

StarWind Virtual HCI Appliance: Configuration Guide for Microsoft Windows Server [Hyper-V], VHCA Deployed using Automated Installation

2024

TECHNICAL PAPERS



Trademarks

“StarWind”, “StarWind Software” and the StarWind and the StarWind Software logos are registered trademarks of StarWind Software. “StarWind LSFS” is a trademark of StarWind Software which may be registered in some jurisdictions. All other trademarks are owned by their respective owners.

Changes

The material in this document is for information only and is subject to change without notice. While reasonable efforts have been made in the preparation of this document to assure its accuracy, StarWind Software assumes no liability resulting from errors or omissions in this document, or from the use of the information contained herein. StarWind Software reserves the right to make changes in the product design without reservation and without notification to its users.

Technical Support and Services

If you have questions about installing or using this software, check this and other documents first - you will find answers to most of your questions on the [Technical Papers](#) webpage or in [StarWind Forum](#). If you need further assistance, please [contact us](#) .

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.

Copyright ©2009-2018 StarWind Software Inc.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior written consent of StarWind Software.

Annotation

Relevant products

StarWind Virtual HCI Appliance (VHCA)

Purpose

This document outlines how to configure a StarWind Virtual HCI Appliance (VHCA) based on Microsoft Windows Server, with VSAN running as a Controller Virtual Machine (CVM). The guide includes steps to prepare Hyper-V 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 Microsoft Windows Server 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>

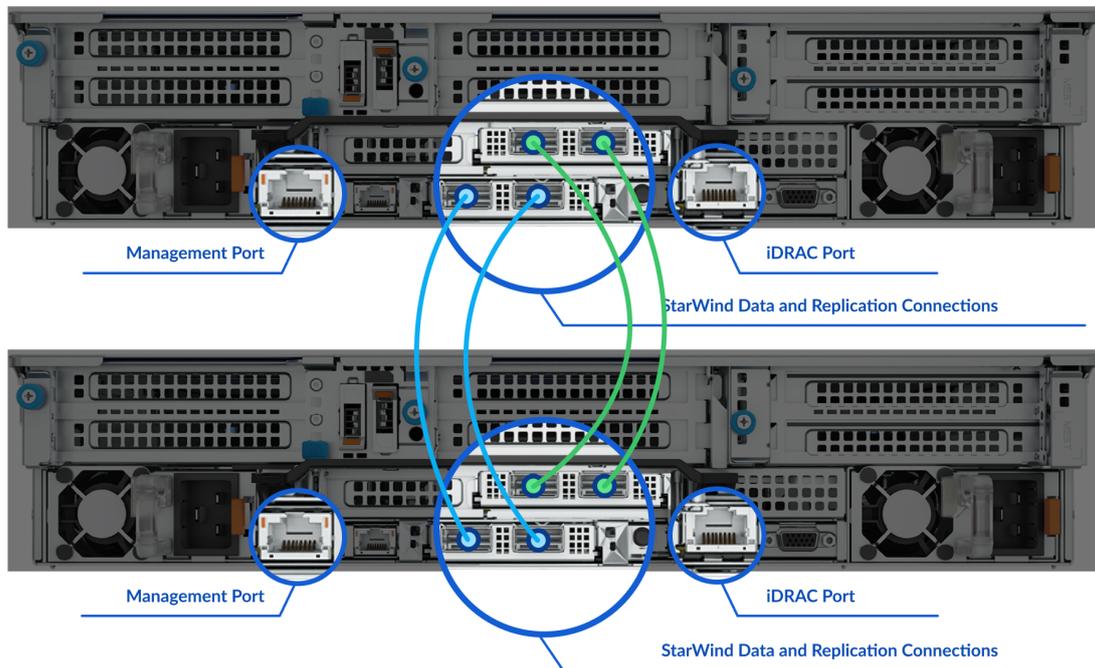
Recommended RAID settings for HDD and SSD disks:

<https://knowledgebase.starwindsoftware.com/guidance/recommended-raid-settings-for-hdd-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 Microsoft Windows Server and StarWind VSAN Controller Virtual Machine. CVM utilizes local storage to create replicated shared storage connected to Windows Server 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]

