarWind

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

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Annotation

Relevant Products

StarWind Virtual SAN

Purpose

This guide offers detailed instructions on how to configure shared highly-available storage for Oracle Linux Virtualization Manager. The storage is provided StarWind VSAN running as a Controller Virtual Machine (CVM). It encompasses essential system settings ensuring a seamless and effective setup.

Audience

The document is created for IT specialists, system administrators, and professionals who want to configure Oracle Linux Virtualization Manager with StarWind VSAN-based storage.

Expected Result

By the guide's end, users will be able to configure StarWind Virtual SAN CVM for Oracle Linux Virtualization Manager.

Introduction To Starwind Virtual San Cvm

StarWind Virtual SAN Controller Virtual Machine (CVM) comes as a prepackaged Linux Virtual Machine (VM) to be deployed on any industry-standard hypervisor. It creates a VM-centric and high-performing storage pool for a VM cluster.

This guide describes the deployment and configuration process of the StarWind Virtual SAN CVM.

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

Pre-Configuring The Kvm Hosts

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



1. Make sure that a oVirt engine is installed on a separate host.

2. Deploy oVirt on each server and add them to oVirt engine.

3. Define at least 2x network interfaces on each node that will be used for the Synchronization and iSCSI/StarWind heartbeat traffic. 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 (see diagram above).

4. Separate Logical Networks should be created for iSCSI and Synchronization traffic based on the selected before iSCSI and Synchronization interfaces. Using oVirt engine Netowrking page create two Logical Networks: one for the iSCSI/StarWind Heartbeat channel (iSCSI) and another one for the Synchronization channel (Sync).

5. Add physical NIC to Logical network on each host and configure static IP addresses. In this document, the 172.16.10.x subnet is used for iSCSI/StarWind heartbeat traffic, while 172.16.20.x subnet is used for the Synchronization traffic.

NOTE: In case NIC supports SR-IOV, enable it for the best performance. Contact support for additional details.

Enabling Multipath Support

8. Connect to server via ssh.

9. Create file /etc/multipath/conf.d/starwind.conf with the following content:

devices{	
device{	
	vendor "STARWIND"
	product "STARWIND*"
	<pre>path_grouping_policy multibus</pre>
	path_checker "tur"
	failback immediate
	<pre>path_selector "round-robin 0"</pre>
	rr_min_io 3
	rr_weight uniform
	hardware handler "1 alua"
}	_
}	

10. Restart multipathd service.

systemctl restart multipathd

11. Repeat the same procedure on the other server.

Creating NFS share



- 1. Make sure that each host has free storage to create NFS share.
- 2. Enable nfs server and rpcbind services.

systemctl enable -- now nfs-server rpcbind

3. Create directory for NFS share.

mkdir -p /mnt/nfs

4. Change rights and owner of the share to KVM

chmod 0775 /mnt/nfs/ chown -R nobody:users /mnt/nfs/

5. Add NFS share to /etc/exports file.

vi /etc/exports
/mnt/nfs/ *(rw,anonuid=36,anongid=36)

6. Restart NFS server service.

systemctl restart nfs-server

7. Check that share has been exported.

exportfs -rvv

8. Add firewall rules for NFS.

firewall-cmd --add-service={nfs,nfs3,rpc-bind} --permanent
firewall-cmd --reload

Deploying Starwind Virtual San Cvm

1. Download StarWind VSAN CVM KVM: VSAN by StarWind: Overview



- 2. Extract the VM StarWindCVM.ova file from the downloaded archive.
- 3. Upload StarWindCVM.ova file to the oVirt Host via any SFTP client.
- 4. Change owner of the StarWindCVM.ova.



