

StarWind Virtual SAN: Configuration Guide for VMware vSphere [ESXi], VSAN Deployed as a Controller Virtual Machine (CVM) using Web UI

2024

TECHNICAL PAPERS



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About StarWind

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

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Annotation

Relevant Products

StarWind Virtual SAN (VSAN)

Purpose

This guide provides a comprehensive outline on how to deploy and configure StarWind Virtual SAN within the VMware vSphere environment and create StarWind devices using the Web UI. It includes links to the system requirements, RAID settings, best practices, and steps to ensure a seamless setup and integration.

Audience

The guide is created for IT specialists, system administrators, and VMware professionals who are keen on deploying and configuring StarWind Virtual SAN on VMware vSphere.

Expected Result

Users will possess a robust understanding of the steps and best practices for deploying and configuring StarWind Virtual SAN in a VMware vSphere environment.

Starwind Virtual San For Vsphere Vm Requirements

Prior to installing StarWind Virtual SAN Virtual Machines, 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:

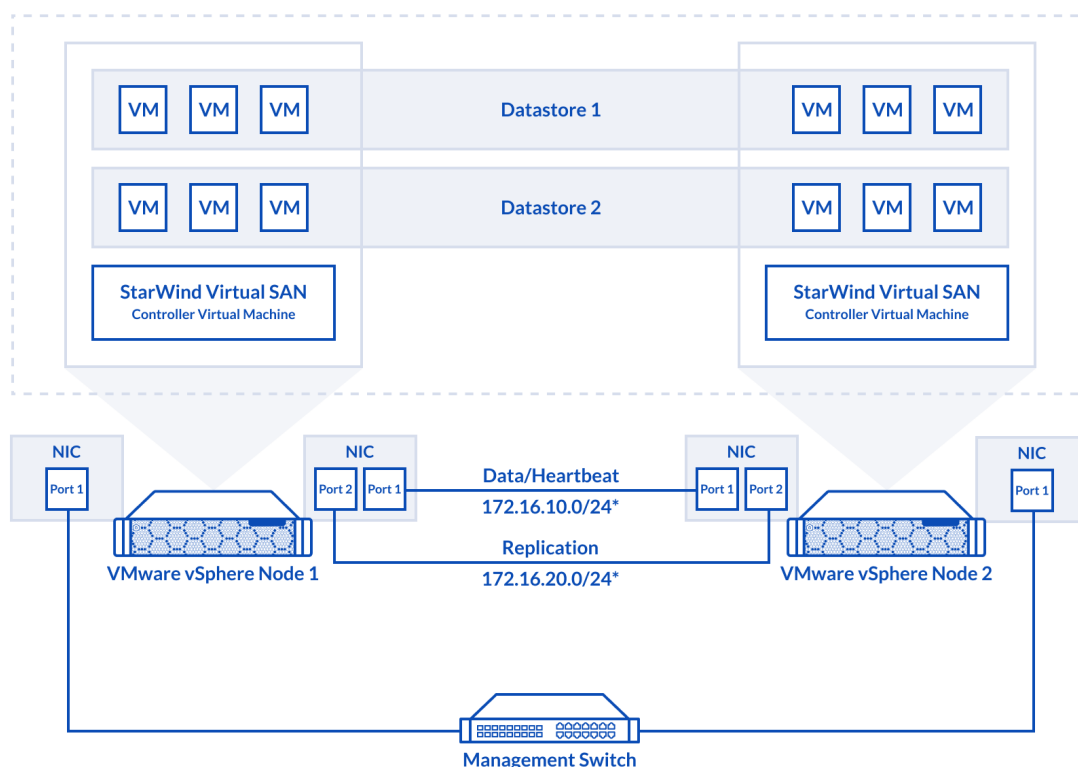
<https://knowledgebase.starwindsoftware.com/guidance/recommended-raid-settings-for-hdd-and-ssd-disks/>

Please read StarWind Virtual SAN Best Practices document for additional information:

<https://www.starwindsoftware.com/resource-library/starwind-virtual-san-best-practices>

Pre-Configuring The Servers

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



1. ESXi hypervisor should be installed on each host.
2. StarWind Virtual SAN for vSphere VM should be deployed on each ESXi host from an OVF template, downloaded on this page:
<https://www.starwindsoftware.com/release-notes-build-vsant-for-vmware-vsphere>
3. 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.
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.

vCenter Server can be deployed separately on another host or as VCSA on StarWind

VSAN highly-available storage, created in this guide.

Preparing Environment For Starwind Vsan Deployment

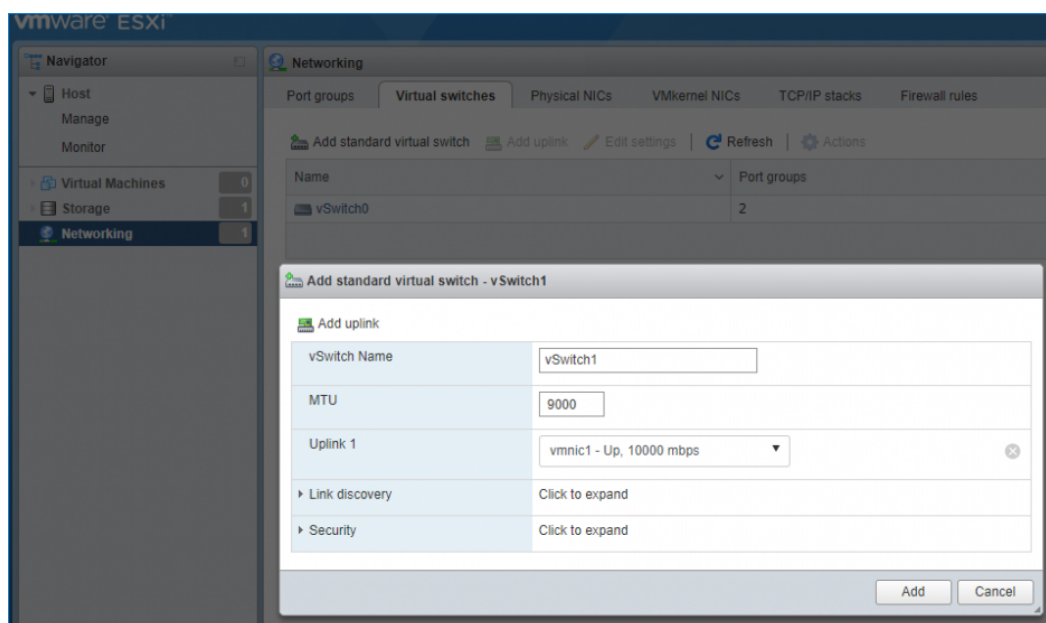
Configuring Networks

Configure network interfaces on each node to make sure that Synchronization and iSCSI/StarWind heartbeat interfaces are in different subnets and connected physically according to the network diagram above. All actions below should be applied to each ESXi server.

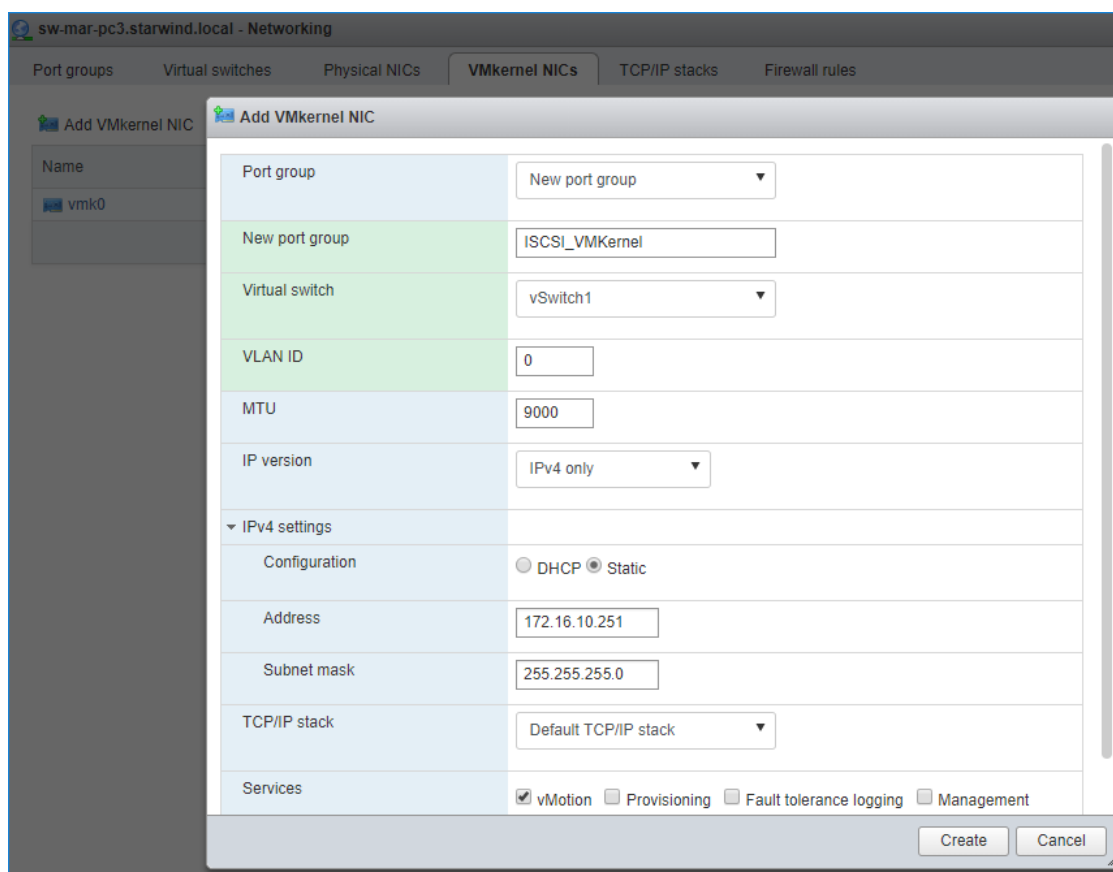
NOTE: Virtual Machine Port Group should be created for both iSCSI/ StarWind Heartbeat and the Synchronization vSwitches. VMKernel port should be created only for iSCSI traffic. Static IP addresses should be assigned to VMKernel ports.

NOTE: It is recommended to set MTU to 9000 on vSwitches and VMKernel ports for iSCSI and Synchronization traffic. Additionally, vMotion can be enabled on VMKernel ports.

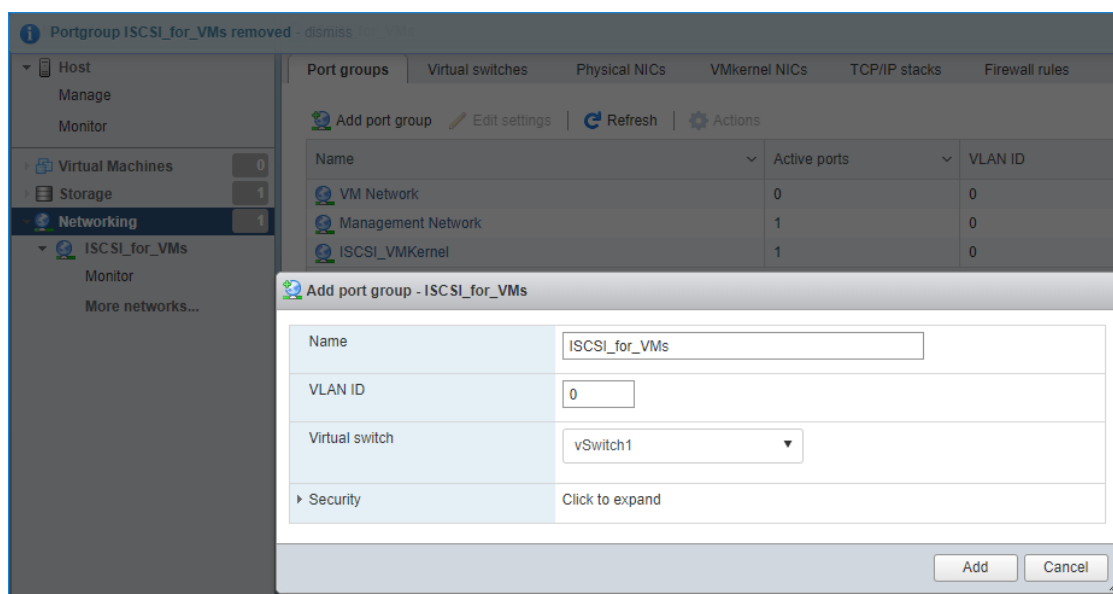
1. Using the VMware ESXi web console, create two standard vSwitches: one for the iSCSI/ StarWind Heartbeat channel (vSwitch1) and the other one for the Synchronization channel (vSwitch2).



2. Create a VMKernel port for the iSCSI/ StarWind Heartbeat channel.



3. Add a Virtual Machine Port Groups on the vSwitch for iSCSI traffic (vSwitch1) and on the vSwitch for Synchronization traffic (vSwitch2).

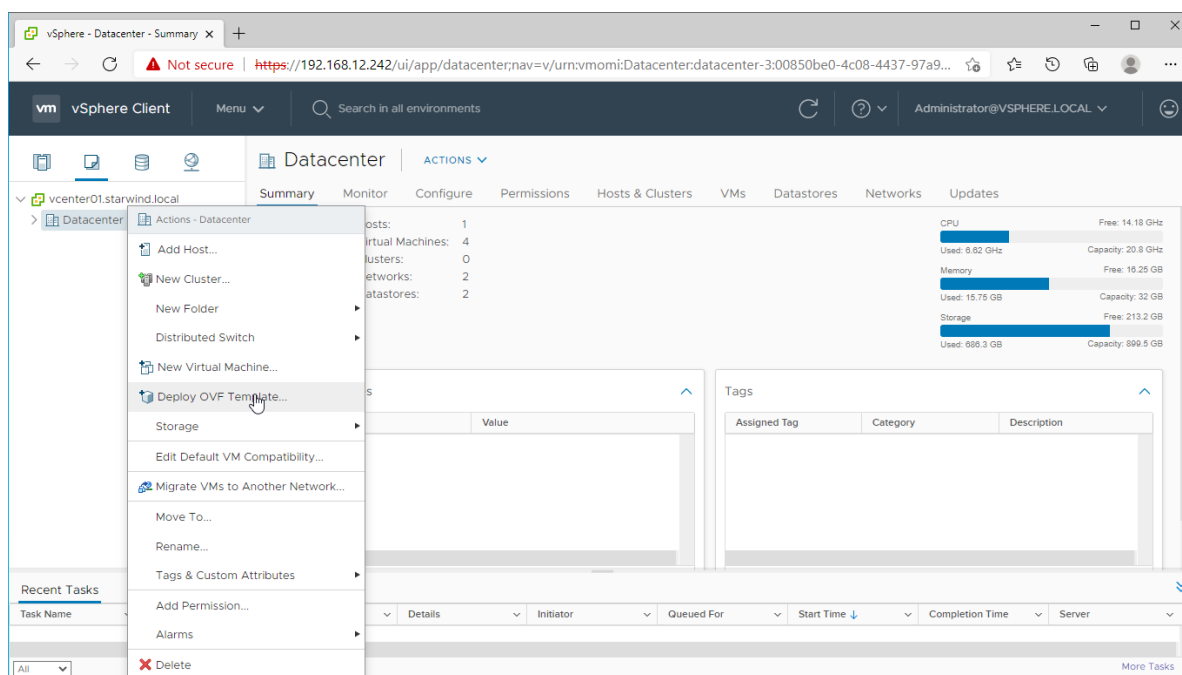


4. Repeat steps 1-3 for any other links intended for Synchronization and iSCSI/Heartbeat

traffic on ESXi hosts.

Deploying Starwind Virtual San For Vsphere

1. Download zip archive that contains StarWind Virtual SAN for vSphere:
<https://www.starwindsoftware.com/starwind-virtual-san#download>
2. Extract the virtual machine files.
3. Deploy the control virtual machine to the VMware vSphere. Right-click on the Datacenter, cluster, or node menu and select the “Deploy OVF Template...” option from a drop-down menu.



4. In the first step of the wizard, point to the location of the OVF template. Select the VM files and click Next.

Deploy OVF Template

- 1 Select an OVF template
- 2 Select a name and folder
- 3 Select a compute resource
- 4 Review details
- 5 Select storage
- 6 Ready to complete

Select an OVF template

Select an OVF template from remote URL or local file system

Enter a URL to download and install the OVF package from the Internet, or browse to a location accessible from your computer, such as a local hard drive, a network share, or a CD/DVD drive.

☐ URL

☒ Local file

4 files

5. Specify the VM name and target location.

Deploy OVF Template

- 1 Select an OVF template
- 2 Select a name and folder
- 3 Select a compute resource
- 4 Review details
- 5 Select storage
- 6 Ready to complete

Select a name and folder

Specify a unique name and target location

Virtual machine name:

Select a location for the virtual machine.

cluster01.prod.local

HQ DC

6. Select a compute resource intended to run the StarWind vSAN CVM

Deploy OVF Template

- Select an OVF template
- Select a name and folder
- Select a compute resource**
- Review details
- Select storage
- Ready to complete

Select a compute resource

Select the destination compute resource for this operation

HQ DC

Production Cluster

Compatibility

✓ Compatibility checks succeeded.

CANCEL

BACK

NEXT

7. Review the template details. Click Next.

Deploy OVF Template

- Select an OVF template
- Select a name and folder
- Select a compute resource
- Review details**
- Select storage
- Select networks
- Customize template
- Ready to complete

Review details

Verify the template details.

⚠ The OVF package contains advanced configuration options, which might pose a security risk. Review the advanced configuration options below. Click next to accept the advanced configuration options.

Publisher	No certificate present
Product	StarWind Appliance
Vendor	StarWind Software Inc.
Download size	Unknown
Size on disk	Unknown (thin provisioned) 30.0 GB (thick provisioned)
Extra configuration	disk.EnableUUID = true nvram = ovf:/file/file2

CANCEL

BACK

NEXT

8. In the second step of the wizard, specify the virtual machine provisioning type, VM Storage Policy, and select the direct-attached storage for the appliance system drive. Click Next.

Deploy OVF Template

- Select an OVF template
- Select a name and folder
- Select a compute resource
- Review details
- Select storage**
- Select networks
- Customize template
- Ready to complete

Select storage

Select the storage for the configuration and disk files

Select virtual disk format: Thick Provision Lazy Zeroed

VM Storage Policy:

☐ Disable Storage DRS for this virtual machine

Name	Storage Compatibility	Capacity	Provisioned	Free	Type	Cluster
Datastore	--	10 TB	3.38 TB	6.61 TB		

4 items

Compatibility

✓ Compatibility checks succeeded.

CANCEL BACK NEXT

9. Select the destination network for each network adapter assigned to the VM.

The default naming for virtual switches:

- the Management virtual switch is "Management vSwitch",
- the iSCSI virtual switch is "Data/iSCSI vSwitch",
- the Synchronization virtual switch is "Replication/Sync vSwitch".

Specify corresponding network connections according to your virtual network naming. Click Next.

Deploy OVF Template

- Select an OVF template
- Select a name and folder
- Select a compute resource
- Review details
- Select storage
- Select networks**
- Customize template
- Ready to complete

Select networks

Select a destination network for each source network.

Source Network	Destination Network
Management Network	Management
Data Network	Data network
Replication Network	Replica network

3 items

IP Allocation Settings

IP allocation: Static - Manual

IP protocol: IPv4

CANCEL BACK NEXT

10. Specify the hostname, static IPv4 address, gateway, DNS, and additional network

settings for Management and iSCSI/Data network interfaces:

Deploy OVF Template

- Select an OVF template
- Select a name and folder
- Select a compute resource
- Review details
- Select storage
- Select networks
- Customize template**
- Ready to complete

Customize template

Customize the deployment properties of this software solution.

✓ All properties have valid values

Management interface network settings		5 settings
Hostname	Hostname of StarWind Appliance SW1	
IPv4 address for Management interface	IPv4 address for Management interface (example 192.168.1.100) 192.168.12.206	
IPv4 netmask for Management interface	IPv4 netmask for Management interface (example 24) 23	
IPv4 gateway for Management interface	IPv4 gateway for Management interface (example 192.168.1.1) 192.168.12.1	
DNS Server for Management interface	DNS Server for Data interface (example 8.8.8.8) 192.168.12.17	

CANCEL BACK NEXT

NOTE: To manage the StarWind appliances via the StarWind vCenter plugin, the static IPv4 address must be assigned.

Deploy OVF Template

- Select an OVF template
- Select a name and folder
- Select a compute resource
- Review details
- Select storage
- Select networks
- Customize template**
- Ready to complete

Customize template

192.168.12.1

DNS Server for Management interface	DNS Server for Data interface (example 8.8.8.8) 192.168.12.17	
Data Interface network settings		3 settings
IPv4 address for Data interface	IPv4 address for Data interface (example 172.16.10.10) 172.16.10.100	
IPv4 netmask for Data interface	IPv4 netmask for Data interface (example 24) 24	
MTU for Data interface	MTU for Data interface (example 9000) 9000	
Enable additional services		1 settings
Enable SSH	SSH is disabled by default. Select the checkbox to enable it <input checked="" type="checkbox"/>	

CANCEL BACK NEXT

NOTE: if a DHCP server is available on the given network, you can skip setting the additional parameters for that interface.

11. Review the deployment summary information and click to start the VM creation.

Deploy OVF Template

- Select an OVF template
- Select a name and folder
- Select a compute resource
- Review details
- Select storage
- Select networks
- Customize template
- Ready to complete

Ready to complete

Select networks

Network mapping	3
Management Network	Management
Data Network	Data network
Replication Network	Replica network

IP allocation settings

IP protocol	IPv4
IP allocation	Static - Manual

Customize template

Properties

```

Hostname = SW1
IPv4 address for Management interface = 192.168.12.206
IPv4 netmask for Management interface = 23
IPv4 gateway for Management interface = 192.168.12.1
DNS Server for Management interface = 192.168.12.17
IPv4 address for Data interface = 172.16.10.100
IPv4 netmask for Data interface = 24
MTU for Data interface = 9000
Enable SSH = True

```

CANCEL

BACK

FINISH

12. Repeat the VM deployment on each other ESXi hosts.

NOTE: In some cases, it's recommended to reserve memory for StarWind VSAN VM.

NOTE: When using StarWind with the synchronous replication feature inside of a Virtual Machine, it is recommended not to make backups and/or snapshots of the Virtual Machine with the StarWind VSAN service installed, as this could pause the StarWind Virtual Machine. Pausing the Virtual Machines while the StarWind VSAN service is under load may lead to split-brain issues in synchronous replication devices, thus to data corruption.

Initial Configuration Wizard

1. Start StarWind Virtual SAN CVM.

2. Launch VM console to see the VM boot process and get the IPv4 address of the Management network interface.

NOTE: in case VM has no IPv4 address obtained from a DHCP server, use the Text-based User Interface (TUI) to set up a Management network.