System BIOS Settings • Boot Settings

Boot Mode BIOS UEFI
 Boot Sequence Retry Enabled Disabled Reset

2. Enable AC Power Recovery to On;

AC Power Recovery Last On Off

3. 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 Disabled
Apply Changes

5. Enable SR-IOV for network cards;

Integrated NIC 1 Port 1: Mellanox ConnectX-4 LX 25GbE SFP Rack NDC - 0C:42:A1F3: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	<input checked="" type="radio"/> RAID1
Stripe Size	<input checked="" type="radio"/> 64K
Virtual Disk Size	223GB
Quick Initialization	<input type="radio"/> No <input checked="" type="radio"/> Yes
Name	<input type="text" value="OS"/>
Would you like to create this virtual disk?	<input type="radio"/> No <input checked="" type="radio"/> Yes

[\[Next\]](#)

Storage for data:

Supported RAID configurations for main data storage you can find [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 vHCI 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	Type
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

Create StarWind Files folder and copy scripts:

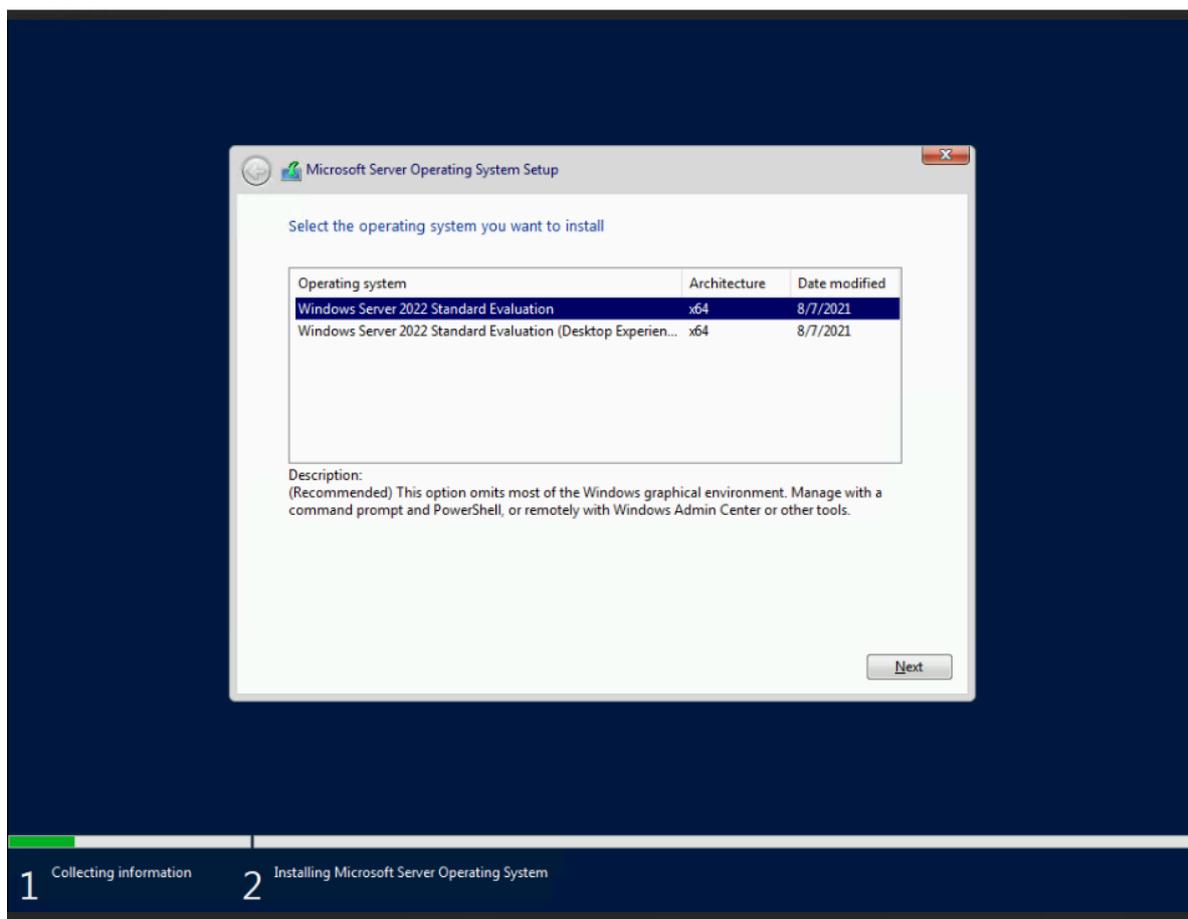
C:\StarWind Files\ConfigurationScript.ps1
 C:\StarWind Files\PostInstall.ps1
 C:\StarWind Files\Write-Menu.ps1
 C:\StarWind Files\CheckFirmwareUpdates.ps1
 C:\StarWind Files\InstallDellFirmwareupdate.ps1