5. Login to oVirt and open Compute -> Virtual Machines page. Choose Import.



6. Specify path to .ova file and choose VM to import. Click Next.



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≡ oVirt open virtua		,∎ ∾ ≡⁰ 4² 0 - 4 -
🕐 Dashboard	Import Virtual Machine(s)	×
🏢 Compute 🛛	Data Center sw-dc v Source Virtual Appliance (OVA) v	Create Snapshot Migrate
🚠 Network >	Host sw-demo-node-01.sw.local	1 - 2 < > I → Data Center Memory C
Storage >	File Path /mnt/nvme01/StarWindCVM.ova	w-dc
🔅 Administration >	Virtual Machines on Source Virtual Machines to Import Name	
> Events	StarWindCVM	•
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		Next Cancel

7. Verify VM settings and configure networks. Click OK.

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		Import Vi	irtual Machine	(s)									×		
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0)))	Storage	Clone	Name			Origin		Memory		CPUs	Architecture Dis	sks	1		
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ф	Administra														
		General	Network Inter	faces Disks			0								
		Name:		StarWindCVM	-01	Physical Memory	819	2 MB	Cluster		4.7	1			
						Guaranteed:			Compatit Version:	oility		- 1			
		Operatin	g System:	Red Hat Ente	rpri v	Number of CPU	8 (2	:4:1)	VM ID:		14b7f2af-5605-				
						Cores:					4295-983e- 22db6333cdf2				
		Descripti	on:			Guest CPU Count:	N//								
		Template	8			Number of	1								
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8. Repeat all the steps from this section on other oVirt hosts.



Configuring Starwind Virtual San Vm Settings

1. Open the VM console and check the IP address received via DHCP (or which was assigned manually).



Another alternative is to log into the VM via console and assign static IP using nmcli if there is no DHCP.

2. Now, open the web browser and enter the IP address of the VM. Log into the VM using the following default credentials:

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



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•	StarWind	Virtual SAN		
	User name Use Password •••	Server: starwindvsa-34665828 Log in with your server user account: Reuse my password for privileged tasks		
		Log In		
				3. A

ter a successful login, click Accounts on the left sidebar.

4. Select a user and click Set Password.

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🗐 starwindvsa-34	Accounts > user	Set Password		
System	user	Old Password		Terminate Session Delete
	Full Name user	New Password		
Storage	User Name user	Confirm New Password		
Networking	Roles 🗹 Server Administrator			
Accounts	Last Login Invalid Date		Cancel Set	
	Access 🛛 Lock Account	Never lock account		
Terminal	Password Set Password Force C	hange Never expire password		
	Authorized Public SSH Keys			•
	There are no authorized public keys for	this account.		
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				5.

On the left sidebar, click Networking.



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🗐 starwindvsa-34	Kbps Sending		Kbps Receiving								
System Logs	400		400								
Storage	20:32	20:33 20:34 20:35	20:32 20:33	20:34 20:35							
Networking	Firewall										
Accounts	0 Active Rules										
Services	Interfaces		Add Bo	Add Team Add Bridge Add VLAN							
Terminal	Name	IP Address	Sending	Receiving							
	eth0	192.168.12.214/23	8.36 Kbps	8.46 Kbps							
	eth1	172.16.10.10/24	0 bps	14.8 Kbps							
	eth2	172.16.20.10/24	3.23 Kbps	11.4 Kbps							
	Networking Logs										
	May 8, 2023										
	20:35 <info> [168356735 20:35 <info> [168356735</info></info>	7.4612] audit: op="checkpoint-destroy" arg="/org, 7.4607] checkpoint[0x561a96b655b0]: destroy /org,	/freedesktop/NetworkManager/Checkpoin /freedesktop/NetworkManager/Checkpoin	t/4" NetworkManager t/4 NetworkManager							

Here, the Management IP address of the StarWind Virtual SAN Virtual Machine can be configured, as well as IP addresses for iSCSI and Synchronization networks. In case the Network interface is inactive, click on the interface, turn it on, and set it to Connect automatically.