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



Your connection is not private

Attackers might be trying to steal your information from **192.168.12.206** (for example, passwords, messages, or credit cards). [Learn more](#)

NET:ERR_CERT_AUTHORITY_INVALID

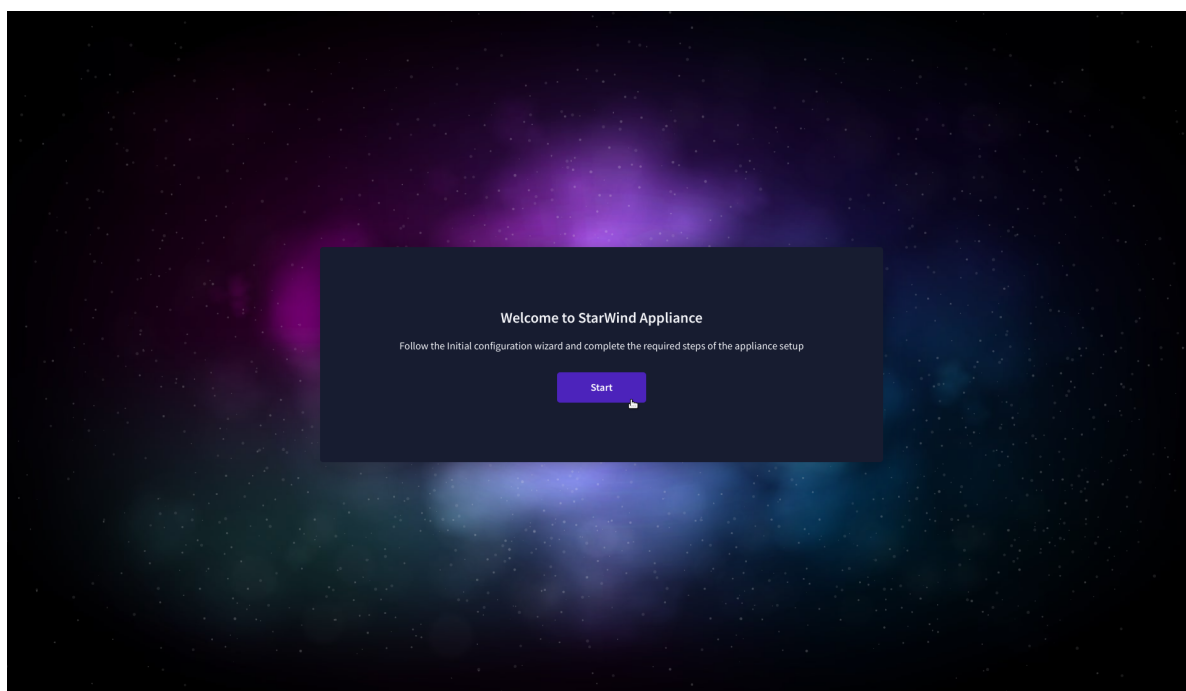
Hide advanced

Back to safety

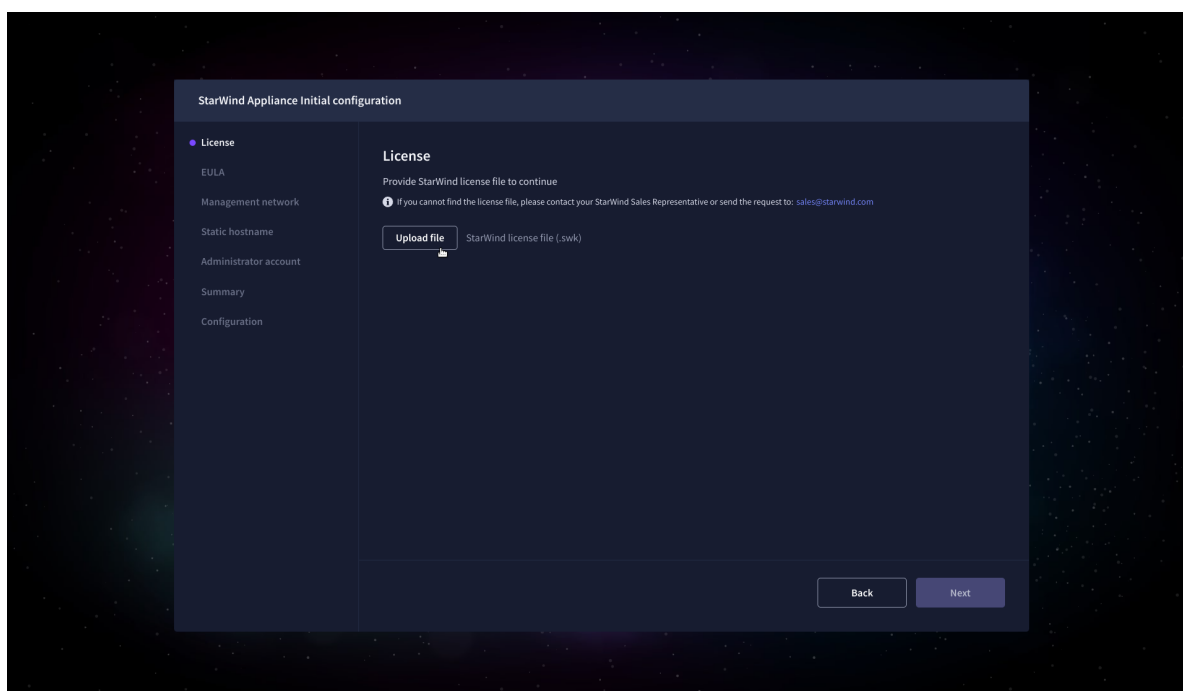
This server could not prove that it is **192.168.12.206**; its security certificate is not trusted by your computer's operating system. This may be caused by a misconfiguration or an attacker intercepting your connection.

[Proceed to 192.168.12.206 \(unsafe\)](#)

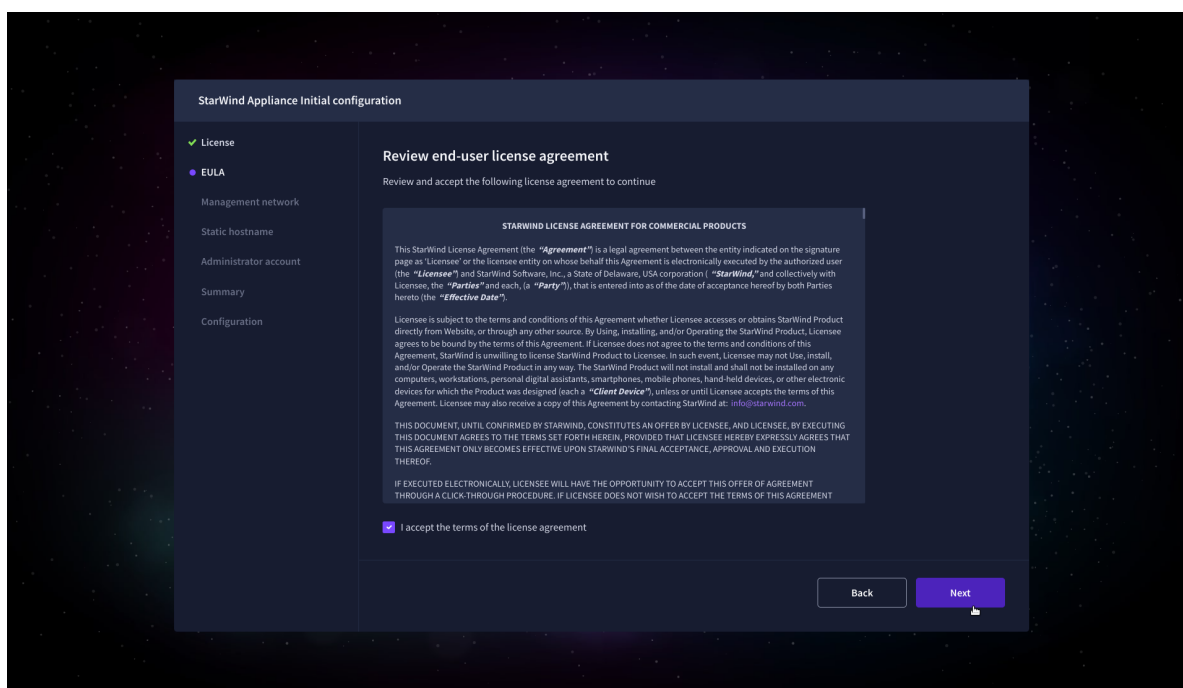
4. StarWind VSAN web UI welcomes you, and the “Initial Configuration” wizard will guide you through the deployment process.



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

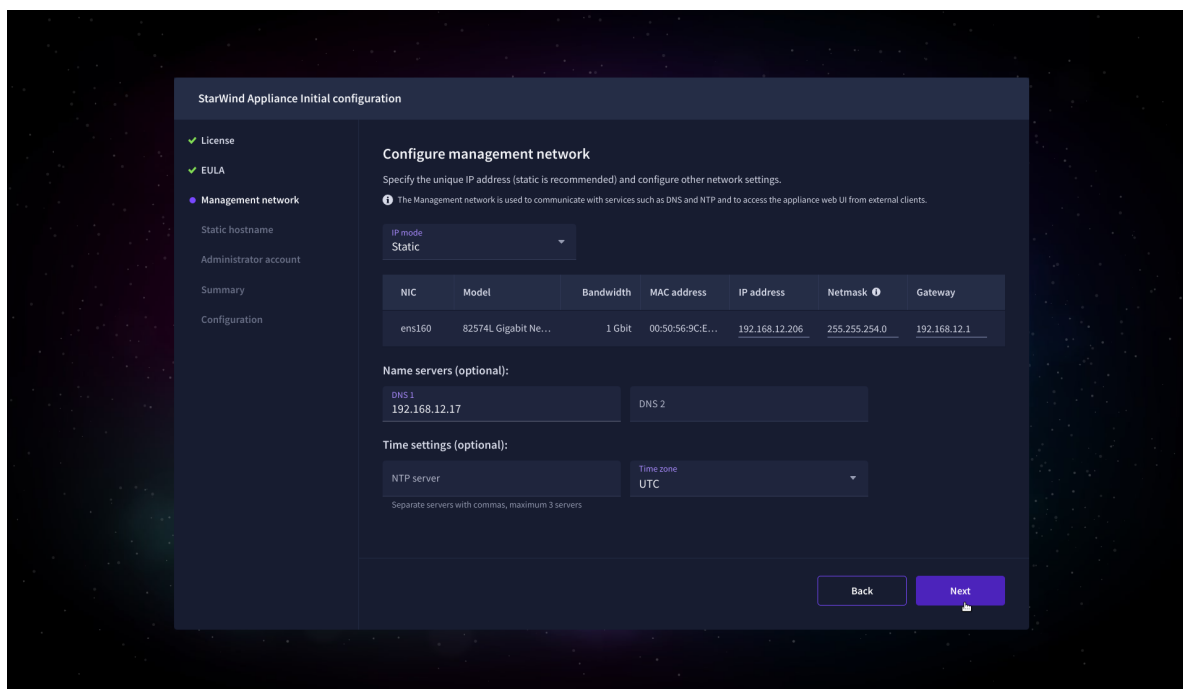


6. Read and accept the End User License Agreement to proceed.



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

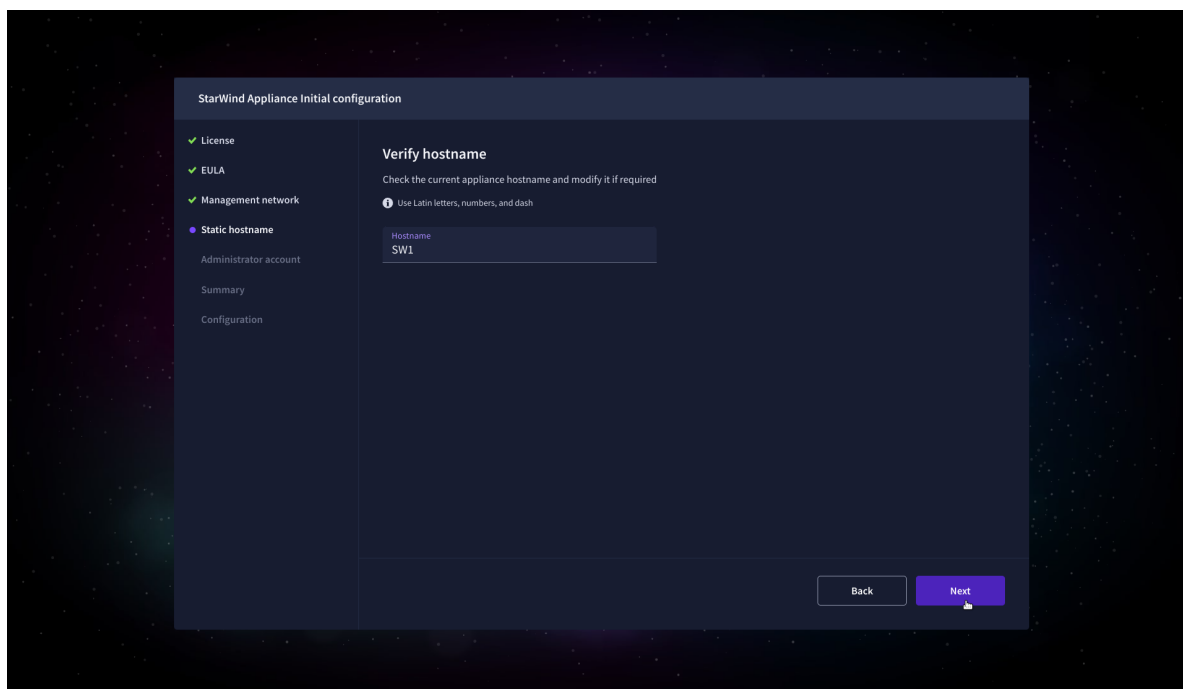
NOTE: Static network settings are recommended for the configuration.



The screenshot shows the 'StarWind Appliance Initial configuration' window. On the left sidebar, the 'Management network' step is selected. The main area is titled 'Configure management network' and includes instructions to specify a unique IP address. A table lists network details for the 'ens160' interface. Below the table, there are optional fields for DNS servers and NTP settings. 'Back' and 'Next' buttons are at the bottom right.

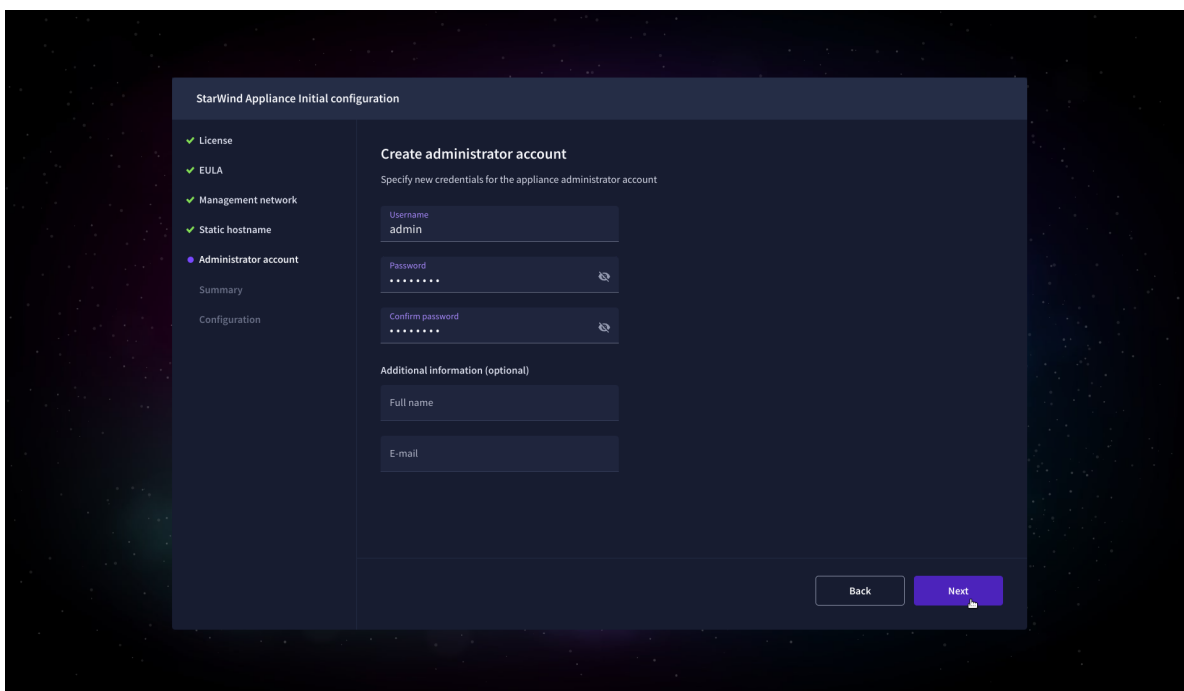
NIC	Model	Bandwidth	MAC address	IP address	Netmask	Gateway
ens160	82574L Gigabit Ne...	1 Gbit	00:50:56:9C:E...	192.168.12.206	255.255.254.0	192.168.12.1

8. Specify the hostname for the virtual machine and click Next.



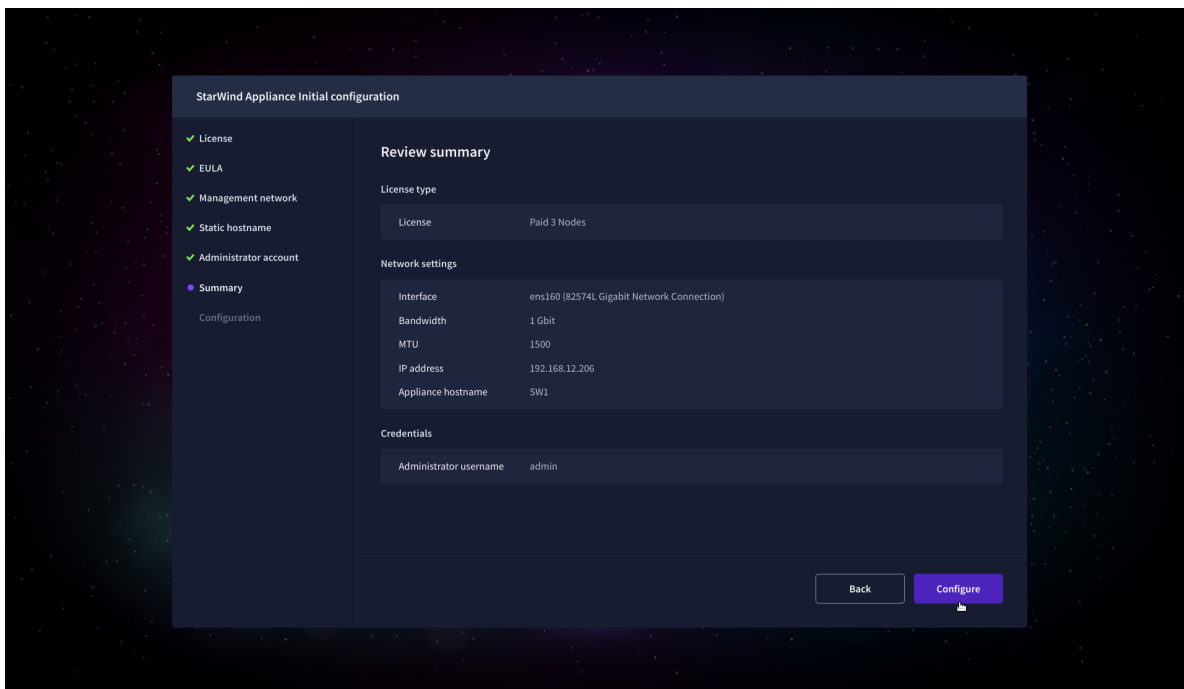
The screenshot shows the 'StarWind Appliance Initial configuration' window. On the left sidebar, the 'Static hostname' step is selected. The main area is titled 'Verify hostname' and includes instructions to check the current appliance hostname. A text field shows the hostname 'SW1'. 'Back' and 'Next' buttons are at the bottom right.

9. Create an administrator account. Click Next.



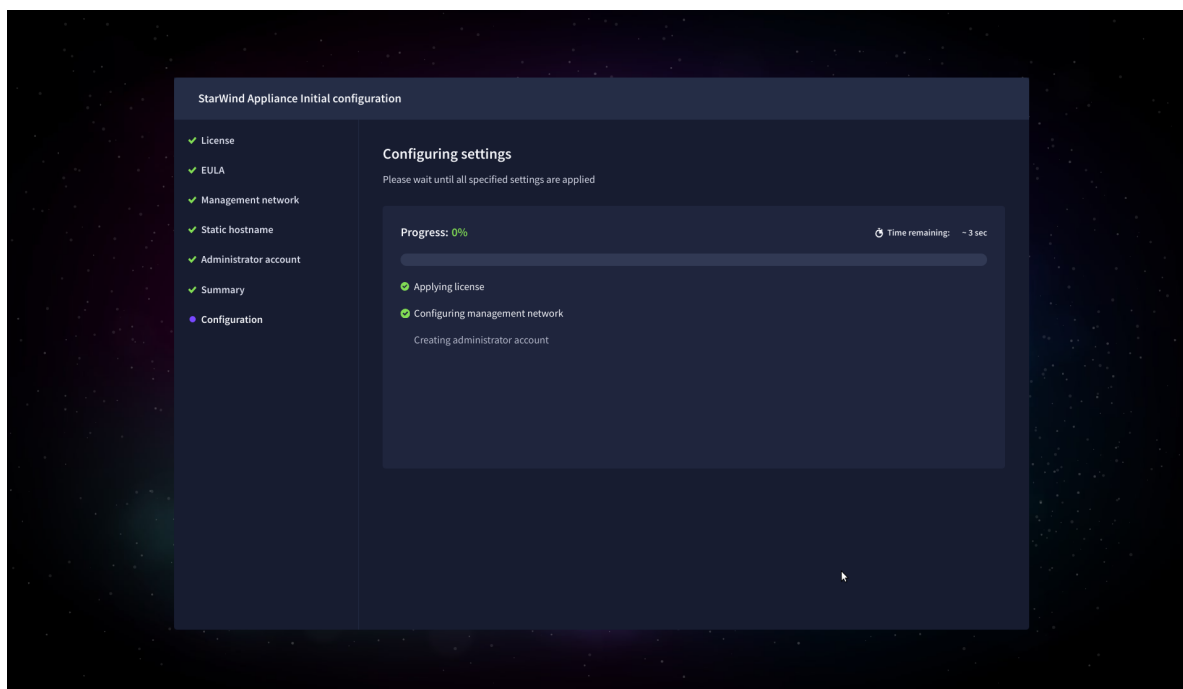
The screenshot shows the 'StarWind Appliance Initial configuration' window. On the left sidebar, the steps are: License (checked), EULA (checked), Management network (checked), Static hostname (checked), Administrator account (selected), Summary, and Configuration. The main area is titled 'Create administrator account' with the instruction 'Specify new credentials for the appliance administrator account'. It contains three input fields: 'Username' with the value 'admin', 'Password' (masked with dots), and 'Confirm password' (masked with dots). Below these are optional fields for 'Full name' and 'E-mail'. At the bottom right are 'Back' and 'Next' buttons.