Scripts that are included in the “StarWind Folders.ps1” script.

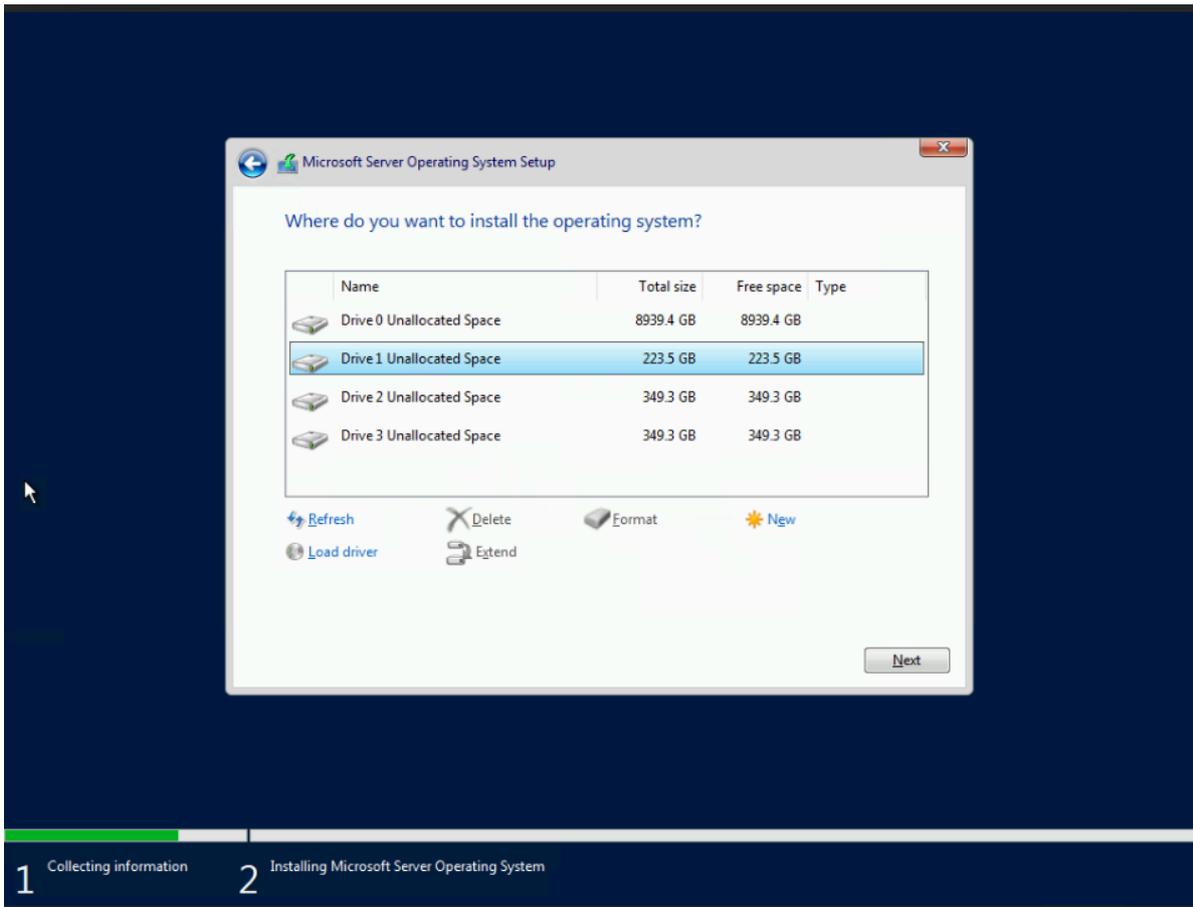
C:\StarWind Files\Temp\ISOs Download.ps1
 ISOs Download.ps1 allows to download the customized ISOs and OVF for vHCI configuration:
 Windows 2019/2022