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

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7. The result should look like in the picture below:



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Terminal	Name	IP Address	Sending	Receiving
	eth0	192.168.12.214/23	8.36 Kbps	8.46 Kbps
	eth1	172.16.10.10/24	0 bps	14.8 Kbps
	eth2	172.16.20.10/24	3.23 Kbps	11.4 Kbps
	Networking Logs			
	May 8, 2023			
	20:35 <info> [168356735 20:35 <info> [168356735</info></info>	7.4612] audit: op="checkpoint-destroy" arg="/org 7.4607] checkpoint[0x561a96b655b0]:destroy /org	/freedesktop/NetworkManager/Checkpoint/4 /freedesktop/NetworkManager/Checkpoint/4	" NetworkManager

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

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starwindvsa-34	Networking → eth1		
System	Kbps Sending	Kbps Receiving	
Logs	400	400	
Storage	0	0	
Networking	20:34 20:35 20:36 20:37 20:38	20:34 20:35	20:36 20:37 20:38
Accounts	eth1 hv_netvsc 00:15:5D:0C:39:03		\sim
Services	Status 172.16.10.10/24, fe80:0:0:0:5804:44b8:3955:e9bc/64		
Terminal	Carrier 1 Gbps		
	General 🗹 Connect automatically		
	IPv4 Address 172.16.10.10/24		
	IPv6 Automatic		
	WIU 9000		

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

9.Open the file corresponding to the Management interface using a text editor, for example: sudo nano /etc/sysconfig/network-scripts/ifcfg-eth0



10.

- 1. Edit the file:
- Change the line BOOTPROTO=dhcp to: BOOTPROTO=static
- Add the IP settings needed to the file:
- IPADDR=192.168.12.10
- NETMASK=255.255.255.0
- GATEWAY=192.168.12.1
- DNS1=192.168.1.1

11. Restart the interface using the following cmdlet: sudo ifdown eth0, sudo ifup eth0, or restart the VM.

12. C	hange	the	Host	Name	from	the	System	tab	by	clicking	on	it:
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🗐 starwindvsa-34	Hardware Asset Tag	Microsoft Corporation 4089-0074-9445-97	Change Host Nam	e ef	OCDI Leares							
System	Machine ID	fa6b289621d2437	Pretty Host Name	sw1								
Logs	Operating System	CentOS Linux 7 (Co	Real Host Name	sw1				_				
Storage	Secure Shell Keys	Show fingerprints						20:36		20:37		
Networking	Host Name	starwindvsa-34665										
Accounts	Domain	Join Domain					Cancel Cha	inge				
Services	System Time Power Options	2023-05-08 13:37 (Restart ~	_	0	20:33	20:34	20:35	20:36	_	20:37		
Terminal	Performance Profile	none		KiB/s Di	sk I/O							
				192								
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				Mbps Ne 1200	etwork Traffic							
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13. Change System time and NTP settings if required:



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🗐 starwindvsa-34	Hardware Asset Tag	Microsoft Corporation Virtual Machin- 4089-0074-9445-9761-6594-9417-84	Change Sys	tem Time								
System	Machine ID Operating System	fa6b289621d243798a9f5d8abc790 CentOS Linux 7 (Core)	Time Zone	America/New York		×						
Logs Storage	Secure Shell Keys	Show fingerprints	Set Time	Automatically using NTP		~	20:36	20:37			20:38	
Networking	Host Name	starwindvsa-34665828			Cancel	Change						
Accounts Services	Domain System Time	2023-05-08 13:38 ()	4									
Terminal	Power Options Performance Profile	Restart v	0 KiB/s Dis	20:34 k I/O	20:35		20:36	20:37			20:38	
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			128				~ 1					
			Mbps Net	20:34 twork Traffic	20:35		20:36	20:37			20:38	
			800		_							
			400	A								

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

Configuring Storage

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

Configuring Storage With Hardware Raid

1. Open VM Settings on oVirt Virtual Machines page and choose Host Devices tab. It is recommended to pass the entire RAID array to the VM. Click Add device.