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

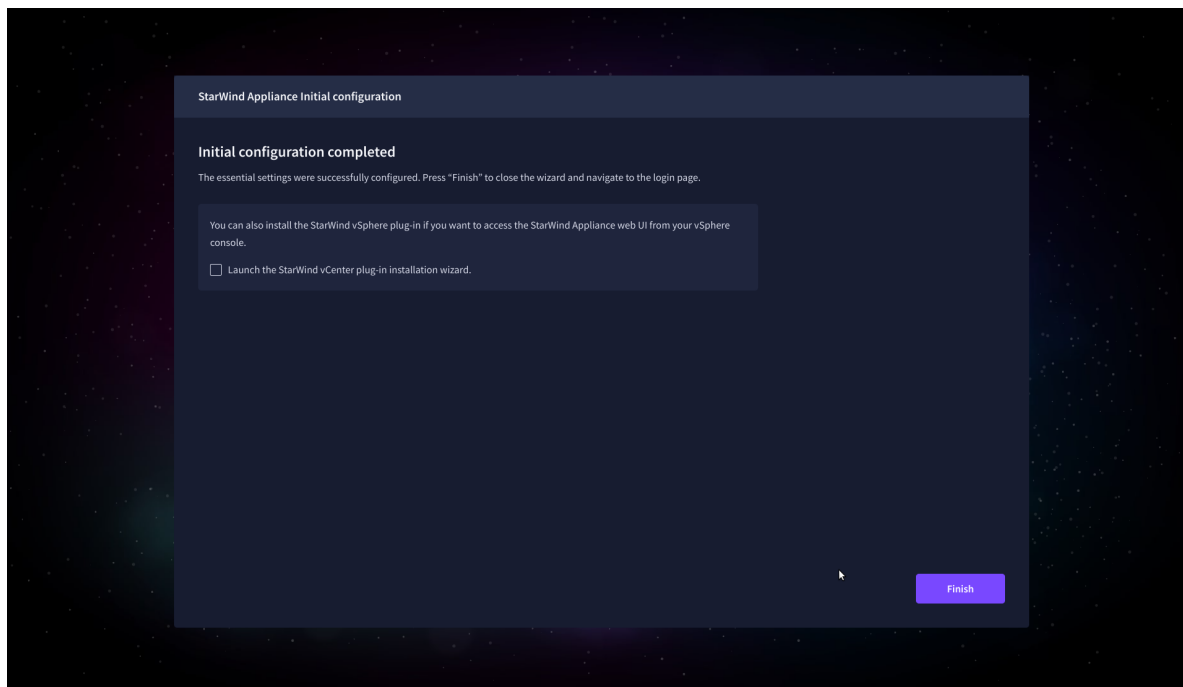


The screenshot shows the 'StarWind Appliance Initial configuration' window at the 'Review summary' step. The left sidebar now has 'Summary' selected. The main area is titled 'Review summary' and contains three sections: 'License type' showing 'License' and 'Paid 3 Nodes'; 'Network settings' showing 'Interface' as 'ens160 (82574L Gigabit Network Connection)', 'Bandwidth' as '1 Gbit', 'MTU' as '1500', 'IP address' as '192.168.12.206', and 'Appliance hostname' as 'SW1'; and 'Credentials' showing 'Administrator username' as 'admin'. At the bottom right are 'Back' and 'Configure' buttons.

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



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



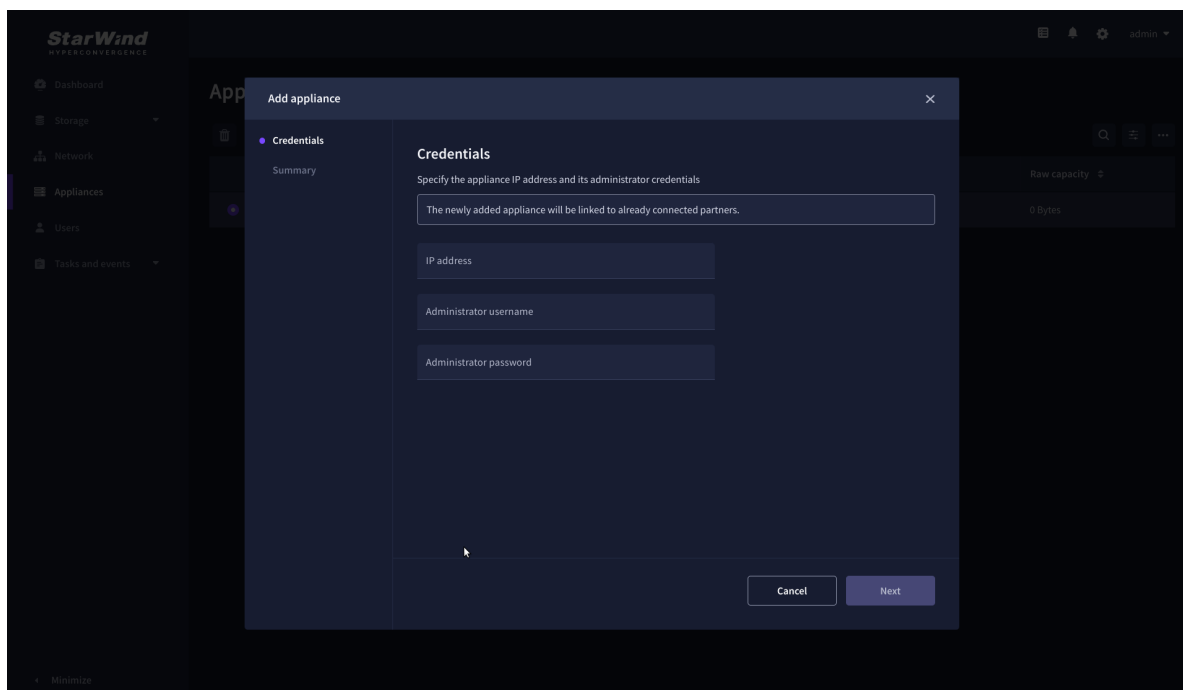
13. Repeat the initial configuration on other StarWind CVMs that will be used to create 2-node or 3-node HA shared storage.

Add Appliance

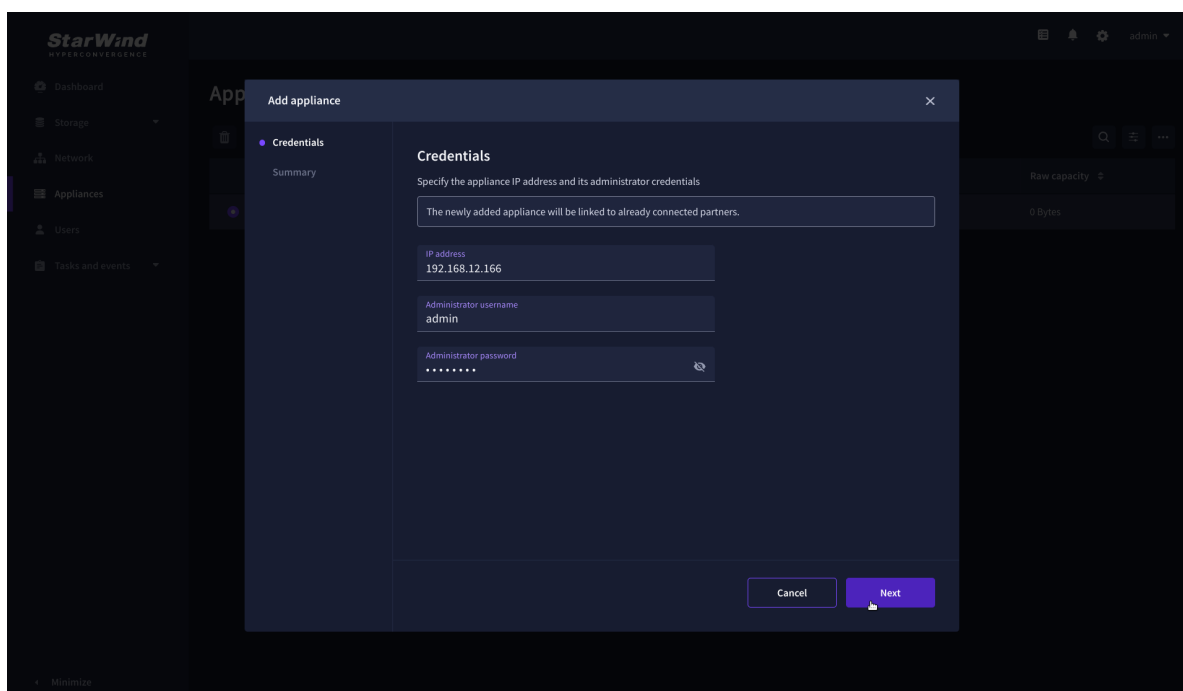
To create 2-way or 3-way synchronously replicated highly available storage, add partner appliances that use the same license key.

1. Add StarWind appliance(s) in the web console, on the Appliances page.

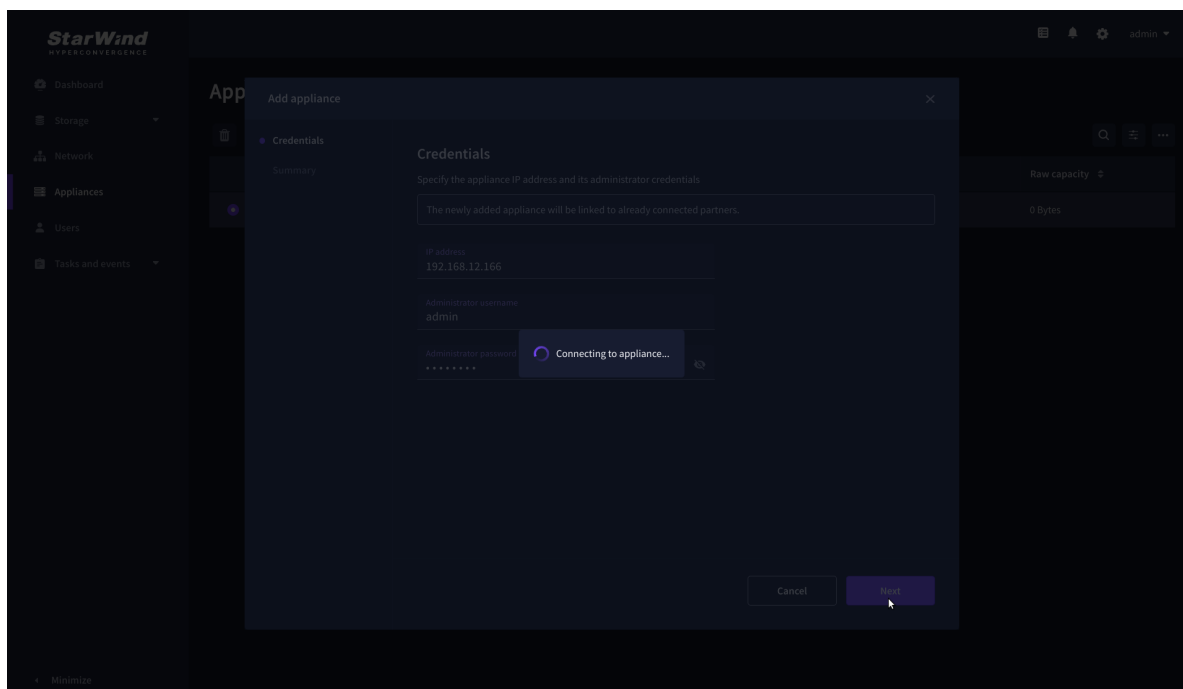
NOTE: The newly added appliance will be linked to already connected partners.



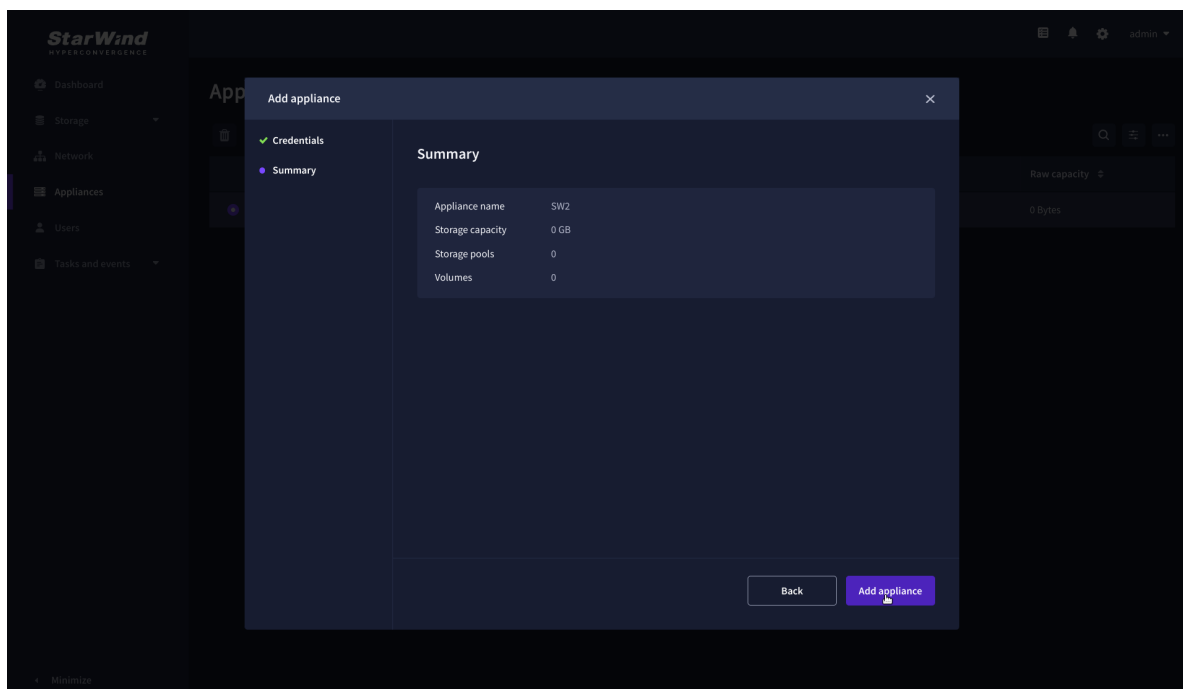
2. Provide credentials of partner appliance.



3. Wait for connection and validation of settings.

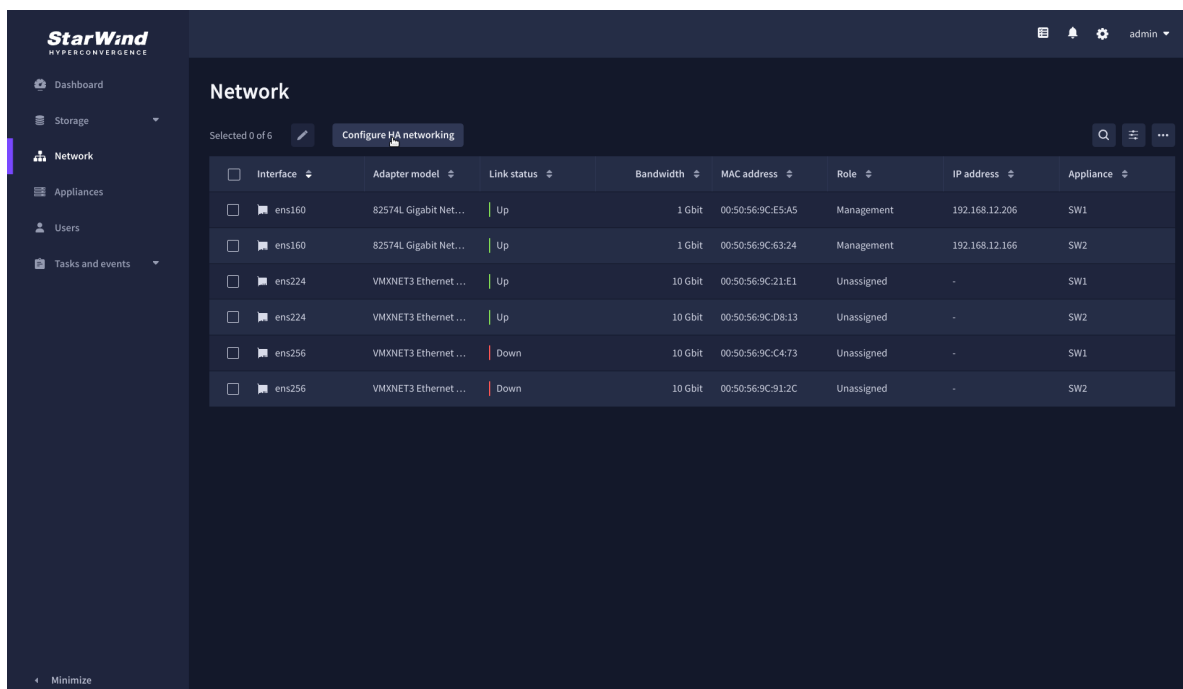


4. Review the summary and click “Add appliance”.



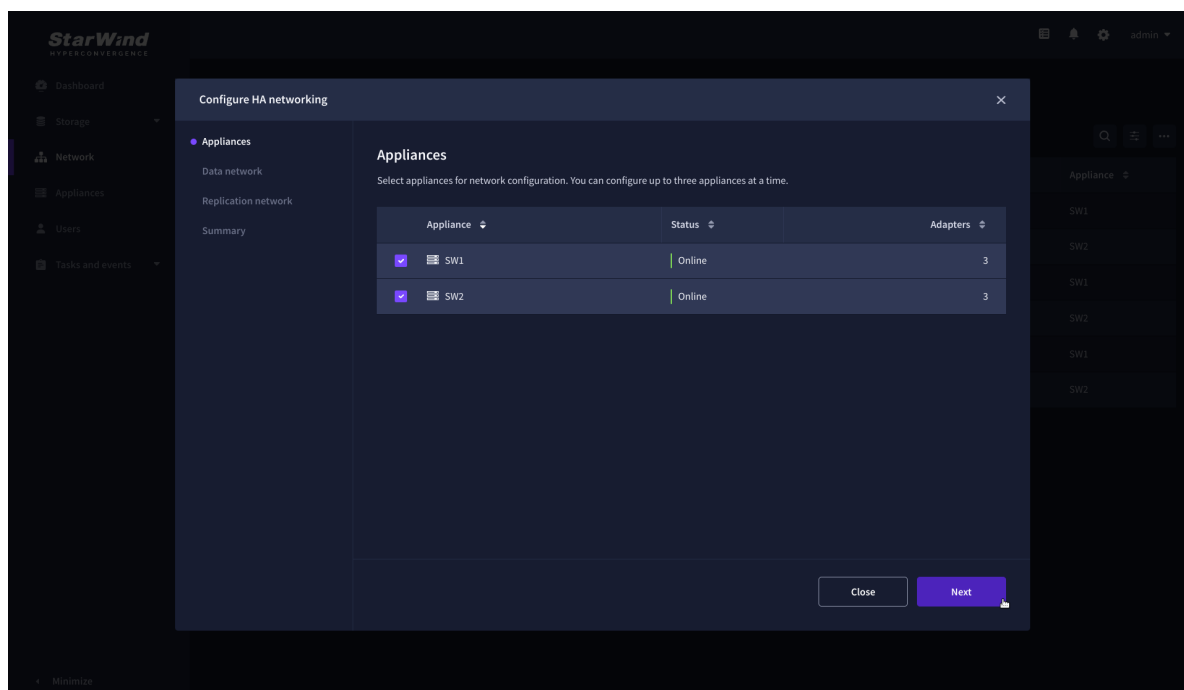
Configure Ha Networking

1. Launch the “Configure HA Networking” wizard.



2. Select appliances for network configuration.

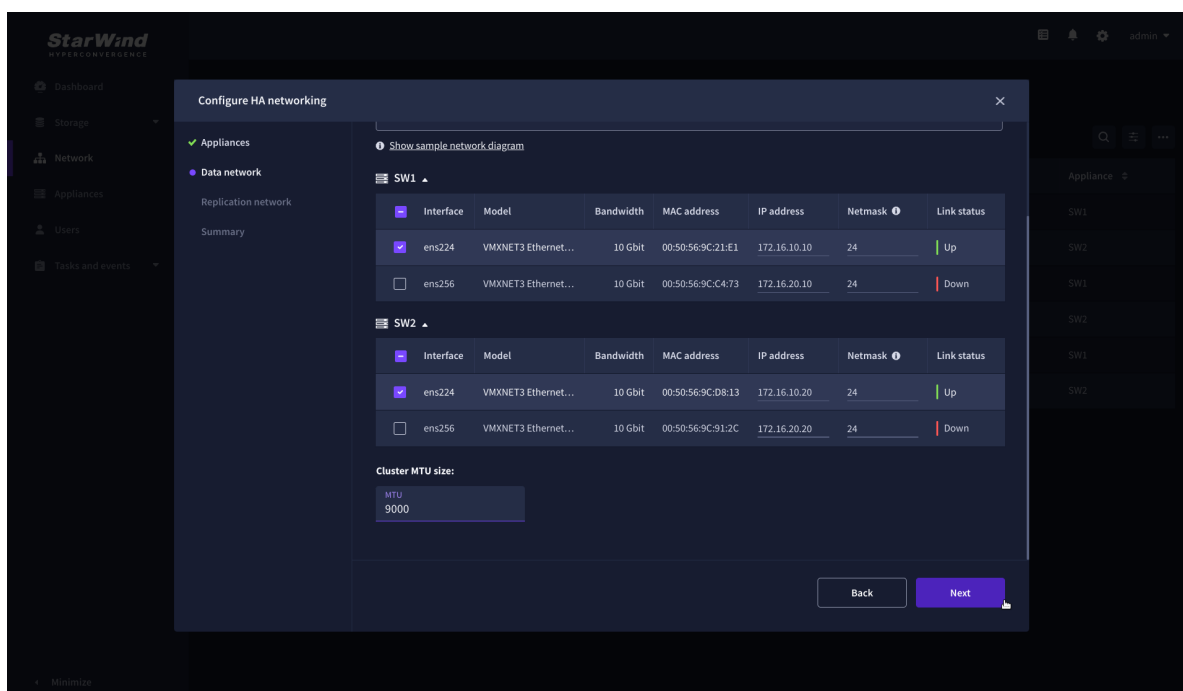
NOTE: the number of appliances to select is limited by your license, so can be either two or three appliances at a time.