Install Windows

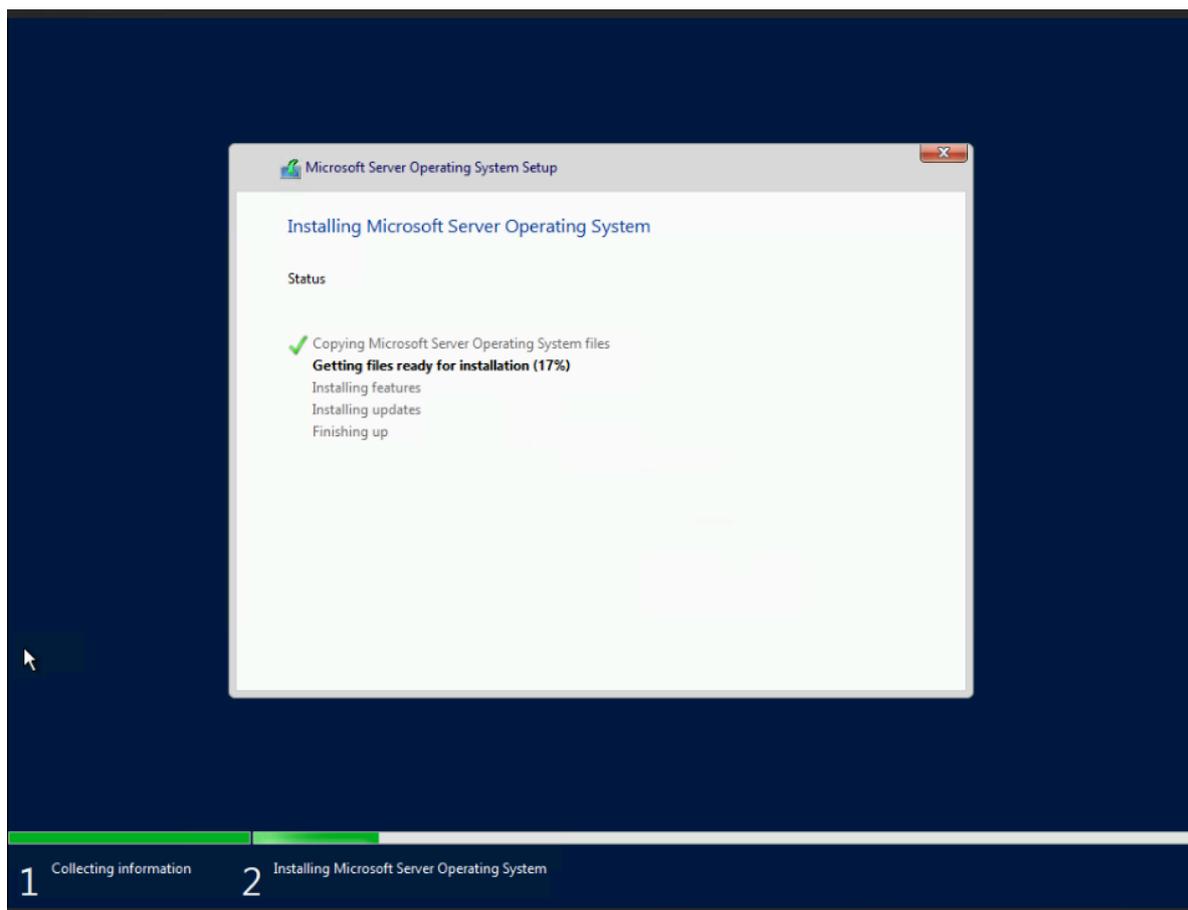
1. Mount the ISO to the iDRAC/IPMI from the folder C:\StarWind Files\ISOs.
2. Start the server to boot/install the OS.
3. Choose the Core or GUI version of the OS.