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Storage >				Add device Remove device	Manage vGPU View CPU Pinning
🏟 Administration >	Name pci_0000_89_00_0	Capability pci	Vendor Samsung Electronics Co Lt	d (0x1 NVMe SSD Controller 172Xa/1	72Xb (0xa822) vfio-p
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2. Choose RAID controller or HBA and pass it to the VM. Click OK.

ined Host	sw-demo-node-01	.sw.local v					
pability	pci	~					
ailable Host	Devices						
] pci_0000_	_01_00_1	Intel Corporation (0x8086)	1350 Gigabit Network Connection (0x1521)				15
) pci_0000_	_01_00_0	Intel Corporation (0x8086)	1350 Gigabit Network Connection (0x1521)	igb			14
] pci_0000_	_03_00_0	Matrox Electronics Systems Ltd	Integrated Matrox G200eW3 Graphics Controller (0x0536)	mgag200			16
) pci_0000_	_3b_00_1	Mellanox Technologies (0x15b3)	MT28800 Family [ConnectX-5 Ex] (0x1019)	mlx5_core			66
] pci_0000_	_3b_00_0	Mellanox Technologies (0x15b3)	MT28800 Family [ConnectX-5 Ex] (0x1019)	mlx5_core			65
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The second second	Name Vendor		FIGURE	Diliver	currently in use by	According to Allia	ionino aroa
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pci_0000_	18_00_0	Broadcom / LSI (0x1000)	MegaRAID SAS-3 3008 [Fury] (0x005f)	megaraid_sas			32

StarWind VSAN CVM.

4. Login to StarWind VSAN VM web console and access the Storage section. Locate the recently added disk in the Drives section and choose it.



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stanwindvsa-34 System Logs	KIB/s Reading KIB/s Writing 96 64 32 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	RAID Devices No storage set up as RAID Volume Groups									
Storage	20.37 20.38 20.39 20.40 20.41 20.37 20.38 20.39 20.40 20.41		centos 14.8 GiB								
Networking Accounts	Hilesystems Name Mount Point Size	VDO Devices +									
Services	/dev/centos/root / 2.92 / 13.2 GIB		No storage set up	as VDO							
Terminal	/dev/sda2 /boot 235 / 1014 MiB	Drives									
	Storage Logs May 8, 2023	1	Msft Virtual Disk (600 16 GiB Hard Disk R: 0 B/s W: 0 B/s	224806							
	20:40 g_object_notify: object class 'UDisksLinuxBlockObjec_ udisksd 20: 20:40 g_object_notify: object class 'UDisksLinuxBlockObjec_ udisksd 20: 20:40 g_object_notify: object class 'UDisksLinuxUogicalVol_ udisksd 20: 20:40 g_object_notify: object class 'UDisksLinuxVolumeGrou udisksd 20:40 g_object_notify: object class 'UDisksLinuxVolumeGrou udisksd 20:40 g_object_notify: object class 'UDisksObjectSkeleton'- udisksd 20: 20:40 Loading module libudisks2_lvm2.so udisksd										

5. The added disk does not have any partitions and filesystem. Press the Create Partition Table button to create the partition.

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STARWIND VIRTUAL SAN						💄 us	er 🗸
starwindvsa-34	Storage > VMware Virtual disk (6000c2922	debd1cf1f227ad001f11438) Format Disk /dev/sdb					
System Logs Storage Networking Accounts Services Terminal	Drive Model Virtual disk Firmware Version 2.0 Serial Number 6000c2922debd1 World Wide Name 0x6000c2922deb Capacity 100 GiB, 107 GB, Device File /dev/sdb	Erase Don't overwrite existing data Partitioning Compatible with modern system and hard disks > 2TB (GPT) Formatting a disk v	vill erase all data on it. Cancel Format	Con	te Partitio	Table	
	> 100 GiB Unrecognized Data	/dev/	sdb				

6. Press Create Partition to format the disk and set the mount point. The mount point should be as follows: /mnt/%yourdiskname%