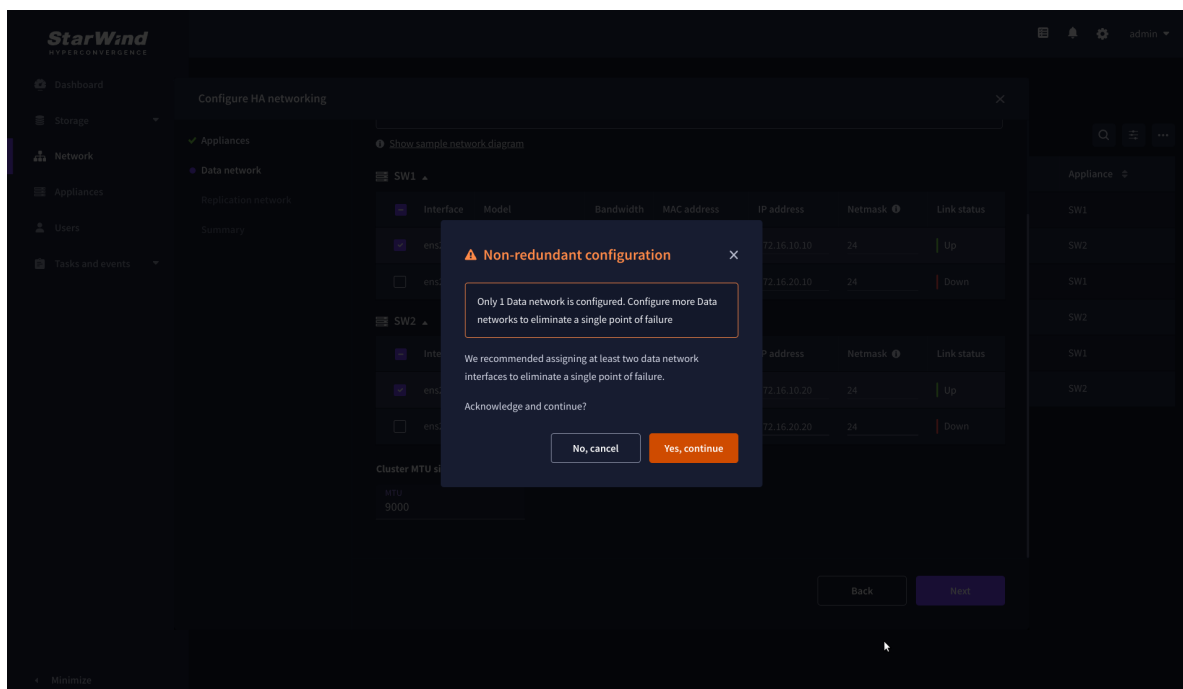
3. Configure the “Data” network. Select interfaces to carry storage traffic, configure them with static IP addresses in unique networks, and specify subnet masks:

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

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



5. Click Next to validate Data network settings.

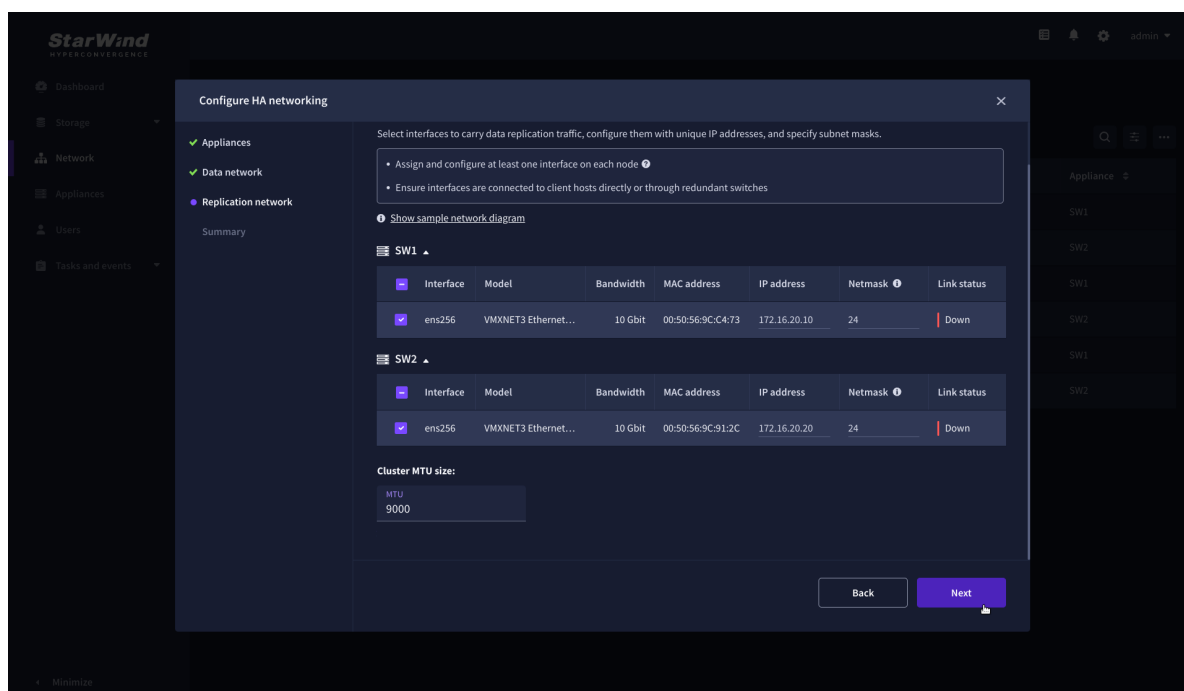


6. Configure the “Replication” network. Select interfaces to carry storage traffic, configure them with static IP addresses in unique networks, and specify subnet masks:

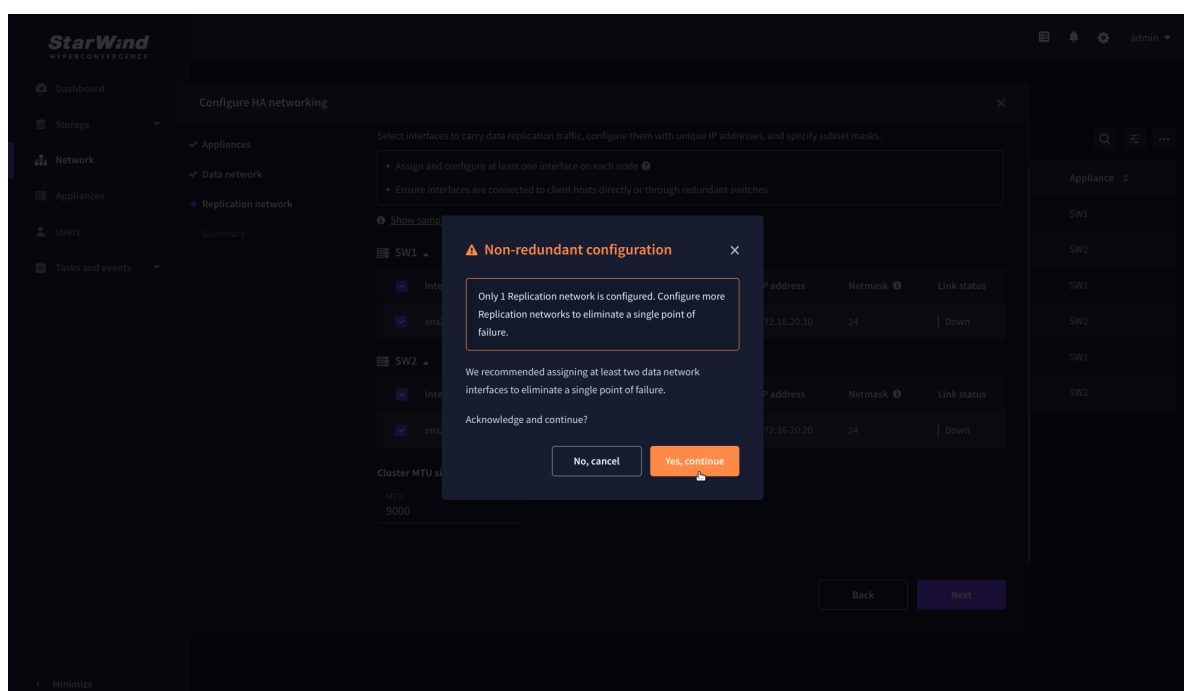
- assign and configure at least one interface on each node
- for redundant configuration, select two interfaces on each node

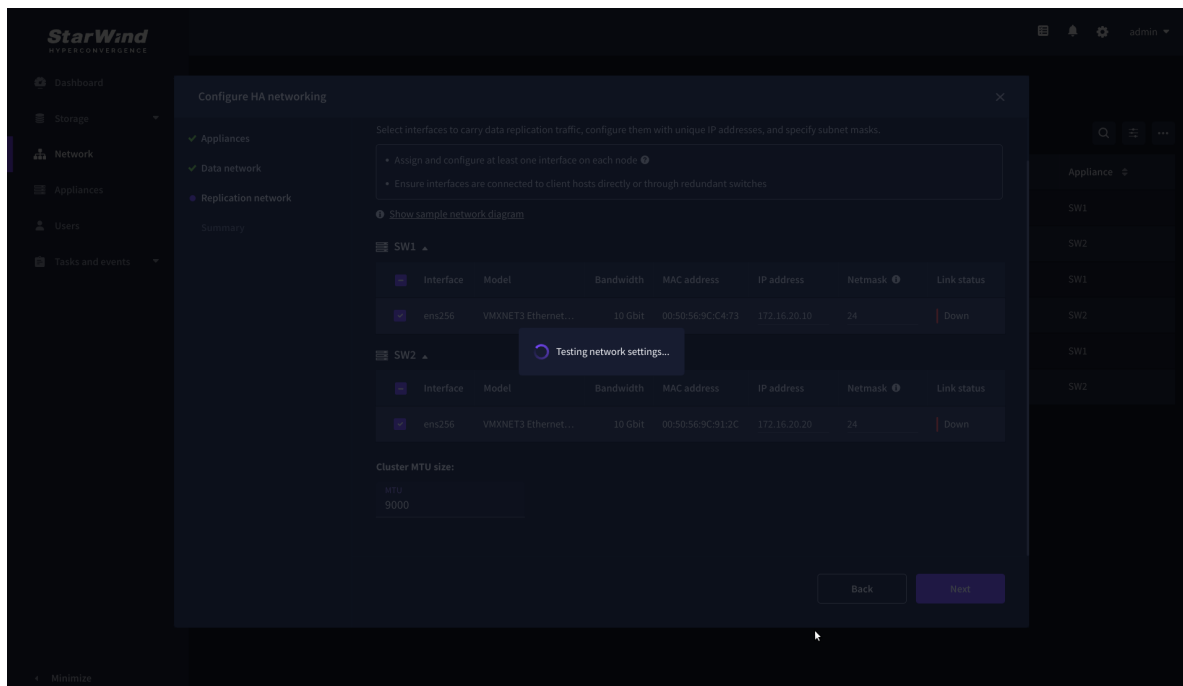
- ensure interfaces are connected to client hosts directly or through redundant switches

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

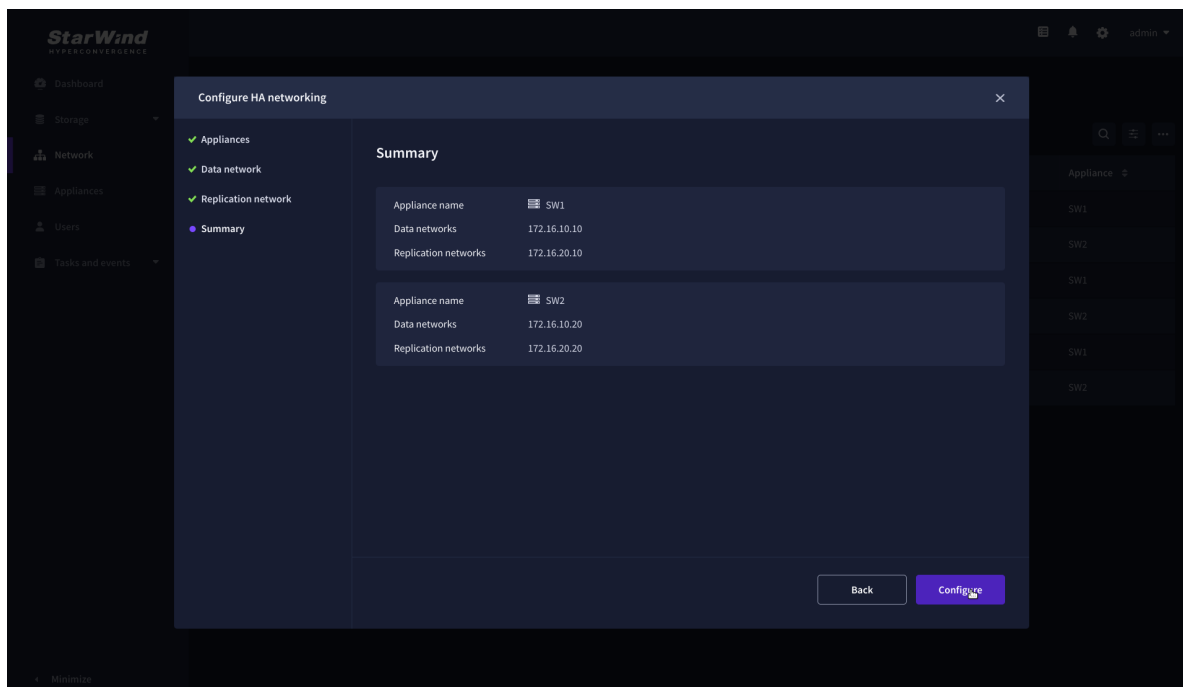


8. Click Next to validate the Replication network settings completion.





9. Review the summary and click Configure.



Add Physical Disks

Attach storage to StarWind Virtual SAN Controller VM:

- the physical hosts have all the drives connected through an HBA or RAID controller
- HBA or RAID controller will be added via a DirectPath I/O passthrough device to a StarWind CVM. Follow the instructions from the VMware on how to add a RAID controller as a PCI device to StarWind VM:
<https://docs.vmware.com/en/VMware-vSphere/8.0/vsphere-esxi-host-client/GUID-2B6D43A6-9598-47C4-A2E7-5924E3367BB6.html>
- StarWind CVM is installed on each server that is used to configure highly available storage.
- it is recommended to install StarWind CVM on a separate storage device available to the hypervisor host (e.g. SSD, HDD, etc.).
- for VMware vSphere environments, the disks can be added to StarWind VM as RDM. The link to VMware documentation is below:
https://docs.vmware.com/en/VMware-vSphere/7.0/com.vmware.vsphere.vm_admin.doc/GUID-4236E44E-E11F-4EDD-8CC0-12BA664BB811.html

NOTE: In order to make RDM and VMDK disks available for StarWind devices in StarWind CVM Version 20231016 (build 15260), please follow the steps below.

- stop service

```
sudo systemctl stop starwind-san-and-nas-console
```

- get VMDK/RDM/ device letter using lsblk command

```
lsblk |grep -v sda # sda - is excluded system drive.
```

- edit config file

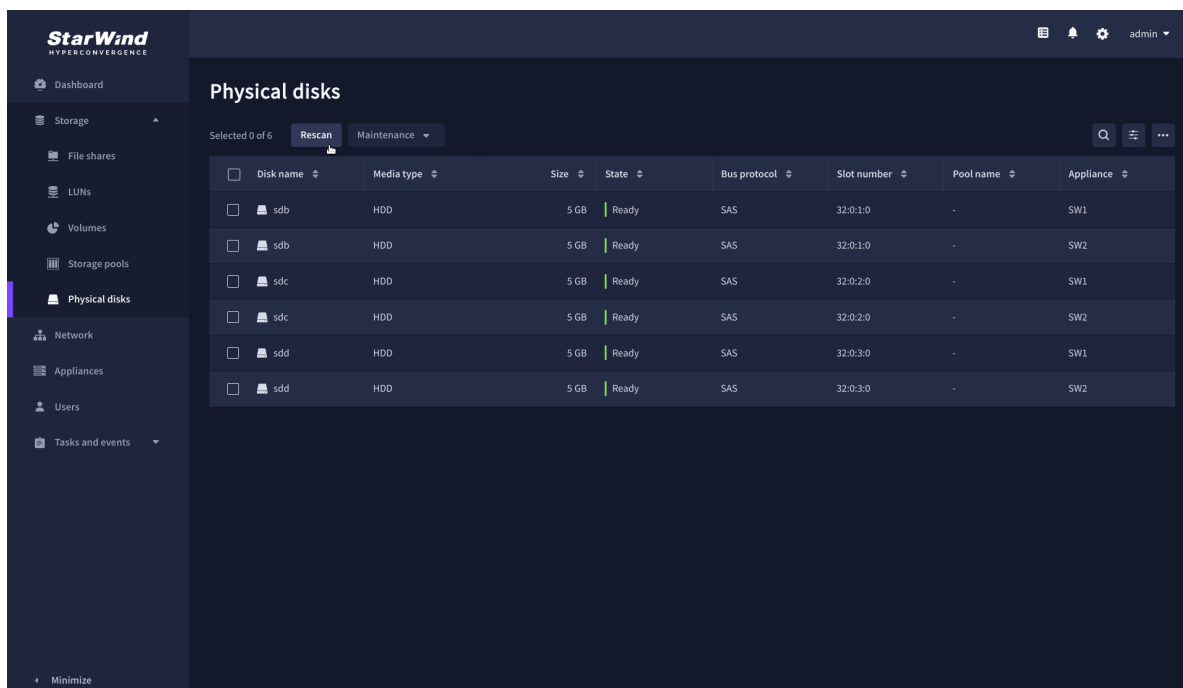
```
sudo nano /opt/starwind/starwind-san-and-nas-console/appsettings.json
```

- add lines to the file, previously setting the disk letters to config (e.g. sdb, sdc)

```
"HardwareRaidImulation": {"PhysicalDisks": [ "sdb", "sdc" ]
},
```

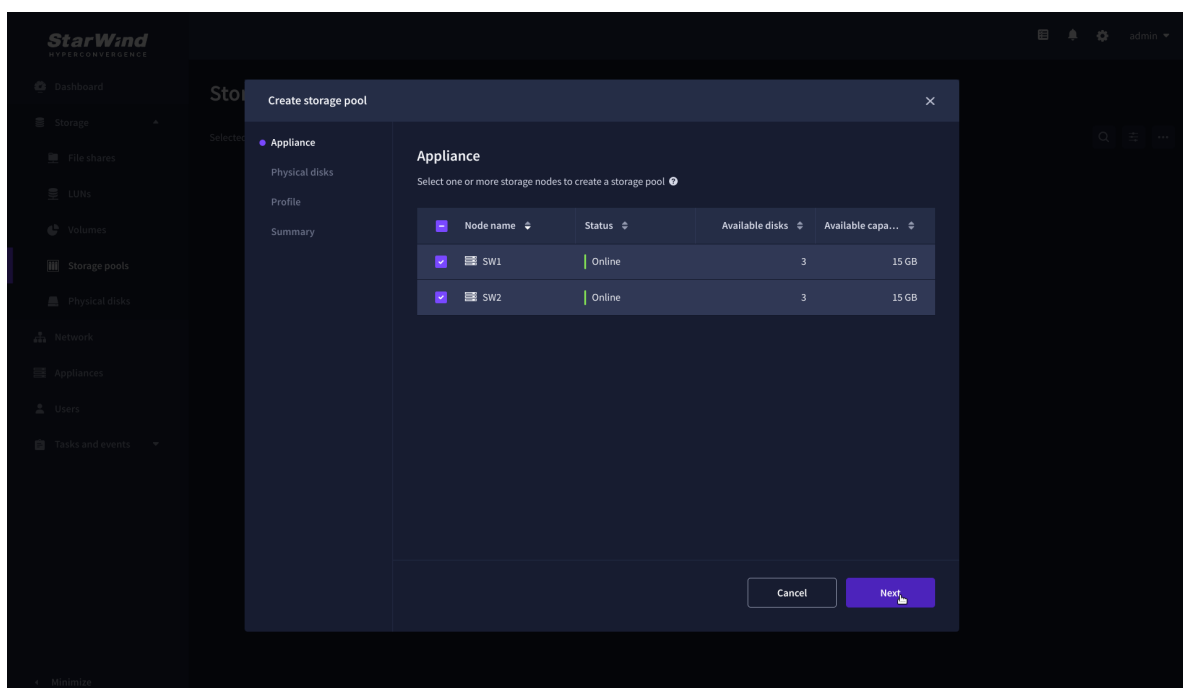
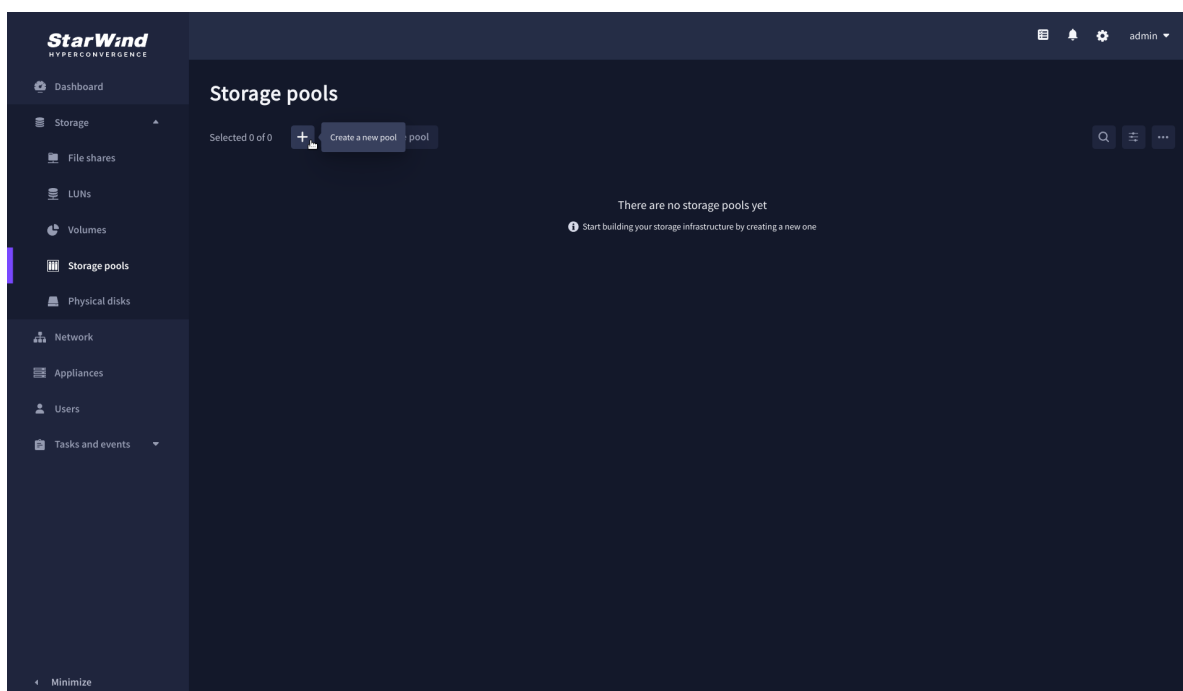
- start service

```
sudo systemctl start starwind-san-and-nas-console
```