4. Choose the drive for OS.



5. Wait for installation.



Windows Configuration

1. During the first boot, the PostInstall.ps1 script will start.
2. Choose the components according to the hardware provider.
3. DELL

```

Select components to install
[X] 0.Install Prerequisites
[X] 1.0.Install StarWind VSAN
[X] 1.1.Install StarWind Health Service
[ ] 1.2.Install StarWind Management Console
[ ] 1.3. Install StarWind VTL and Cloud
[ ] 1.4.Install StarWind SLA
[ ] 2.0.Install VMware stuff
[X] 3.Install Mellanox Drivers
[X] 4.0.Install Dell Software
[ ] 4.1.Install MegaRaid
[X] 5.Install GoogleChrome
[X] 6.Install Roles And Features
[X] 7.Install Intel NICs drivers
[X] 8.Reboot HOST after install
  
```

SuperMicro

```

Select components to install
[X] 0.Install Prerequisites
[X] 1.0.Install StarWind VSAN
[X] 1.1.Install StarWind Health Service
[ ] 1.2.Install StarWind Management Console
[ ] 1.3. Install StarWind VTL and Cloud
[ ] 1.4.Install StarWind SLA
[ ] 2.0.Install VMware stuff
[X] 3.Install Mellanox Drivers
[ ] 4.0.Install Dell Software
[X] 4.1.Install MegaRaid
[X] 5.Install GoogleChrome
[X] 6.Install Roles And Features
[X] 7.Install Intel NICs drivers
[X] 8.Reboot HOST after install
  
```

Other

```

Select components to install
[X] 0.Install Prerequisites
[ ] 1.0.Install StarWind VSAN
[X] 1.1.Install StarWind Health Service
[X] 1.2.Install StarWind Management Console
[ ] 1.3. Install StarWind VTL and Cloud
[ ] 1.4.Install StarWind SLA
[ ] 2.0.Install VMware stuff
[X] 3.Install Mellanox Drivers
[ ] 4.0.Install Dell Software
[ ] 4.1.Install MegaRaid
[X] 5.Install GoogleChrome
[X] 6.Install Roles And Features
[X] 7.Install Intel NICs drivers
[X] 8.Reboot HOST after install
    
```

4. Choose the number of the node.

Node 1

```

Set the name of the host
Enter the index of the current node: 1
Host name WIN-7H3L13QU8F9...FALSE
Would you like to change the hostname? [y/n]: y
Enter the Appliance type: Windows-VSAN-VSA(1); ESXi-VSAN(2); Windows-Backup-VTL(3); Windows-Backup-V
eeam(4); Windows-Backup(5); ESXi-Backup(6); Windows-DR(7); ESXi-DR(8);: 1
    
```

Node 2

```

Set the name of the host
Enter the index of the current node: 2
Host name WIN-HA0920BC3MV...FALSE
Would you like to change the hostname? [y/n]: y
Enter the Appliance type: Windows-VSAN-VSA(1); ESXi-VSAN(2); Windows-Backup-VTL(3); Windows-Backup-V
eeam(4); Windows-Backup(5); ESXi-Backup(6); Windows-DR(7); ESXi-DR(8);: 1
    
```

5. Choose the disk via the number for the S drive. (StarWind devices storage)

```

Checking and configuring storage disk
-----
Storage is not available
Configure Storage disk [y/n]: y
Number F Serial Number HealthStatus OperationalStatus Total Size Pa
rtit
ion
Styl
e
Name
-----
0 D 819f2a86a7e30010 Healthy Online 223.51 GB GP
3 D 00a3469a264ca9c42b00c6093e80e04e Healthy Online 8.73 TB GP
2 D 5CD2_E4CF_3F46_0100. Healthy Online 349.32 GB RA
1 D 5CD2_E416_0B43_0100. Healthy Online 349.32 GB RA
4 L 1028 123456 Healthy Online 308 MB MB
5 L 1028 123451 Healthy No Media 0 B RA
Enter the required number value: 3
    
```

6. Choose the archive disk number. (Video Appliance)

```
Checking and configuring archive disk
Archive is not available
Configure Archive disk? [y/n]: n
```

7. Click on "I do not agree to the terms of this agreement. (The customer should do it during the final check)

StarWind LICENSE AGREEMENT

Welcome to your StarWind Appliance!