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starwindvsa-34	Storage > VMware Virtual disk (6000c29	22debd1cf1f227ad00 Create Partitio	01f11438) n on /dev/sdb						
System Logs Storage Networking Accounts Services Terminal	Drive Model Virtual disk Firmware Version 2.0 Serial Number 6000c2922debd World Wide Name 0x6000c2922deb Capacity 100 GiB, 107 GB, Device File /dev/sdb Content 100 GiB Free Space	Size Erase Type Name Mount Options	100 Gi Don't overwrite existing data XF5 - Recommended default disk1 Encrypt data Custom /mnt/disk1 Mount read only Custom mount options noatime Cancel Create Pa	B v v v		Cre	ate Partiti	on Table	

7. On the Storage section, under Content, navigate to the Filesystem tab. Click Mount.

Image: Constraint of the service se	
Starwindvsa-34 Privileged System Model Virtual disk (6000c2922debd1cff227ad001f11438) Cigs Drive System Model Virtual disk Logs Steriage > UMware Version 2.0 Sterial Number 6000c2922debd1cf1f227ad001f11438 Networking World Wird Name 0.s6000c2922debd1cf1f227ad001f11438 Accounts Capacity 100 GB, 107 GB, 107374182400 bytes Device File /dev/sdb Device File /dev/sdb	≡
Storage > VMware Virtual disk (6000-2922debd1cf1f227ad001f11438) System Logs Storage Networking Accounts Services	ser ~
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Logs Model Virtual disk Logs Firmware Version 2.0 Storage Serial Number 6000c2922debd1cf1227ad001f11438 Networking World Wide Name 0x6000c2922debd1cf1227ad001f11438 Accounts Capacity 100 GiB, 107 GB, 107374182400 bytes Device File /dewisdb Device File /dewisdb	
Storage Serial Number 6000:2922debd1cf1227ad001f11438 Networking World Wide Name 0x6000:2922debd1cf1227ad001f11438 Accounts Capacity 100 GiB, 107 GB, 107374182400 bytes Device File / dev/sdb Device File / dev/sdb	
Networking World Wide Name 0x6000z2922debd1cff227ad001ff1438 Accounts Capacity 100 GiB, 107 GB, 107374182400 bytes Device File /dew/sdb	
Accounts Capacity 100 GB, 107 GB, 107374182400 bytes Device File /dev/sdb Terminal	
Terminal	
Terminal	
Content Create Partition Table	
✓ 100 GiB xfs File System //dev/sdb1	
Partition Filesystem Delete Forme	
Name disk1 Mount Point /mnt/disk1 Mount Options noatime Used -	

Configuring Starwind Management Components

1. Install StarWind Management Console on each server or on a separate 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. 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.



3. 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.), StarWindX PowerShell library can be used. StarWind Management Console can be used to monitor StarWind Virtual SAN Service.