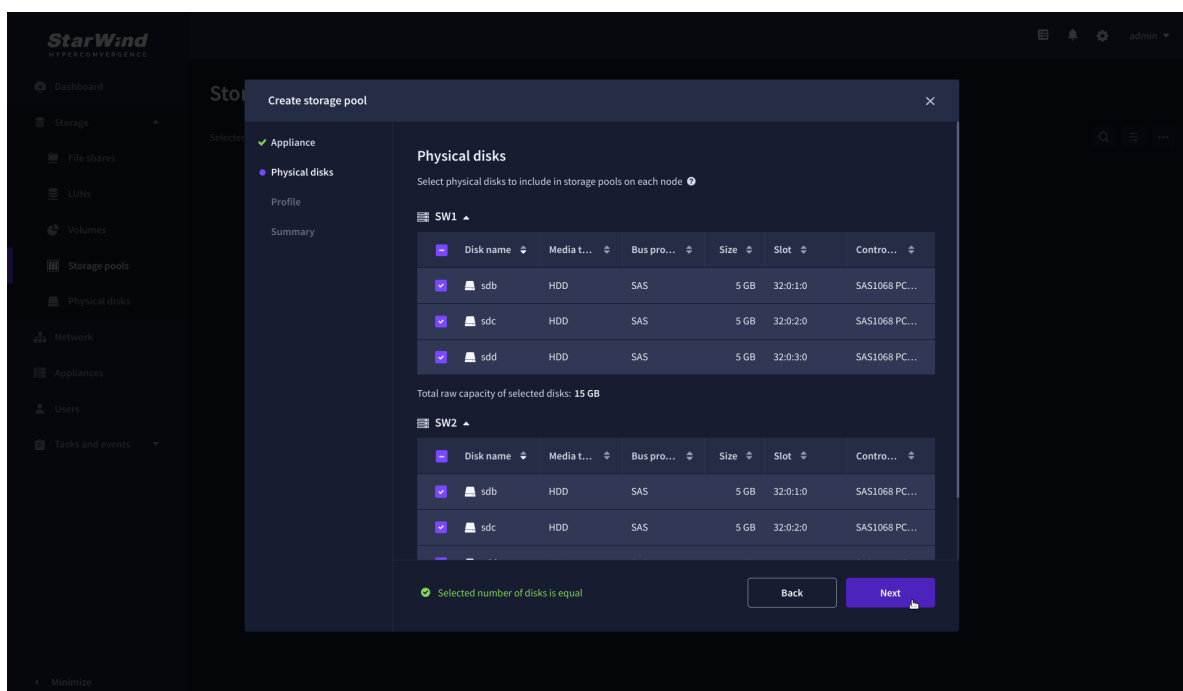


Create Storage Pool

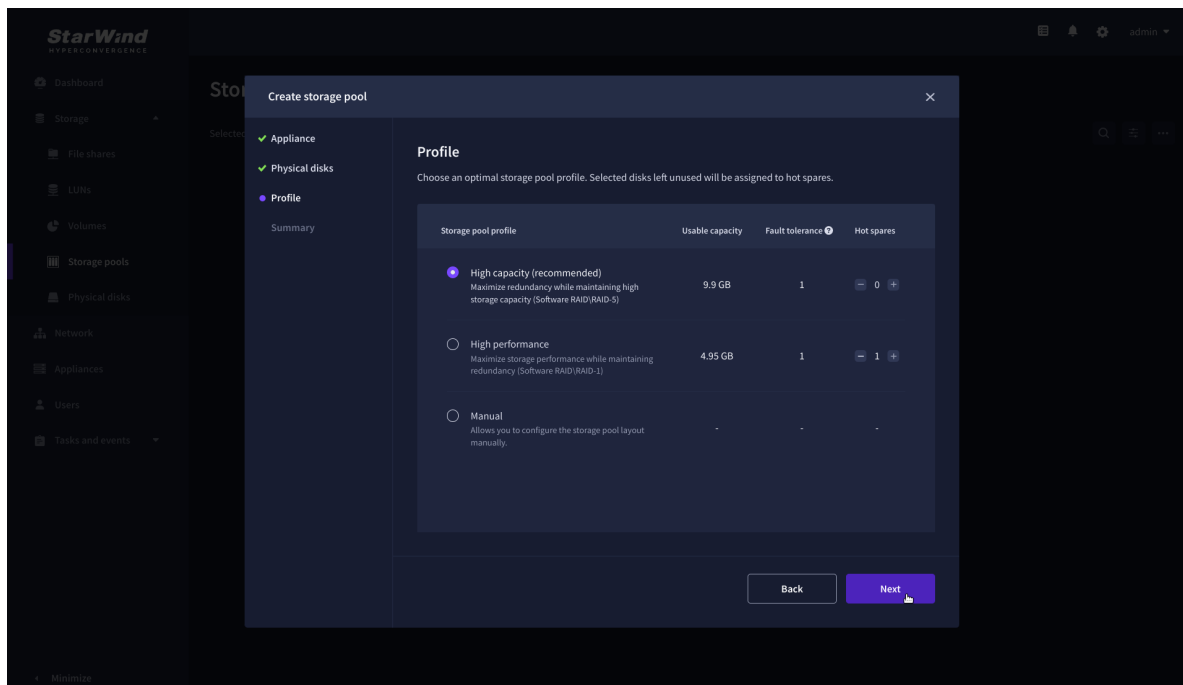
1. Click the “Add” button to create a storage pool.
2. Select two storage nodes to create a storage pool on them simultaneously.



3. Select physical disks to include in the storage pool name and click the “Next” button.
NOTE: Select identical type and number of disks on each storage node to create identical storage pools.



4. Select one of the preconfigured storage profiles or create a redundancy layout for the new storage pool manually according to your redundancy, capacity, and performance requirements.

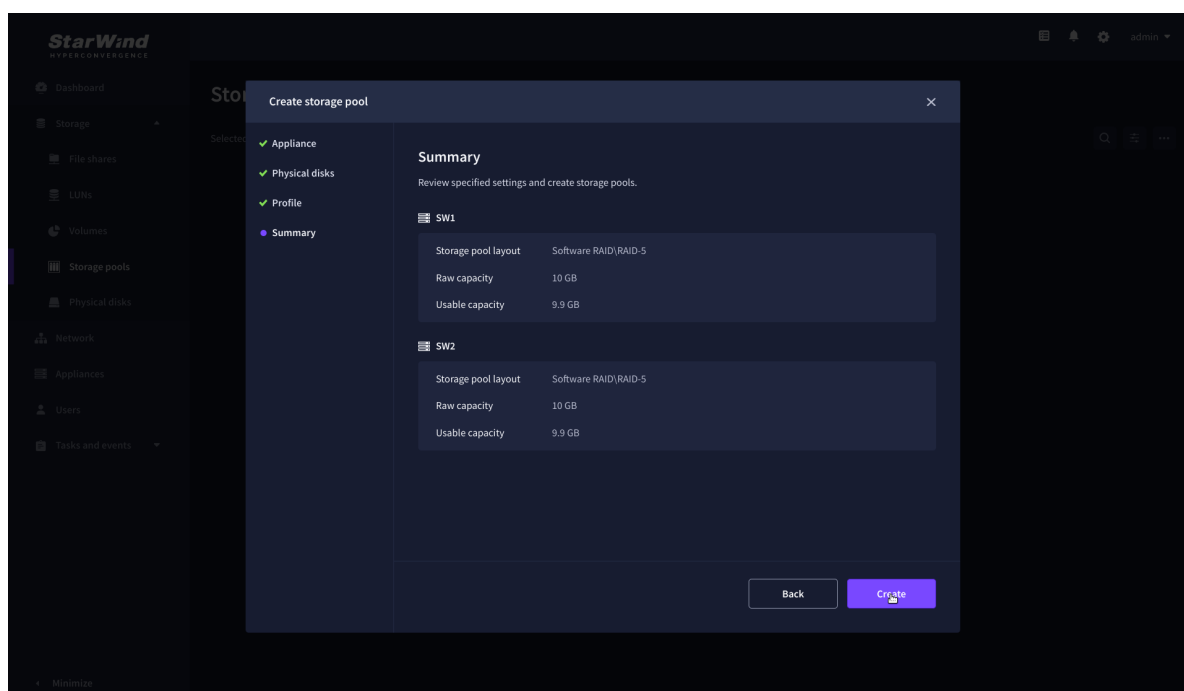


Hardware RAID, Linux Software RAID, and ZFS storage pools are supported and integrated into the StarWind CVM web interface. To make easier the storage pool configuration, the preconfigured storage profiles are provided to configure the

recommended pool type and layout according to the direct-attached storage:

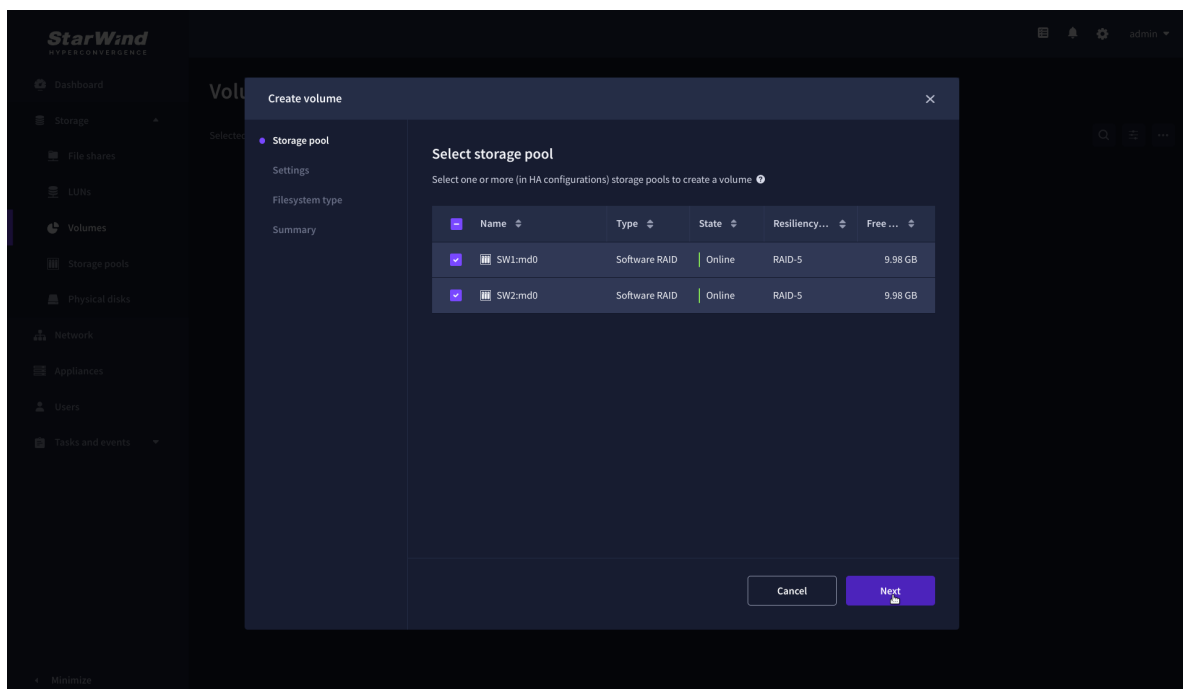
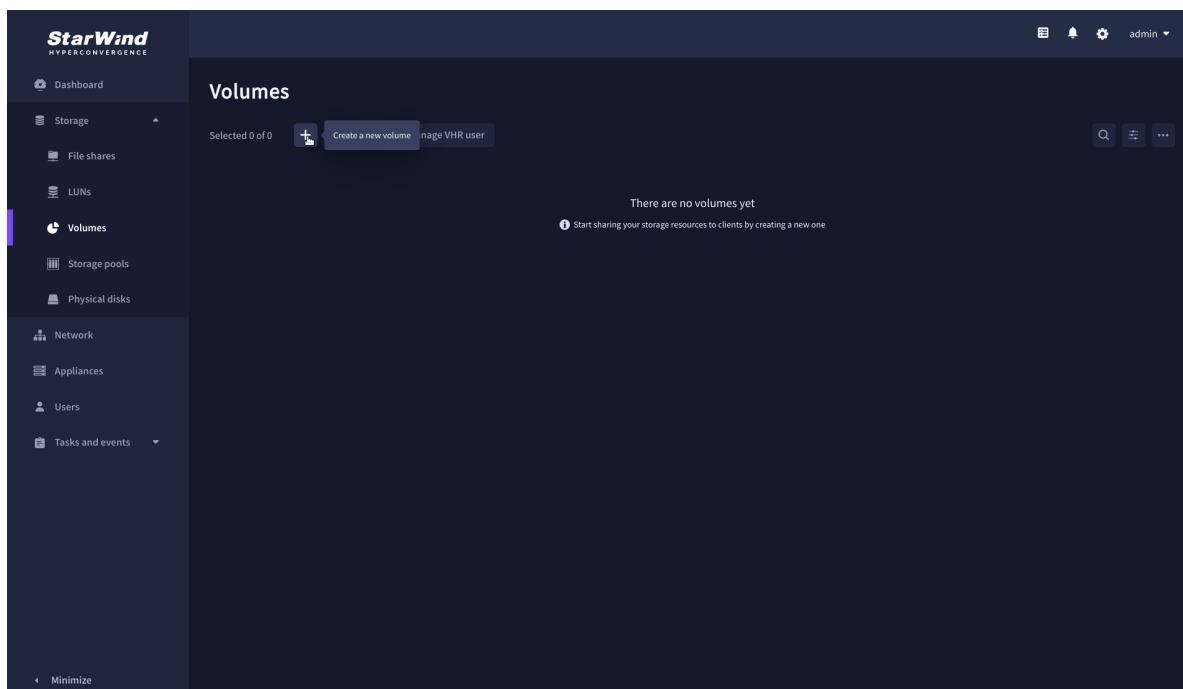
- hardware RAID – configures Hardware RAID’s virtual disk as a storage pool. It is available only if a hardware RAID controller is passed through to the CVM
- high performance – creates Linux Software RAID-10 to maximize storage performance while maintaining redundancy
- high capacity – creates Linux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

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

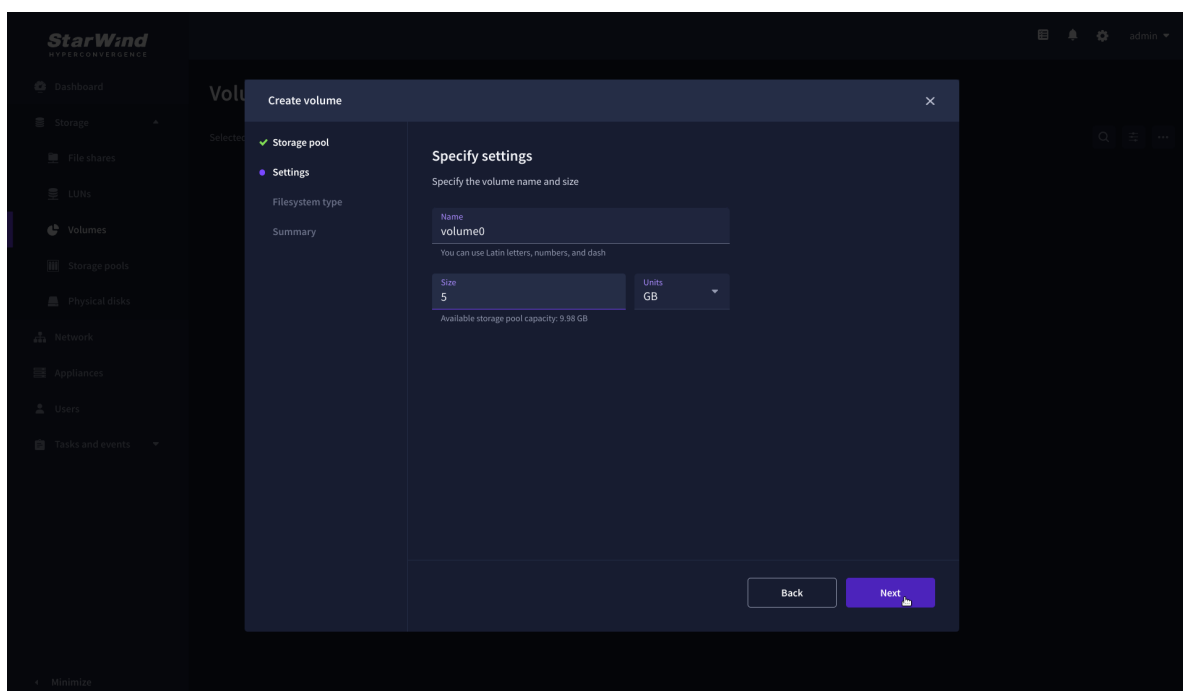


Create Volume

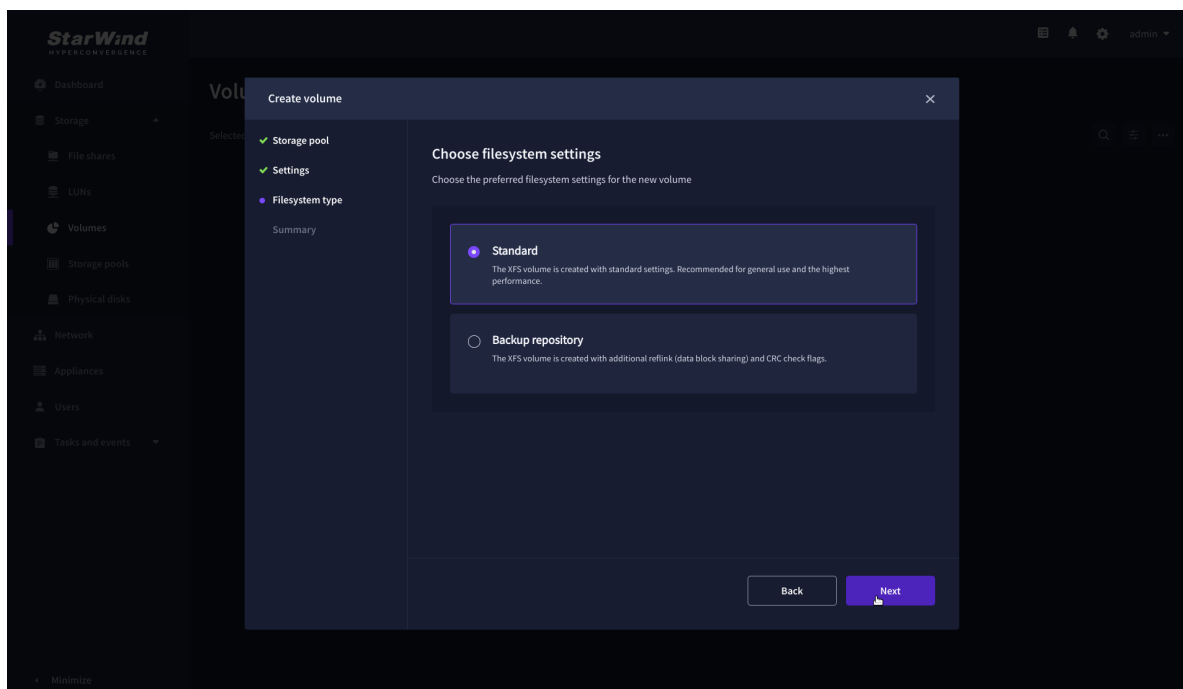
1. To create volumes, click the “Add” button.
2. Select two identical storage pools to create a volume simultaneously.



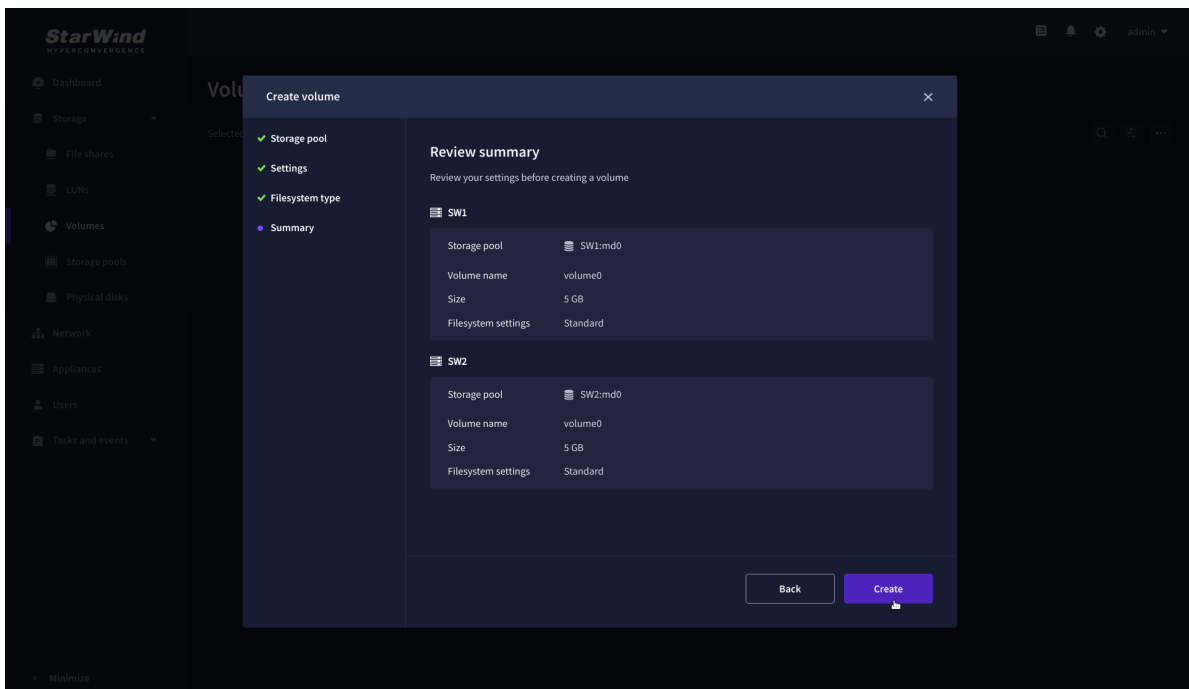
3. Specify volume name and capacity.



4. Select the Standard volume type.



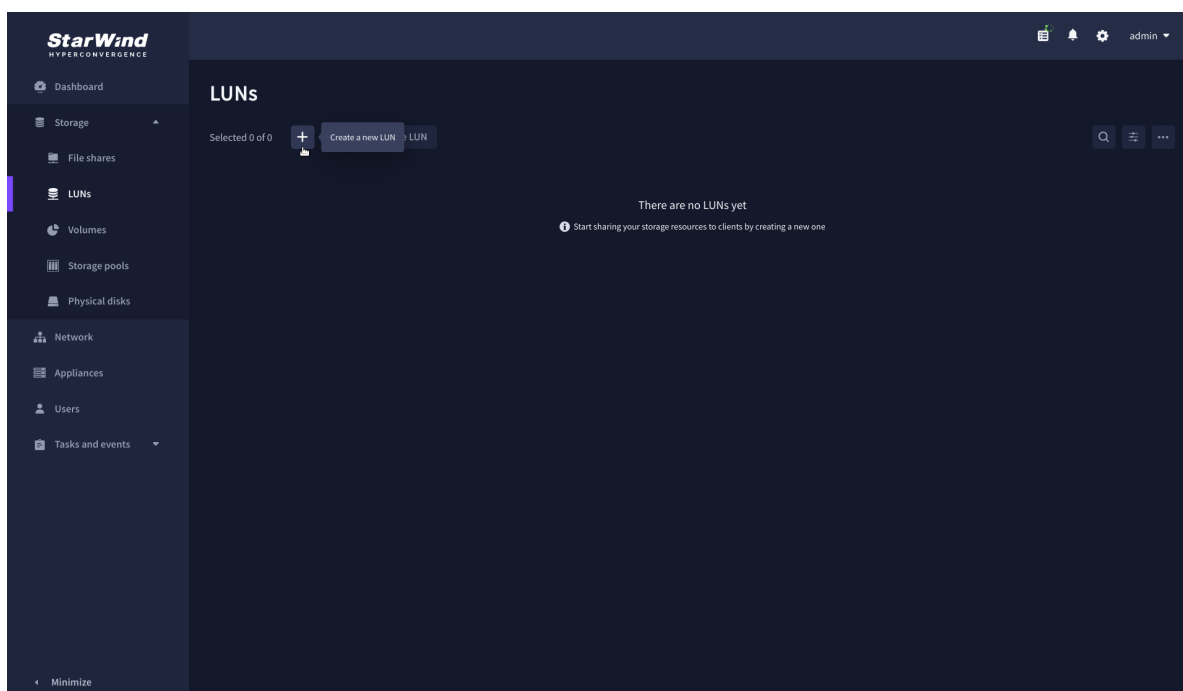
5. Review “Summary” and click the “Create” button to create the pool.