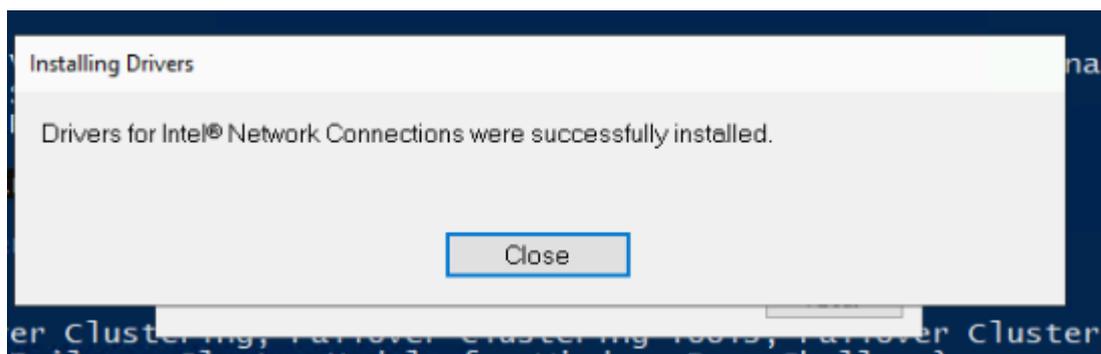
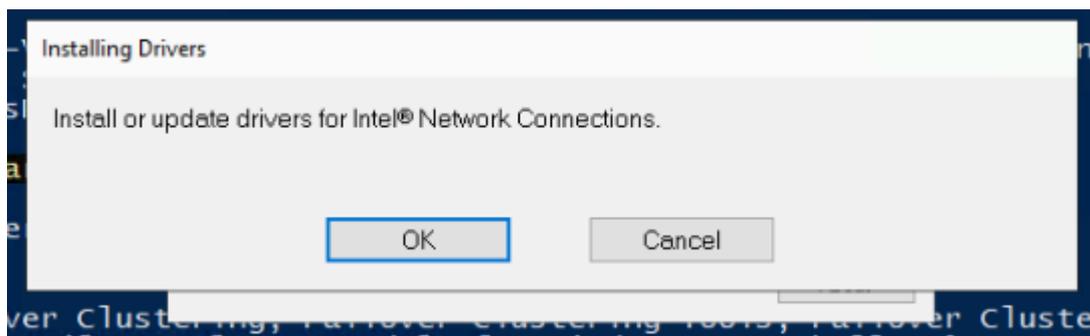
You must accept the **StarWind License Agreement** before continuing using the Appliance

This StarWind License Agreement (the "**Agreement**") is a legal agreement between the entity indicated on the signature page as 'Licensee' or the licensee entity on whose behalf this Agreement is electronically executed by the authorized user (the "**Licensee**") and StarWind Software, Inc., a State of Delaware, USA corporation ("**StarWind**," and collectively with Licensee, the "**Parties**" and each, (a "**Party**"), that is entered into as of the date of acceptance hereof by both Parties hereto (the "**Effective Date**").