Creating Starwind Ha Luns Using Powershell

1. Open PowerShell ISE as Administrator.



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



2. Configure script parameters according to the following example:



```
$storageName="",
        $targetAlias="target02",
        $autoSynch=$true,
        $poolName="pool1",
        $syncSessionCount=1,
        $aluaOptimized=$true,
        $cacheMode="none",
        $cacheSize=0,
        $syncInterface="#p2={0}:3260" -f "172.16.20.20",
        $hbInterface="#p2={0}:3260" -f "172.16.10.20",
        $createTarget=$true,
        $bmpFolderPath="",
#secondary node
        $imagePath2="VSA Storage\mnt\crypted1",
        $imageName2="testha02",
        $createImage2=$true,
        $storageName2="",
        $targetAlias2="target02",
        $autoSynch2=$true,
        $poolName2="pool1",
        $syncSessionCount2=1,
        $aluaOptimized2=$false,
        $cacheMode2=$cacheMode,
        $cacheSize2=$cacheSize,
        $syncInterface2="#p1={0}:3260" -f "172.16.20.10",
        $hbInterface2="#p1={0}:3260" -f "172.16.10.10",
        $createTarget2=$true,
        $bmpFolderPath2=""
Import-Module StarWindX
try
{
        Enable-SWXLog -level SW LOG LEVEL DEBUG
        $server = New-SWServer -host $addr -port $port -user
$user -password $password
        $server.Connect()
        $firstNode = new-Object Node
        $firstNode.HostName = $addr
        $firstNode.HostPort = $port
```



```
$firstNode.Login = $user
        $firstNode.Password = $password
        $firstNode.ImagePath = $imagePath
        $firstNode.ImageName = $imageName
        $firstNode.Size = $size
        $firstNode.CreateImage = $createImage
        $firstNode.StorageName = $storageName
        $firstNode.TargetAlias = $targetAlias
        $firstNode.AutoSynch = $autoSynch
        $firstNode.SyncInterface = $syncInterface
        $firstNode.HBInterface = $hbInterface
        $firstNode.PoolName = $poolName
        $firstNode.SyncSessionCount = $syncSessionCount
        $firstNode.ALUAOptimized = $aluaOptimized
        $firstNode.CacheMode = $cacheMode
        $firstNode.CacheSize = $cacheSize
        $firstNode.FailoverStrategy = $failover
        $firstNode.CreateTarget = $createTarget
        $firstNode.BitmapStoreType = $bmpType
        $firstNode.BitmapStrategy = $bmpStrategy
        $firstNode.BitmapFolderPath = $bmpFolderPath
        #
        # device sector size. Possible values: 512 or 4096(May
be incompatible with some clients!) bytes.
        #
        $firstNode.SectorSize = $sectorSize
        $secondNode = new-Object Node
        $secondNode.HostName = $addr2
        $secondNode.HostPort = $port2
        $secondNode.Login = $user2
        $secondNode.Password = $password2
        $secondNode.ImagePath = $imagePath2
        $secondNode.ImageName = $imageName2
        $secondNode.CreateImage = $createImage2
        $secondNode.StorageName = $storageName2
        $secondNode.TargetAlias = $targetAlias2
        $secondNode.AutoSynch = $autoSynch2
        $secondNode.SyncInterface = $syncInterface2
        $secondNode.HBInterface = $hbInterface2
        $secondNode.SyncSessionCount = $syncSessionCount2
        $secondNode.ALUAOptimized = $aluaOptimized2
        $secondNode.CacheMode = $cacheMode2
        $secondNode.CacheSize = $cacheSize2
```



```
$secondNode.FailoverStrategy = $failover
        $secondNode.CreateTarget = $createTarget2
        $secondNode.BitmapFolderPath = $bmpFolderPath2
        $device = Add-HADevice -server $server -firstNode
$firstNode -secondNode $secondNode -initMethod $initMethod
        while ($device.SyncStatus -ne
[SwHaSyncStatus]::SW_HA_SYNC_STATUS_SYNC)
        {
                $syncPercent =
$device.GetPropertyValue("ha synch percent")
                Write-Host "Synchronizing: $($syncPercent)%" -
foreground yellow
                Start-Sleep -m 2000
                $device.Refresh()
        }
}
catch
{
        Write-Host $_ -foreground red
}
finally
{
        $server.Disconnect()
}
```

Detailed explanation of script parameters:

```
-addr, -addr2 — partner nodes IP address.
Format: string. Default value: 192.168.0.1, 192.168.0.1
allowed values: localhost, IP-address
-port, -port2 — local and partner node port.
Format: string. Default value: 3261
-user, -user2 — local and partner node user name.
Format: string. Default value: root
-password, -password2 — local and partner node user password.
Format: string. Default value: starwind
```

#common
-initMethod Format: string. Default value: Clear
-size - set size for HA-devcie (MB)
Format: integer. Default value: 12