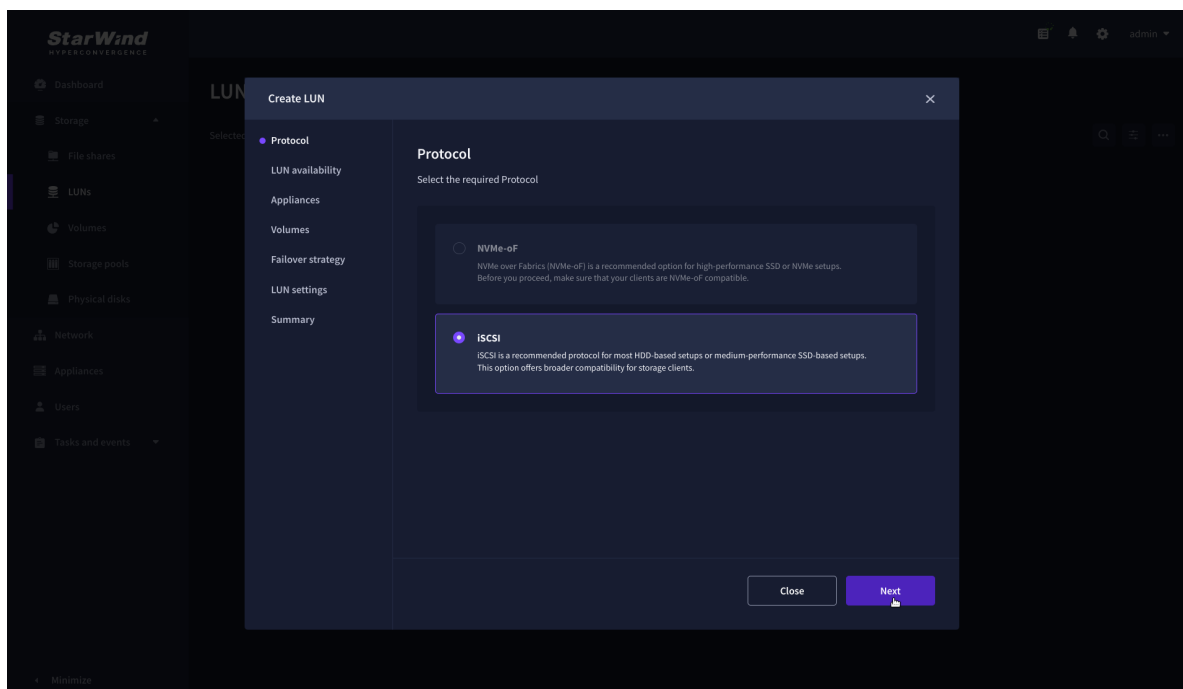
Create Ha Lun

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

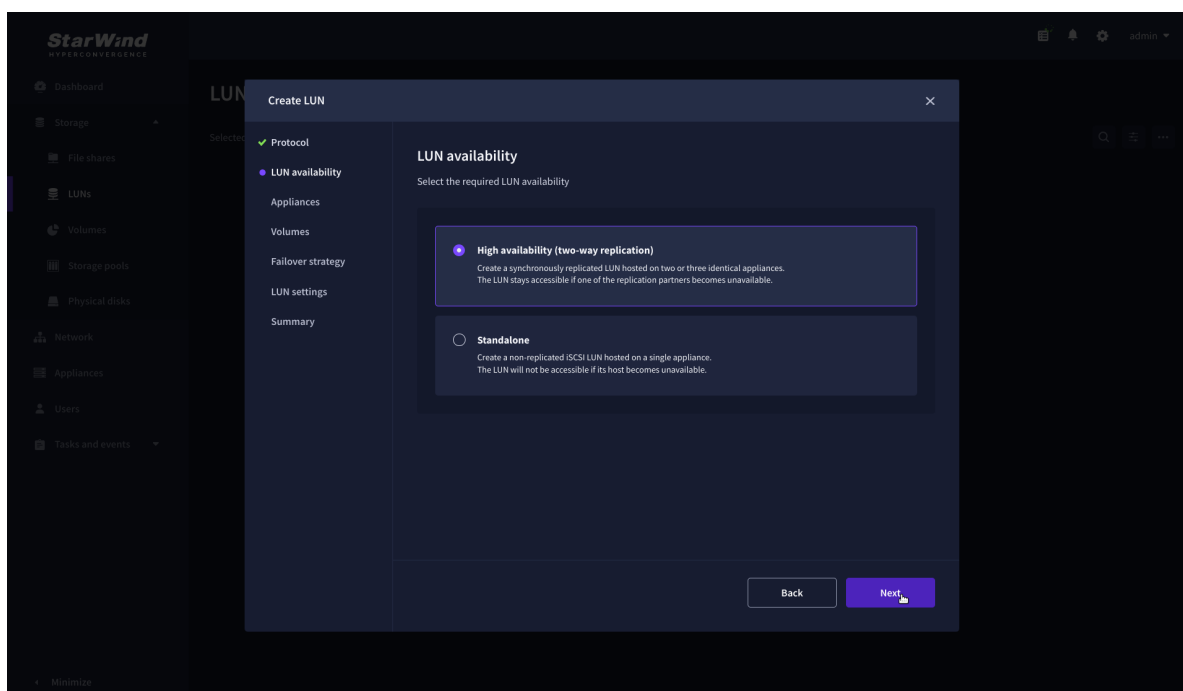
1. To create a virtual disk, click the Add button.



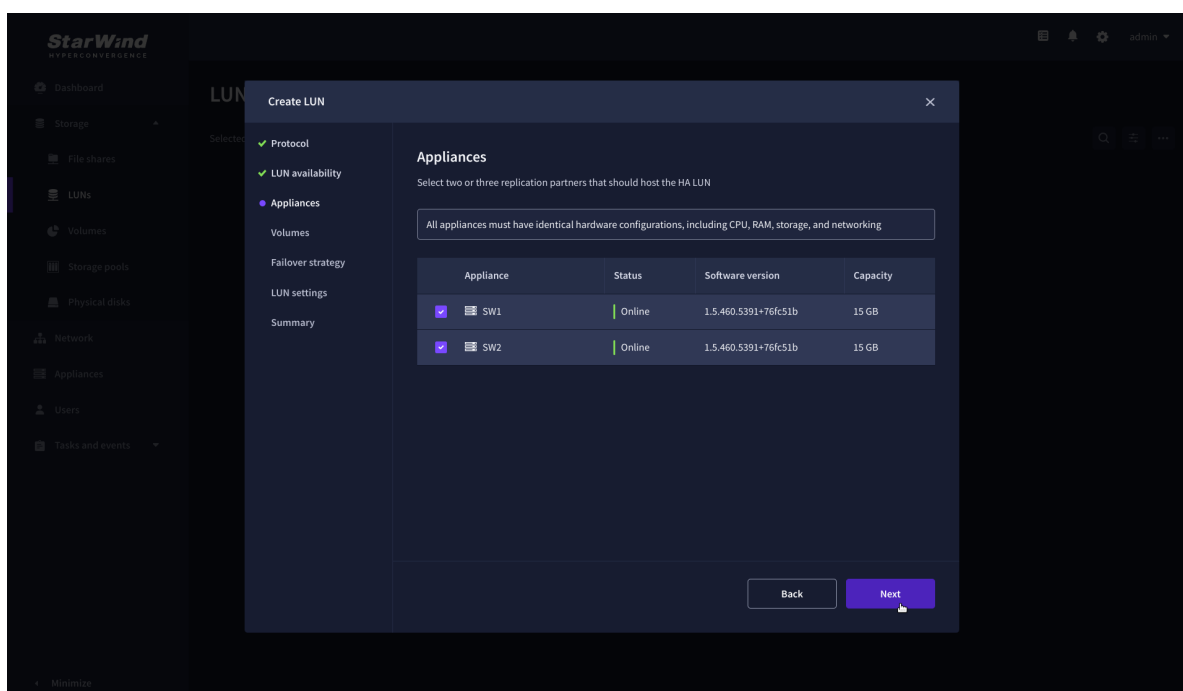
2. Select the protocol.



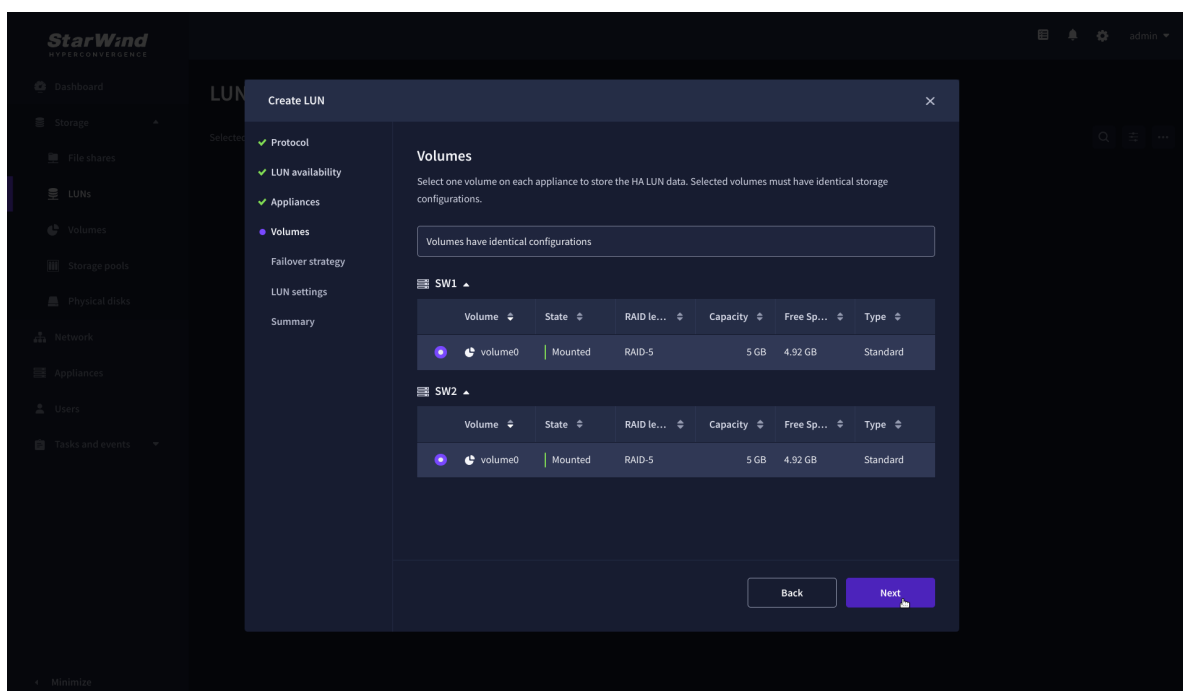
3. Choose the “High availability” LUN availability type.



4. Select the appliances that will host the LUN. Partner appliances must have identical hardware configurations, including CPU, RAM, storage, and networking.

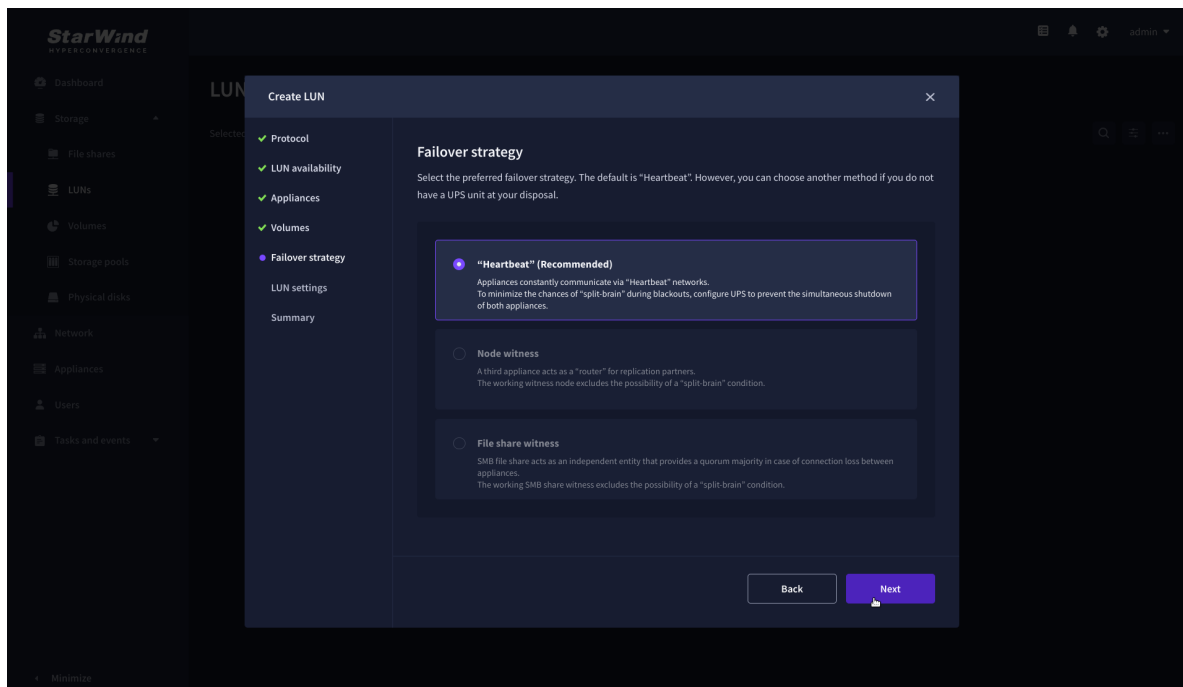


5. Select a volume to store the LUN data. Selected volumes must have identical storage configurations.

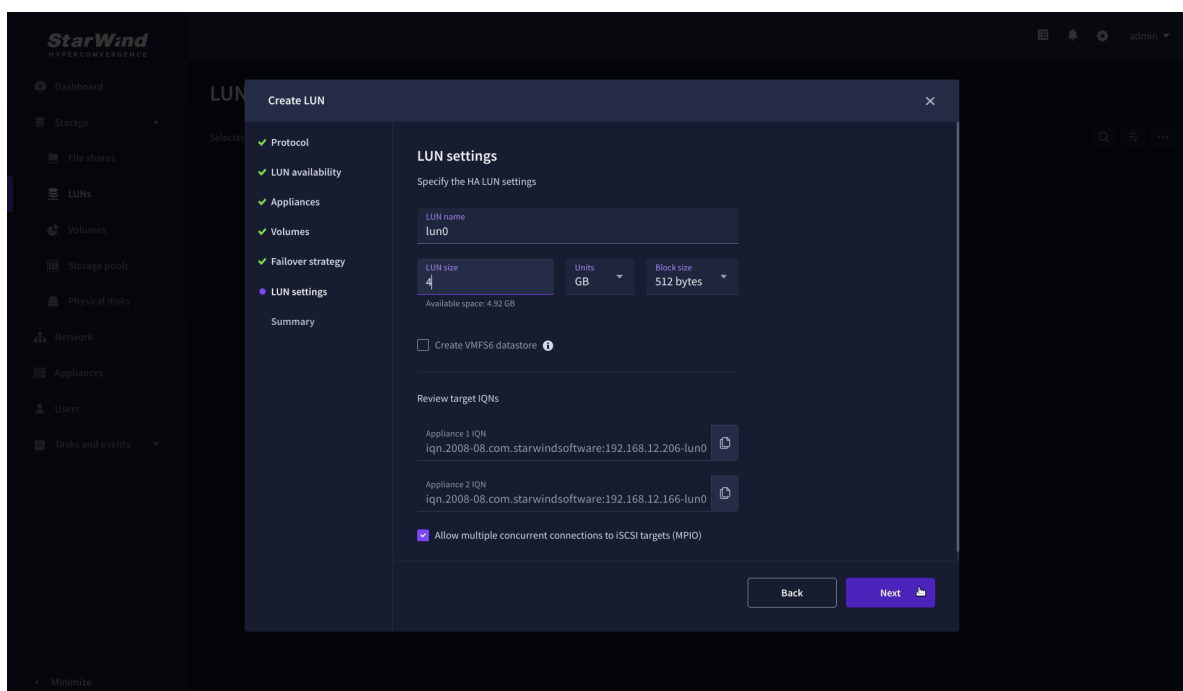


6. Select the “Heartbeat” failover strategy.

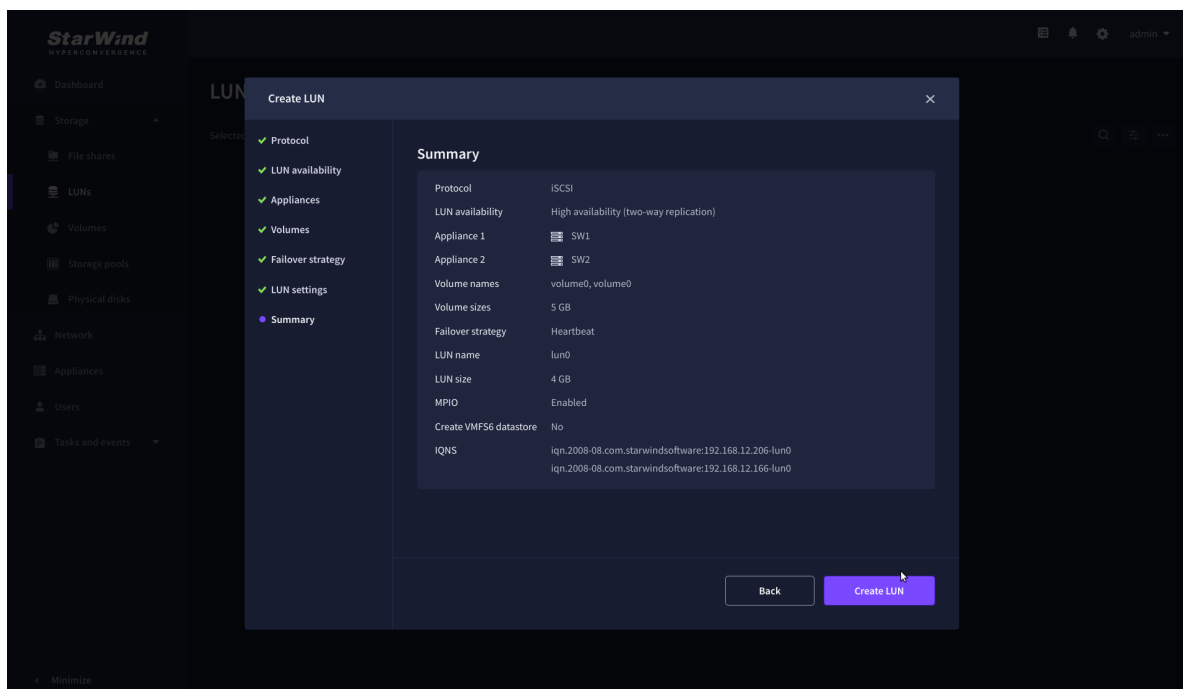
NOTE: To use the Node witness or the File share witness failover strategies, the appliances should have these features licensed.