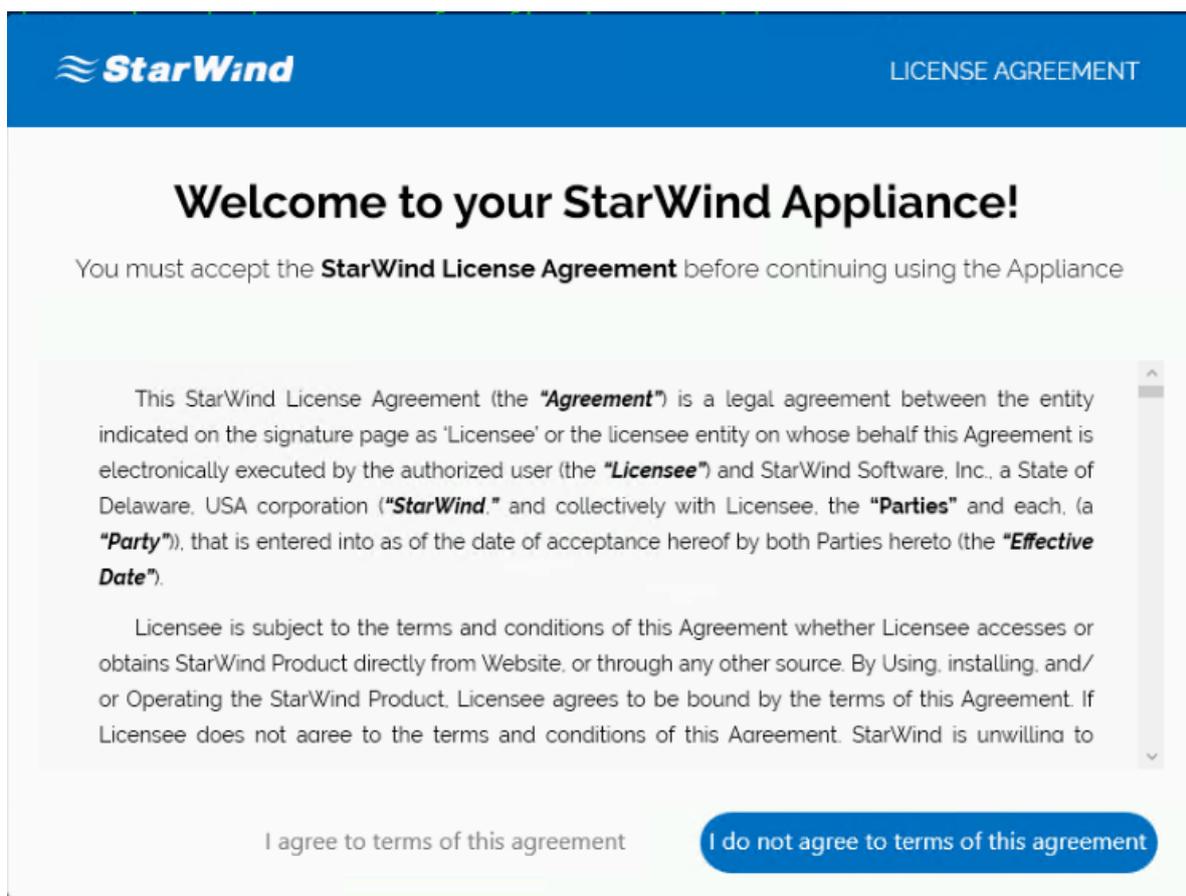
Licensee is subject to the terms and conditions of this Agreement whether Licensee accesses or obtains StarWind Product directly from Website, or through any other source. By Using, installing, and/or Operating the StarWind Product, Licensee agrees to be bound by the terms of this Agreement. If Licensee does not agree to the terms and conditions of this Agreement, StarWind is unwilling to

I agree to terms of this agreement I do not agree to terms of this agreement

8. Proceed with Intel drivers installation. (drivers will be updated only in case of Intel networks availability)



9. Wait for the servers to restart.
10. Click on "I do not agree to the terms of this agreement. (The customer should do it during the final check)



11. The Configuration Script.ps1 will start after the restart.

12. Choose the number of the node and partner, as well as number of the iSCSI and Synchronization network ports.

Node 1

```
Enter the index of the current node: 1
Enter the index of the target node: 2
Enter the number of iSCSI interfaces (1 or 2): 1
Enter the number of sync interfaces (1 or 2): 1
```

Node 2

```

Enter the index of the current node: 2
Enter the index of the target node: 1
Enter the number of iSCSI interfaces (1 or 2): 1
Enter the number of sync interfaces (1 or 2): 1
    
```