-sectorSize – set sector size for HA-device Format: integer. Default value: 512 allowed values: 512, 4096 -failover - set type failover strategy Format: integer. Default value: 0 (Heartbeat) allowed values: 0, 1 (Node Majority) -bmpType – set bitmap type, is set for both partners at once Format: integer. Default value: 1 (RAM) allowed values: 1, 2 (DISK) -bmpStrategy - set journal strategy, is set for both partners at once Format: integer. Default value: 0 allowed values: 0, 1 - Best Performance (Failure), 2 - Fast Recovery (Continuous) *#primary node* -imagePath - set path to store the device file Format: string. Default value: My computer\C\starwind". For Linux the following format should be used: "VSA Storage\mnt\mount point" -imageName - set name device Format: string. Default value: masterImg21 -createlmage - set create image file Format: boolean. Default value: true -targetAlias - set alias for target Format: string. Default value: targetha21 -poolName – set storage pool Format: string. Default value: pool1 -aluaOptimized - set Alua Optimized Format: boolean. Default value: true -cacheMode - set type L1 cache (optional parameter) Format: string. Default value: wb allowed values: none, wb, wt -cacheSize - set size for L1 cache in MB (optional parameter) Format: integer. Default value: 128 allowed values: 1 and more -syncInterface – set sync channel IP-address from partner node Format: string. Default value: "#p2={0}:3260" -hbInterface - set heartbeat channel IP-address from partner node Format: string. Default value: "" -createTarget - set creating target Format: string. Default value: true Even if you do not specify the parameter -createTarget, the target will be created automatically. If the parameter is set as -createTarget \$false, then an attempt will be made to create the device with existing targets, the names of which are specified in the -targetAlias (targets must already be created)



-bmpFolderPath – set path to save bitmap file Format: string.

#secondary node -imagePath2 - set path to store the device file Format: string. Default value: "My computer\C\starwind". For Linux the following format should be used: "VSA Storage\mnt\mount point" -imageName2 - set name device Format: string. Default value: masterImg21 -createlmage2 - set create image file Format: boolean. Default value: true -targetAlias2 - set alias for targetFormat: string. Default value: targetha22 -poolName2 – set storage pool Format: string. Default value: pool1 -aluaOptimized2 - set Alua Optimized Format: boolean. Default value: true -cacheMode2 - set type L1 cache (optional parameter) Format: string. Default value: wb allowed values: wb. wt -cacheSize2 – set size for L1 cache in MB (optional parameter) Format: integer. Default value: 128 allowed values: 1 and more -syncInterface2 - set sync channel IP-address from partner node Format: string. Default value: "#p1={0}:3260" -hbInterface2 - set heartbeat channel IP-address from partner node Format: string. Default value: "" -createTarget2 - set creating target Format: string. Default value: true Even if you do not specify the parameter -createTarget, the target will be created automatically. If the parameter is set as -createTarget \$false, then an attempt will be made to create the device with existing targets, the names of which are specified in the targetAlias (targets must already be created) -bmpFolderPath2 – set path to save bitmap file Format: string.

Selecting The Failover Strategy

StarWind provides 2 options for configuring a failover strategy:

Heartbeat

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

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

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

Node Majority

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

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

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

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

Provisioning Starwind Ha Storage To Hosts

1. Login to Engine and open Storage -> Domain. Click New Domain.



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2. Choose Storage Type – iSCSI, Host and Name of Storage Domain. Discover targets via iSCSI links, which were previously configured. Click Login All.

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3. Add LUN from each iSCSI target. Click OK.



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4. Storage Domain will be added to the list of Domain and can be used as a storage for VMs.

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5. Login to each host and verify that multipathing policy has been applied using the following command.

multipath -ll

```
[root@sw-demo-node-01 ~]# multipath -ll
22ebelf66db375fb0 dm-13 STARWIND,STARWIND
size=500G features='1 queue_if_no_path' hwhandler='1 alua' wp=rw
`-+- policy='round-robin 0' prio=50 status=active
|- 16:0:0:0 sdb 8:16 active ready running
`- 17:0:0:0 sdc 8:32 active ready running
```

Conclusion

Deploying and configuring StarWind Virtual SAN for the Oracle Linux Virtualization Manager (OLVM) is a new move for organizations seeking a powerful KVM-based VMcentric storage solution. This guide ensures that IT professionals have the information to perform a successful setup of StarWind VSAN for OLVM.



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