7. Specify the HA LUN settings, e.g. name, size, and block size. Click Next.

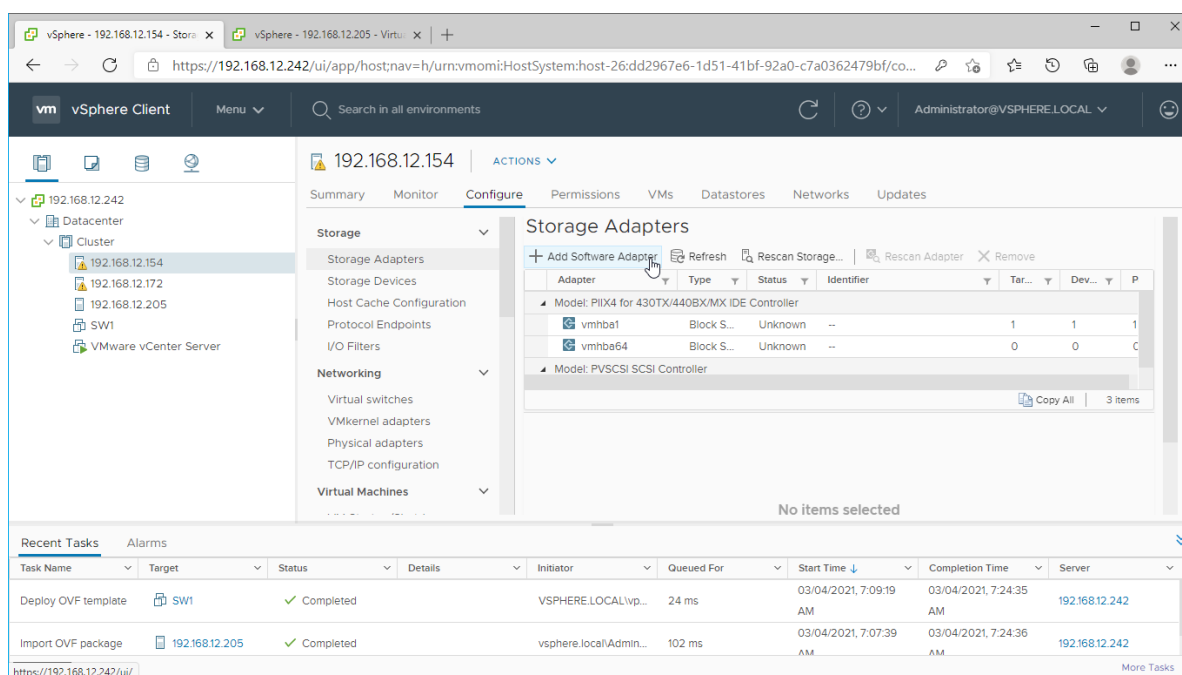


8. Review “Summary” and click the “Create” button to create the LUN.

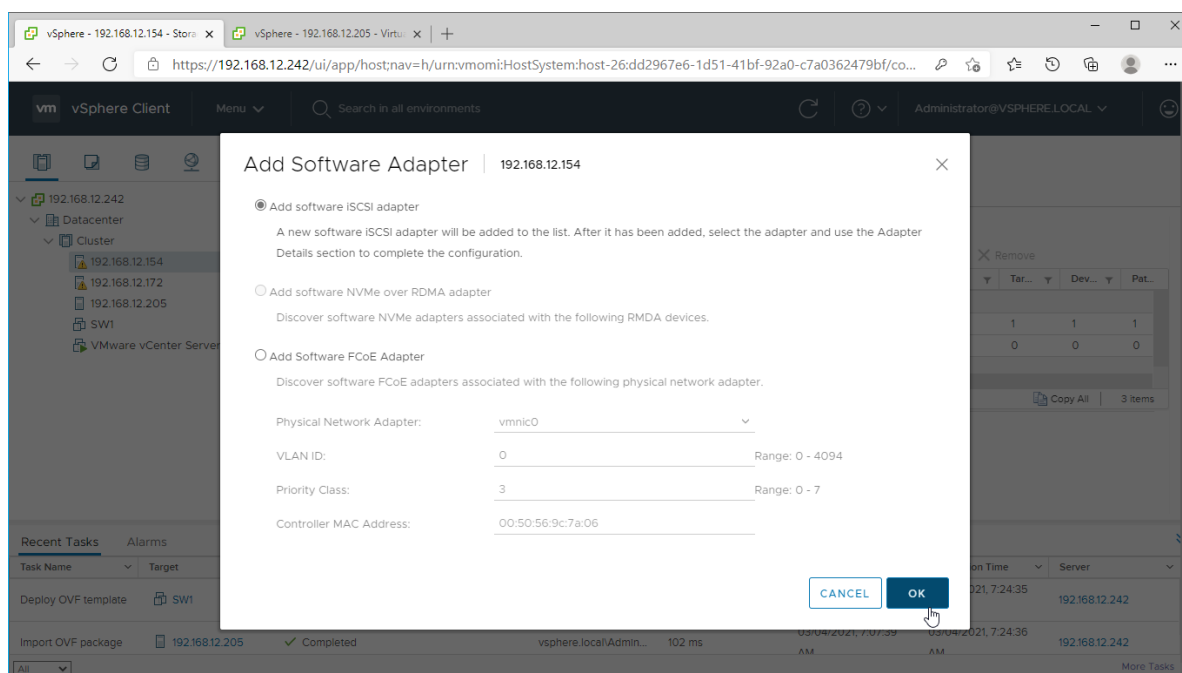


Connecting Starwind Luns To Vmware Vsphere Servers

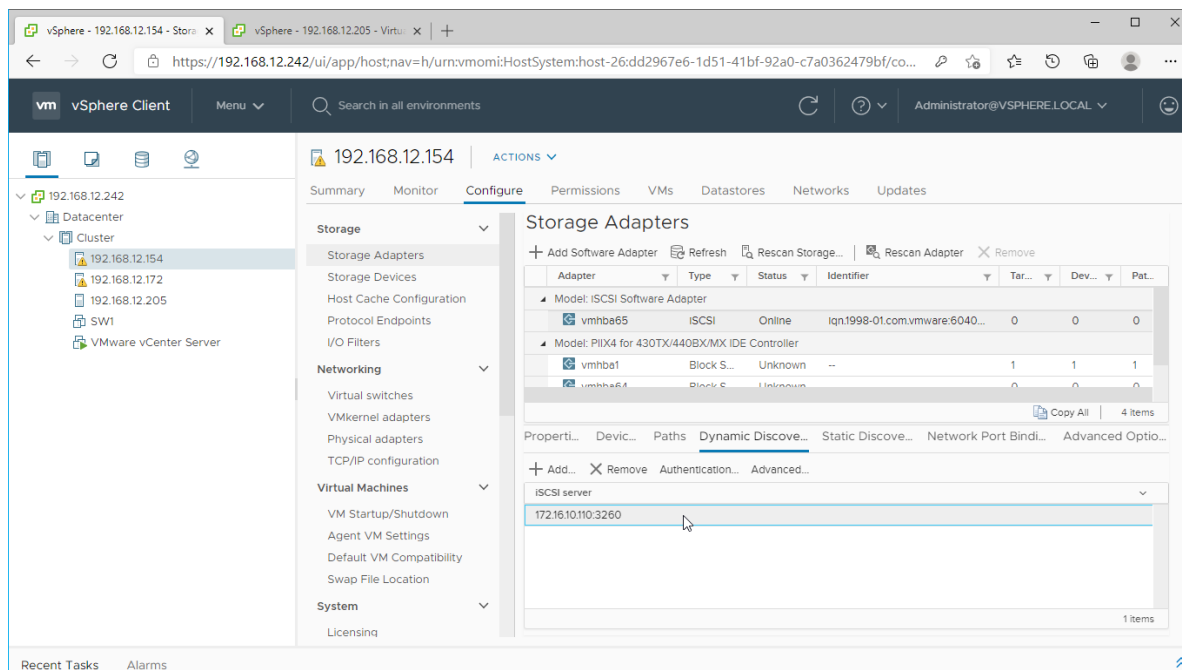
1. Log in to VMware vSphere Client.
2. Select the ESXi server in the sidebar-menu, then navigate to the “Configure” tab and open the “Storage Adapters” submenu page.
3. Click the “+Add Software Adapter” button to launch the corresponding wizard.



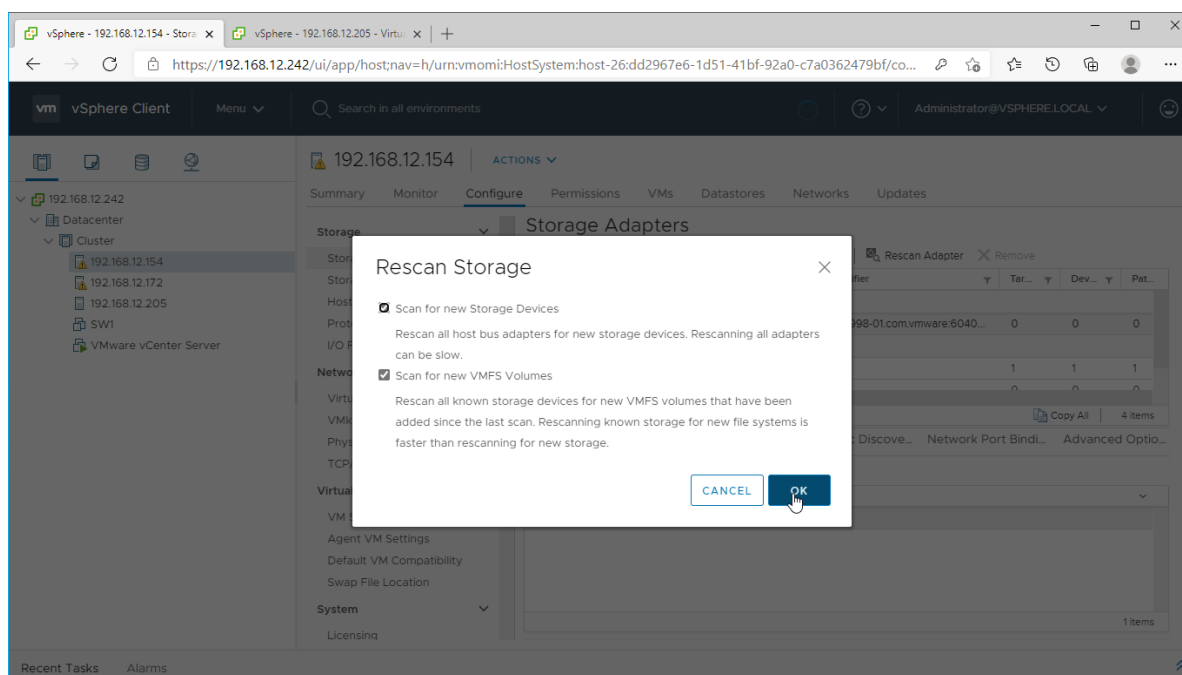
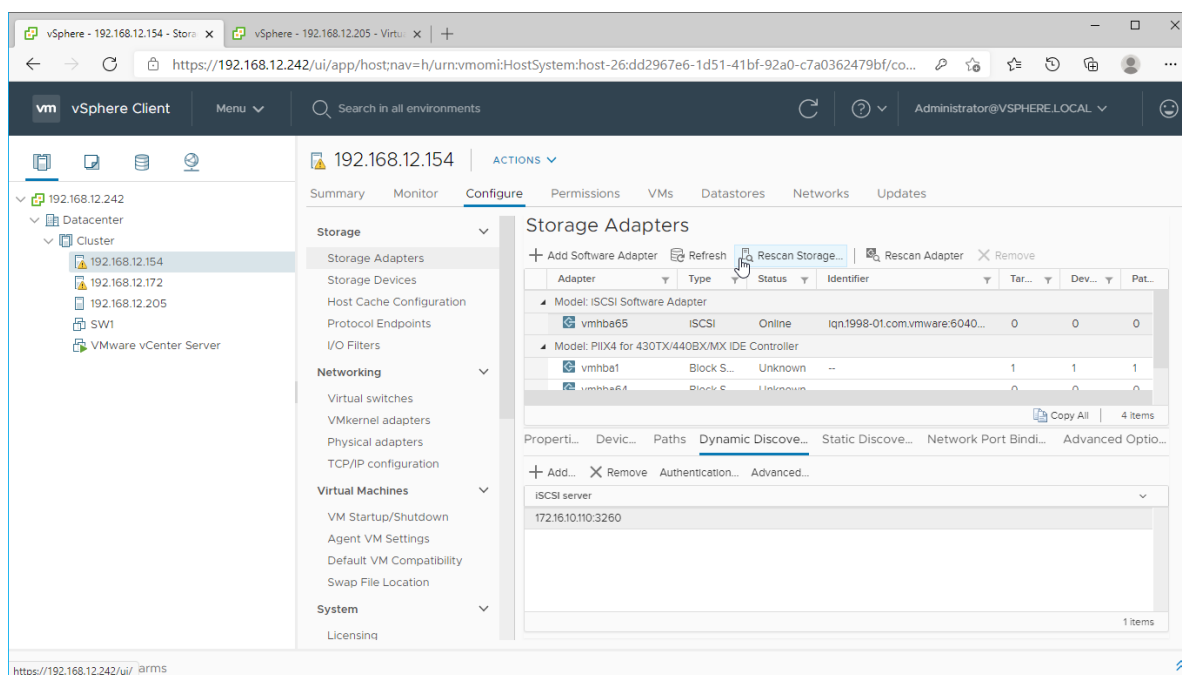
4. Mark the “Add software iSCSI adapter” option and click OK.



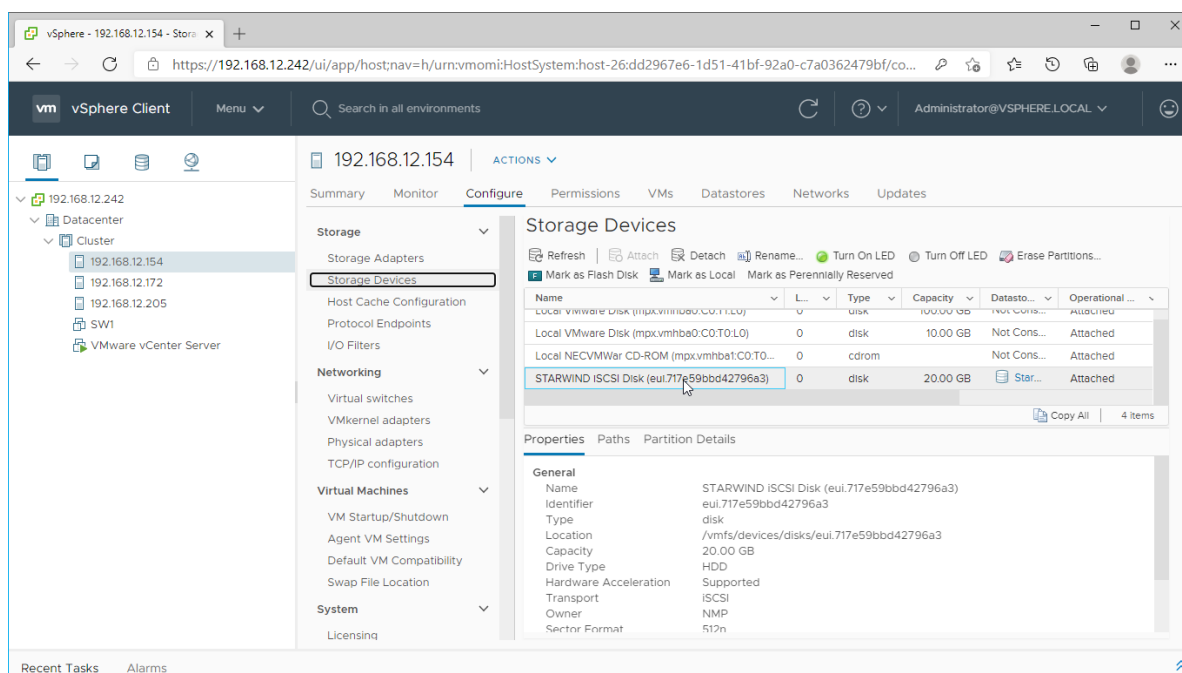
5. Add the IPv4 address of StarWind CVM Data\iSCSI network interface to the “Dynamic Discovery”. Save the configuration



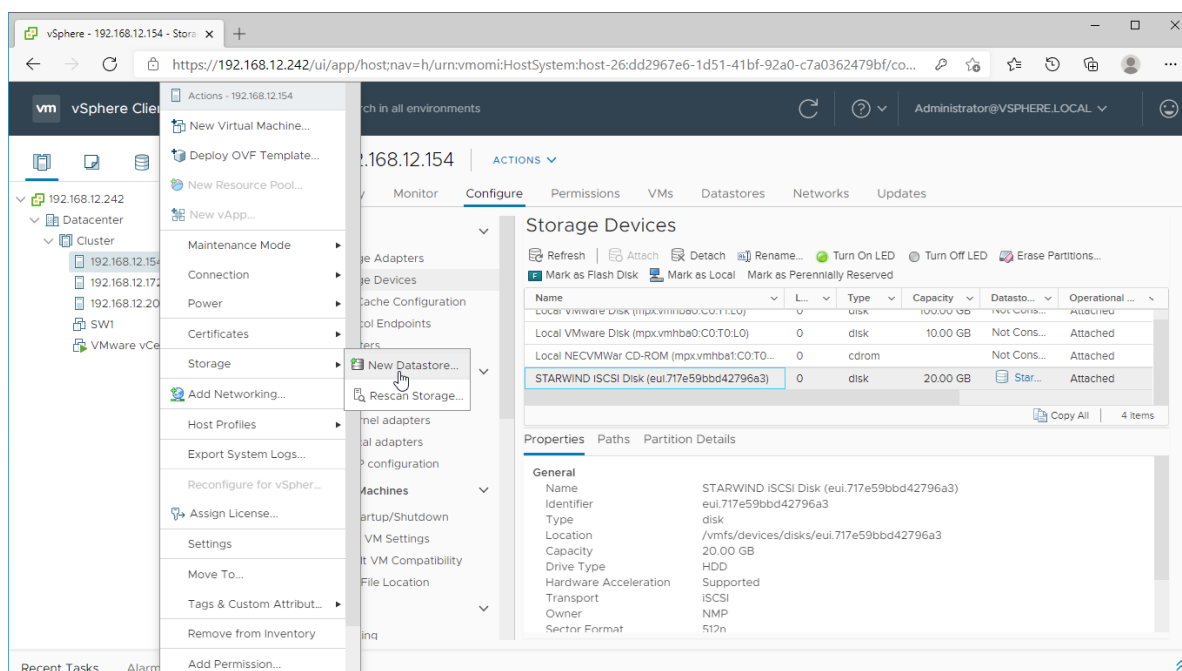
6. Click on the “Rescan” button to discover StarWind virtual disk.



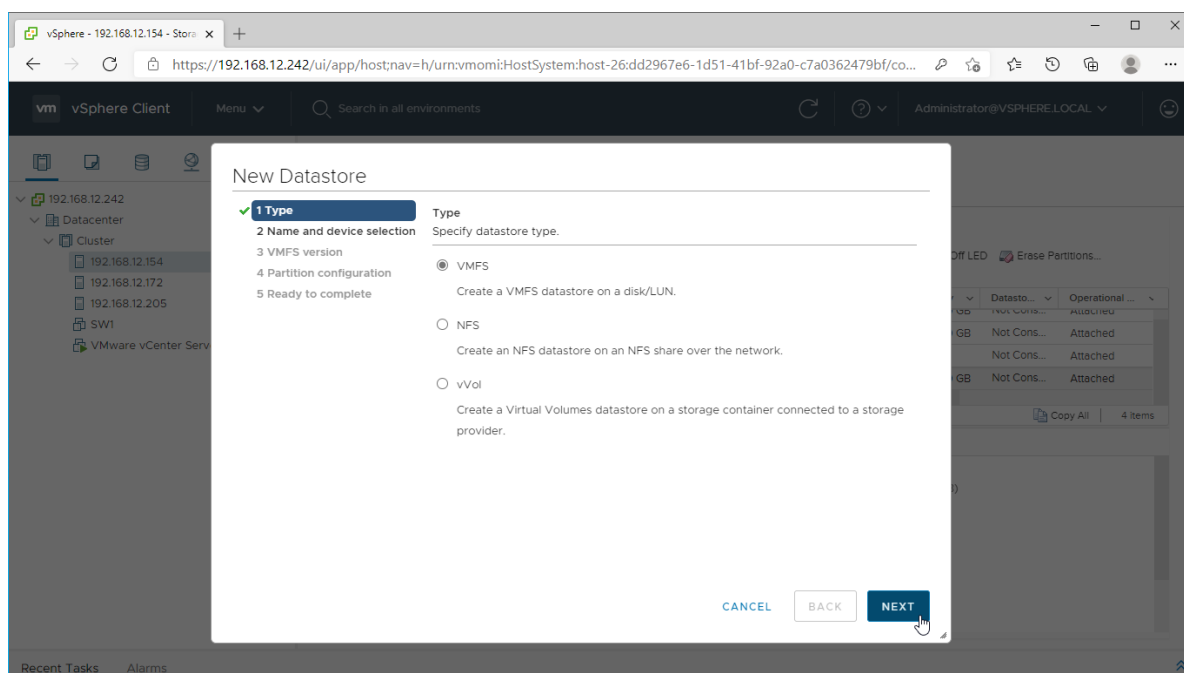
7. Once scanned, the created StarWind LUNs appear on the “Storage Devices” submenu page.



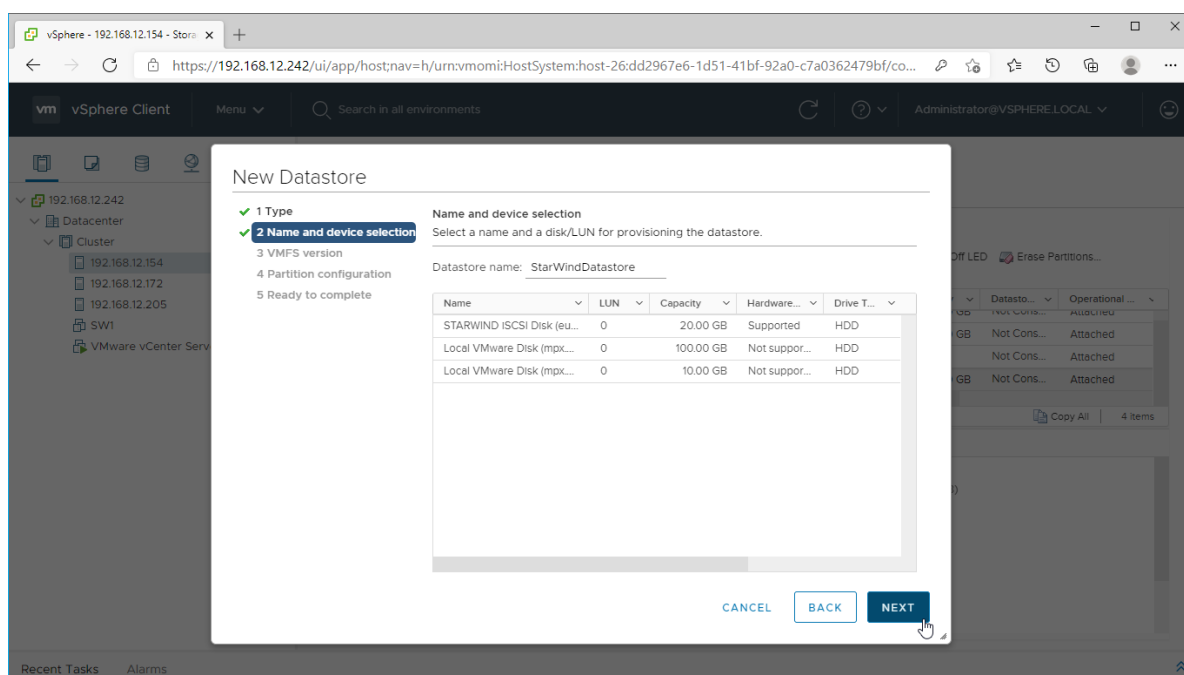
8. Right-click on the ESXi server to open the “Actions” menu, click on “Storage” and click the “New datastore” button.



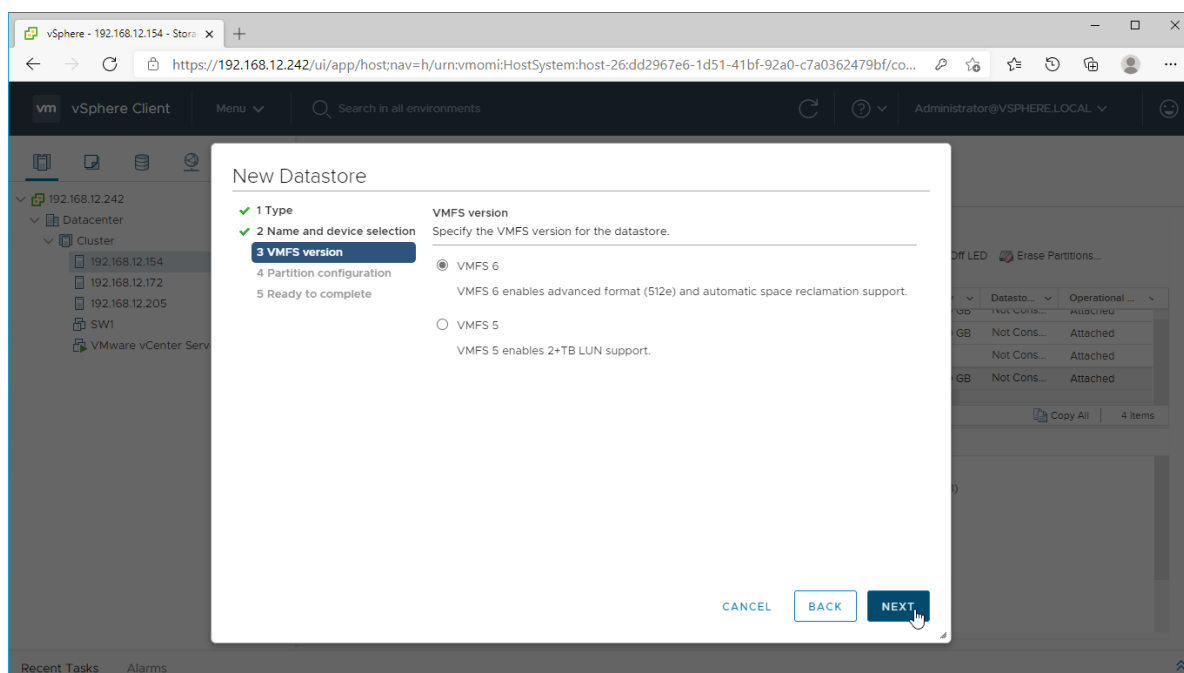
9. The Datastore creation wizard appears. Specify the Datastore type as VMFS.