13. Set the network interfaces for Management, iSCSI, and Synchronization.

```

Checking and configuring network interfaces
-----
Management interfaces...False.
Management interface is not configured. Would you like to configure it? [y/n]: y

Name                InterfaceDescription                ifIndex Status      MacAddress
-----
SLOT 7 Port 3       Intel(R) Ethernet Network Adapter X7... 11 Disconnected B4-96-91-...
SLOT 7 Port 2       Intel(R) Ethernet Network Adapter ...#2 10 Disconnected B4-96-91-...
NIC1                 Mellanox ConnectX-4 Lx Ethernet Ad...#2 9 Up          0C-42-A1-...
SLOT 7 Port 1       Intel(R) Ethernet 10G 4P X710-T4L-t ... 7 Up          B4-96-91-...
NIC2                 Mellanox ConnectX-4 Lx Ethernet Adapter 6 Up          0C-42-A1-...
SLOT 7 Port 4       Intel(R) Ethernet Network Adapter ...#3 4 Disconnected B4-96-91-...

Enter the required interface's ifIndex value: 7
iscsi-1 interface...False.
iscsi-1 interface is not configured. Would you like to configure it? [y/n]: y

SLOT 7 Port 3       Intel(R) Ethernet Network Adapter X7... 11 Disconnected B4-96-91-...
SLOT 7 Port 2       Intel(R) Ethernet Network Adapter ...#2 10 Disconnected B4-96-91-...
NIC1                 Mellanox ConnectX-4 Lx Ethernet Ad...#2 9 Up          0C-42-A1-...
management          Intel(R) Ethernet 10G 4P X710-T4L-t ... 7 Up          B4-96-91-...
NIC2                 Mellanox ConnectX-4 Lx Ethernet Adapter 6 Up          0C-42-A1-...
SLOT 7 Port 4       Intel(R) Ethernet Network Adapter ...#3 4 Disconnected B4-96-91-...

Enter the required interface's ifIndex value: 9
sync-1 interface...False.
sync-1 interface is not configured. Would you like to configure it? [y/n]: y

SLOT 7 Port 3       Intel(R) Ethernet Network Adapter X7... 11 Disconnected B4-96-91-...
SLOT 7 Port 2       Intel(R) Ethernet Network Adapter ...#2 10 Disconnected B4-96-91-...
iscsi-12-1          Mellanox ConnectX-4 Lx Ethernet Ad...#2 9 Dormant      0C-42-A1-...
management          Intel(R) Ethernet 10G 4P X710-T4L-t ... 7 Up          B4-96-91-...
NIC2                 Mellanox ConnectX-4 Lx Ethernet Adapter 6 Up          0C-42-A1-...
SLOT 7 Port 4       Intel(R) Ethernet Network Adapter ...#3 4 Disconnected B4-96-91-...

Enter the required interface's ifIndex value: 6
    
```

14. Perform step 13 on both servers.

15. Check the iSCSI and Synchronization availability to communicate.

```

Check the availability of the partner node and jumbo packet passthrough
-----
Is partner node configured? [y/h]: y
Node partner available...OK.
iscsi-1 jumbo packets passthrough was successful
sync-1 jumbo packets passthrough was successful
    
```

16. Add iSCSI support for MPIO.

```

-----
Checking Roles and Features
-----
Hyper-V Role...OK
Failover Clustering...OK
MultiPathIO...OK
MultiPathIO support for iscsi...FALSE
You want to install MultiPathIO support for iscsi? [y/n]: y

```

17. Choose to restart a server. (run a script again in case you had issues during the first run)

```

Run the script after restart
-----
Do you want the script to run after a restart? [y/n]: n
Would you like to reboot the server? [y/n]: y_

```

Starwind Devices Creation

1. Copy the StarWind License key of the first node to the folder C:\HCA
2. Go to the folder C:\HCA\SW_Scripts_Wind and run the 3.0 script on both nodes
3. Run 3.2 script from the first node
4. Run 3.3 script on the first node to create StarWind devices (v14 for StarWind before the 15000 build / v15 for StarWind after the 15000 build)
5. Run 3.4 script on both nodes
6. Run 3.5 script on the first node to connect StarWind iSCSI targets on both nodes
7. Run 3.6 script to create a partition on top of StarWind devices

Conclusion

Following this guide, a StarWind Virtual HCI Appliance (VHCA) powered by Microsoft Windows Server 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.

Contacts

US Headquarters	EMEA and APAC
 +1 617 829 44 95	 +44 2037 691 857 (United Kingdom)
 +1 617 507 58 45	 +49 800 100 68 26 (Germany)
 +1 866 790 26 46	 +34 629 03 07 17 (Spain and Portugal)
	 +33 788 60 30 06 (France)

Customer Support Portal: <https://www.starwind.com/support>

Support Forum: <https://www.starwind.com/forums>

Sales: sales@starwind.com

General Information: info@starwind.com



StarWind Software, Inc. 100 Cummings Center Suite 224-C Beverly MA 01915, USA
www.starwind.com ©2024, StarWind Software Inc. All rights reserved.