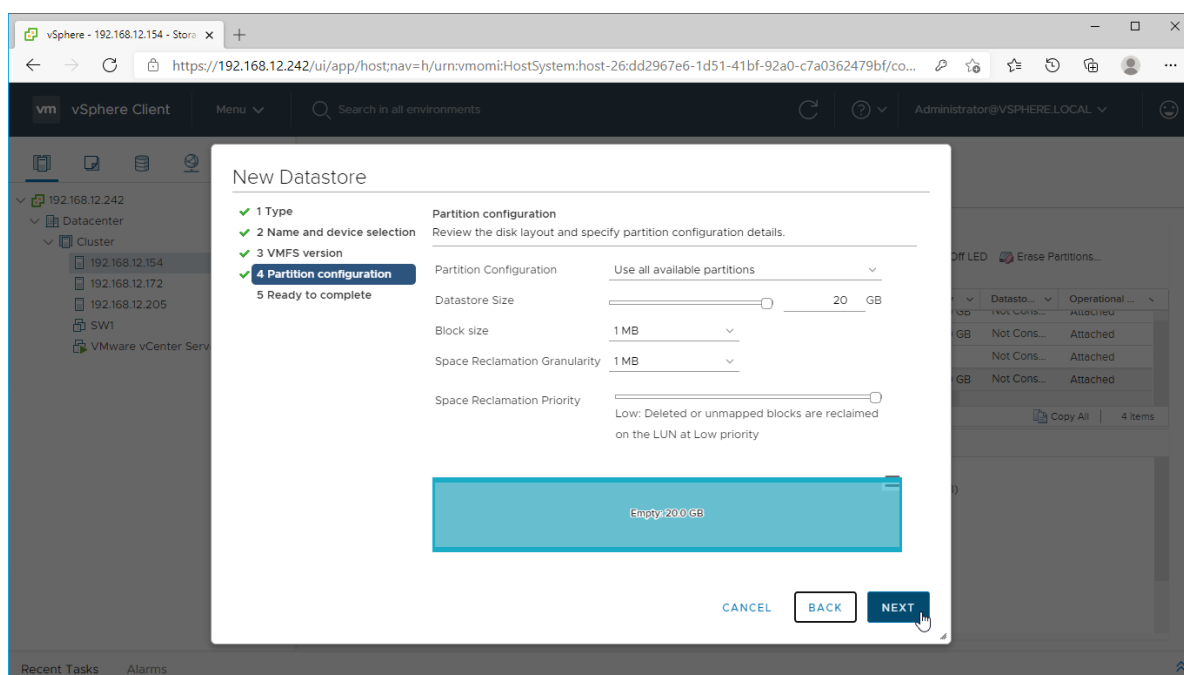
10. Specify the datastore name. Select the StarWind virtual disk.



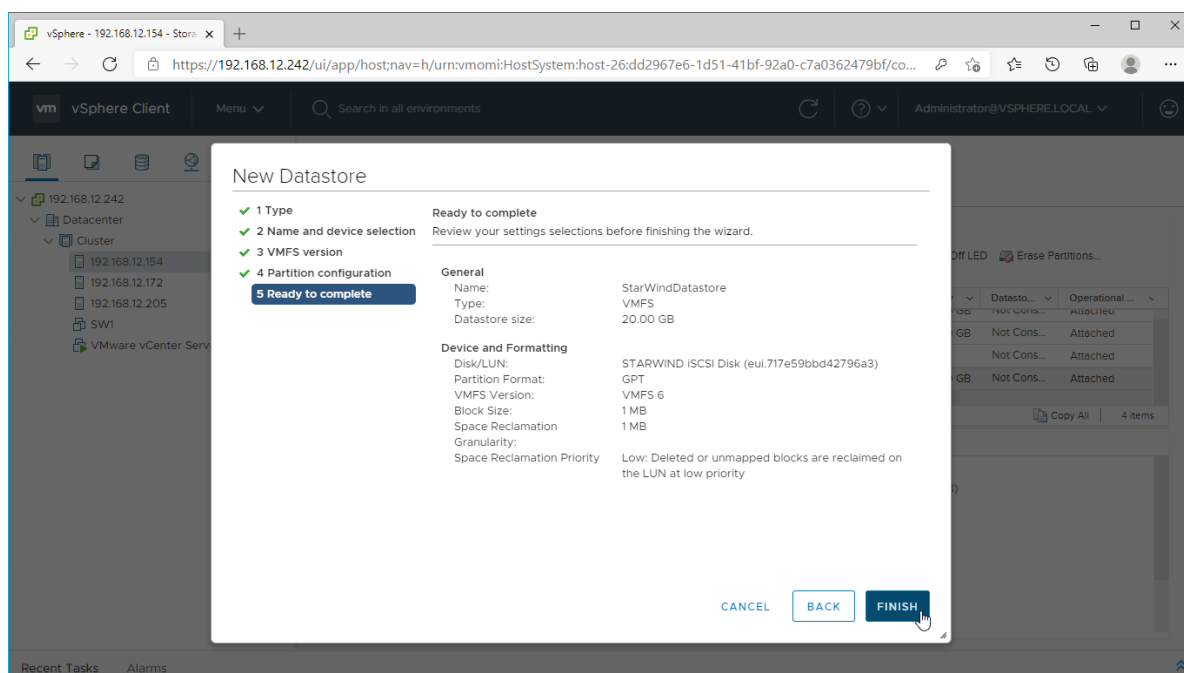
11. Specify the VMFS6 version for the datastore.



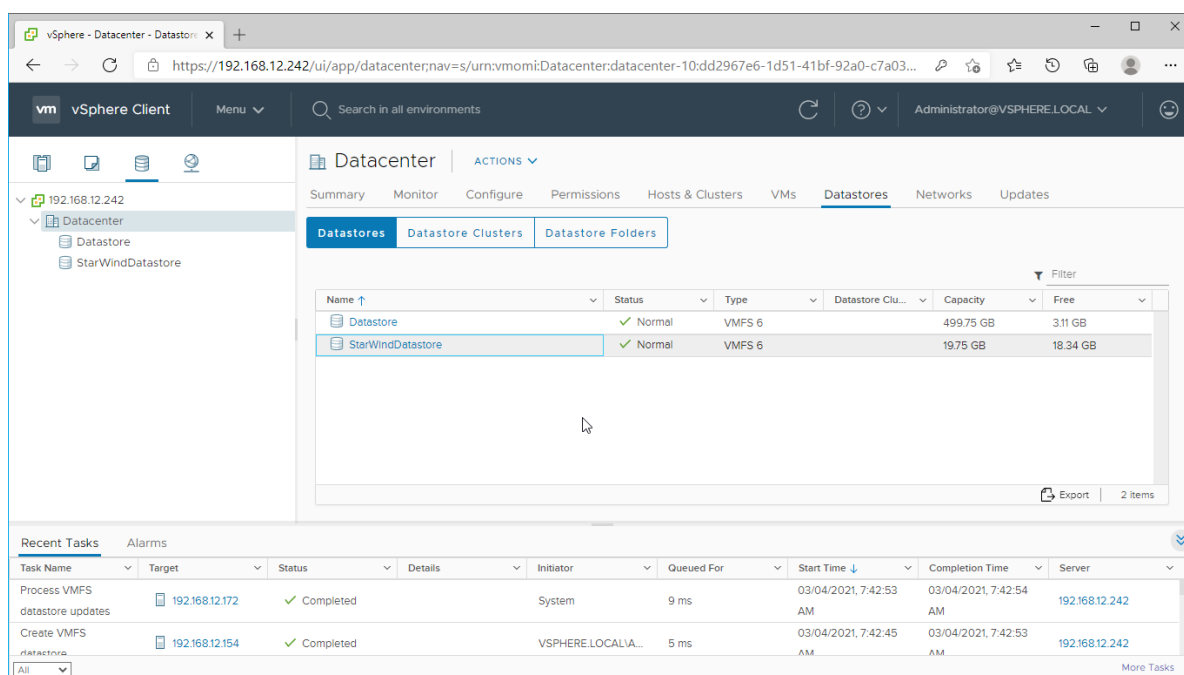
12. Specify the datastore size using the entire disk capacity.



13. Review the configuration summary and click “Finish” to create the datastore.



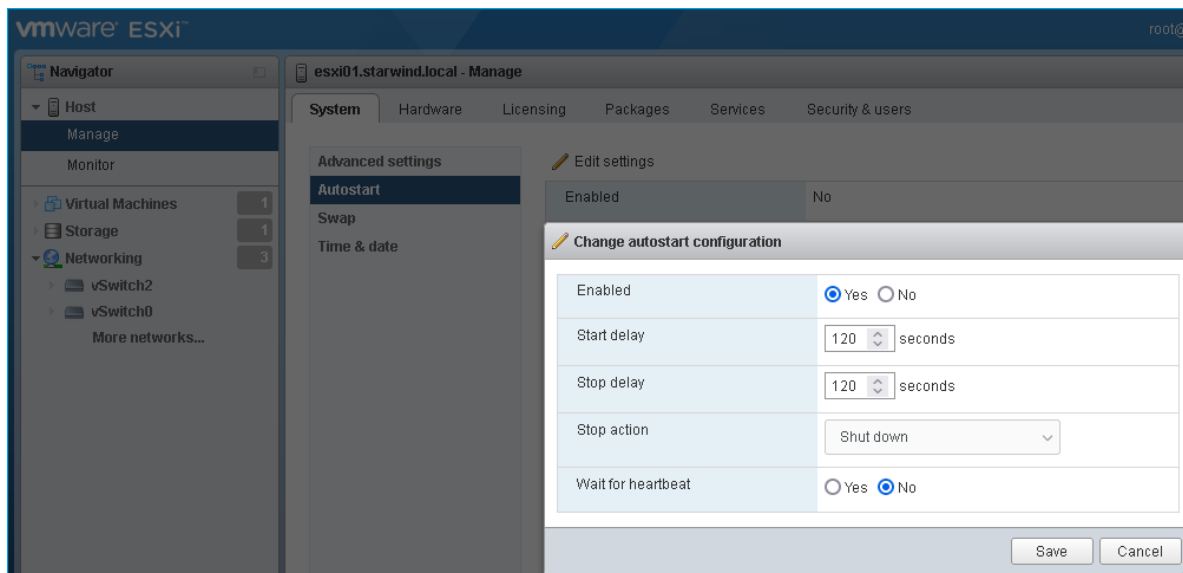
14. Check the StarWind datastore in the Datastores tab.



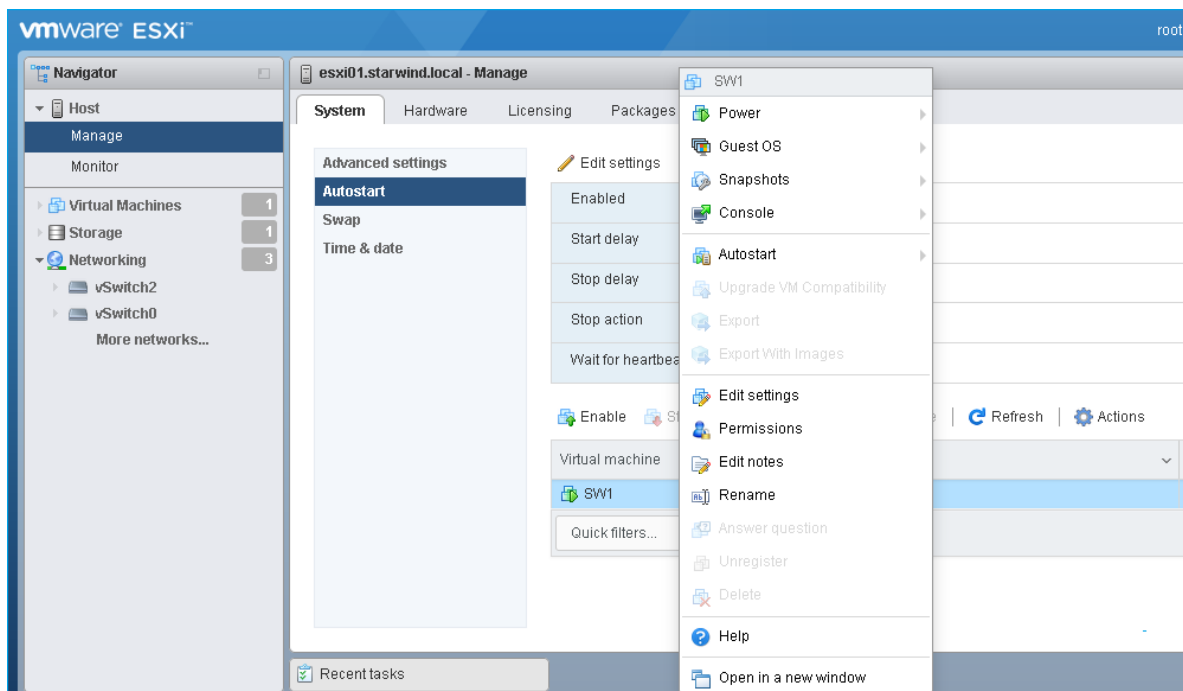
15. Repeat the configuration steps 6-13 to add newly created StarWind LUNs as datastores on your VMware vSphere cluster.

Configuring Starwind Vms Startup/shutdown

1. Setup the VMs startup policy on both ESXi hosts from Manage -> System tab in the ESXi web console. In the appeared window, check Yes to enable the option and choose the stop action as Shut down. Click Save to proceed.



2. To configure a VM autostart, right-click on the VM, navigate to Autostart and click Enable.

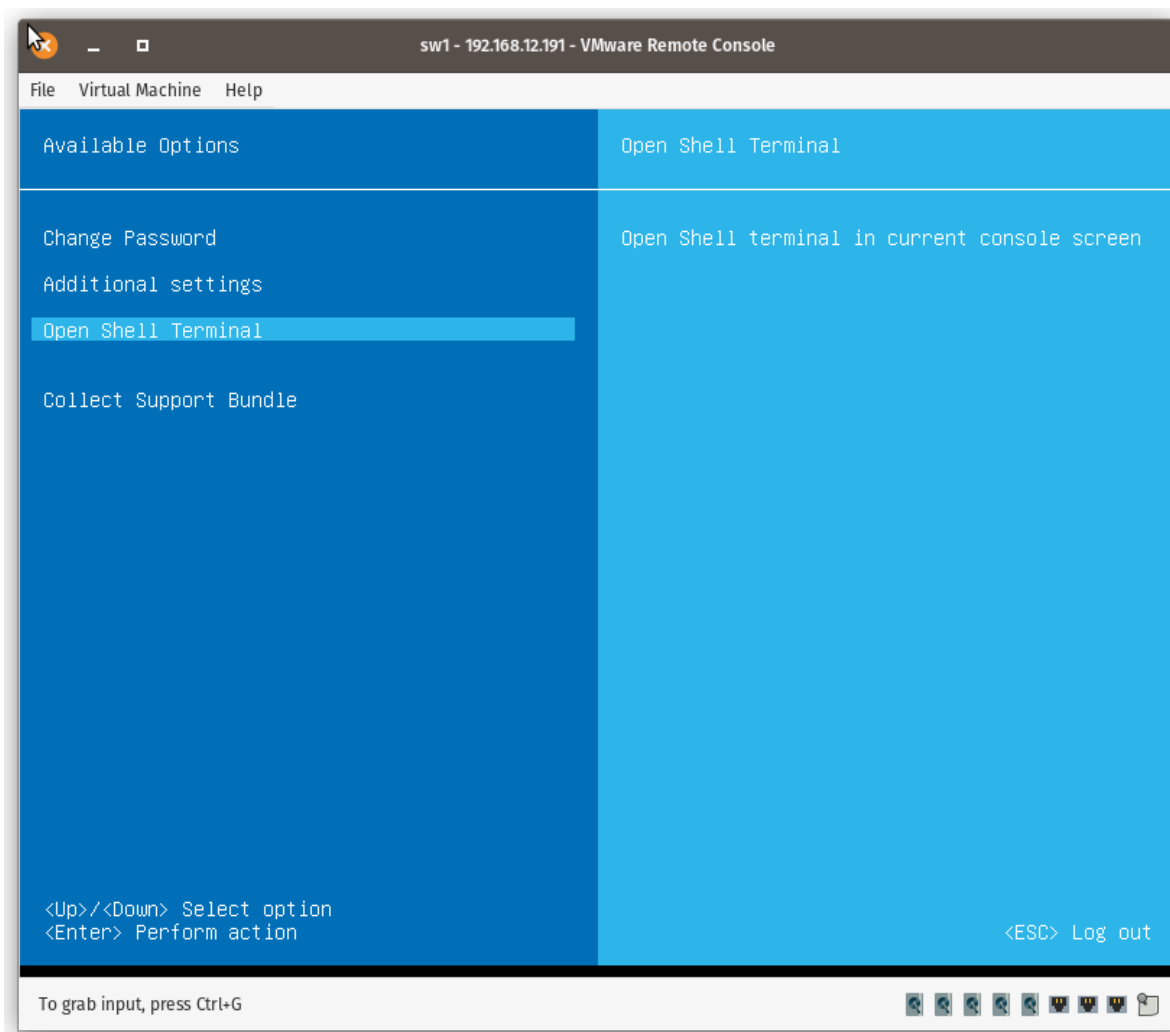


3. Complete the actions above on StarWind VM located on all ESXi hosts.

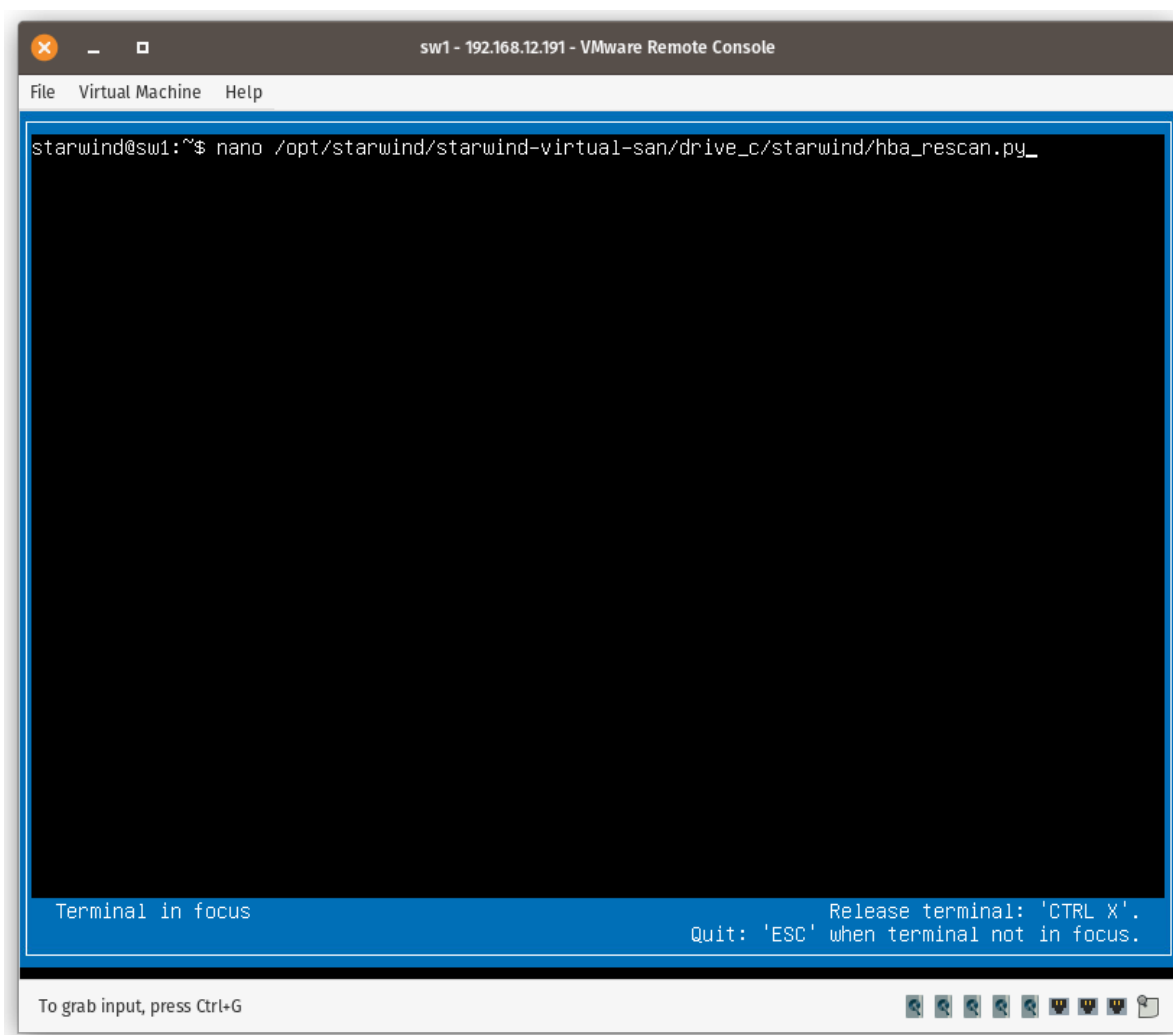
4. Start the virtual machines on all ESXi hosts.

Configuring An Automatic Storage Rescan

1. Connect to the appliance via Shell Terminal in a Text-based User Interface (TUI) or using a remote SSH terminal.



2. Edit file `/opt/starwind/starwind-virtual-san/drive_c/starwind/hba_rescan.py` with the following command: `sudo nano /opt/starwind/starwind-virtual-san/drive_c/starwind/hba_rescan.py`



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:

```
$esxi_host = "IP address"
$username = "Login"
$password = "Password"
```

```

GNU nano 4.8 /opt/starwind/starwind-virtual-san/drive_c/starwind/hba_rescan.py
#!/usr/bin/env python3
####
# This script rescans all HBA controllers on ESXi hosts and
# set 'VMW_PSP_RR' policy to StarWind LUNs.
####

import ssl
from pyVmomi import vim, vmodl
from pyVim.connect import SmartConnect, Disconnect

# Disable SSL certificate verification for simplicity
context = ssl.create_default_context()
context.check_hostname = False
context.verify_mode = ssl.CERT_NONE

# vSphere connection details
# vcenter_server = 'vcenter.example.com'
esxi_host = '192.168.12.51'
username = 'root'
password = 'SW@sed33'

def rescan_storage(host):

    storage_system = host.configManager.storageSystem
    storage_system.RescanAllHba()
    storage_system.RescanVmfs()

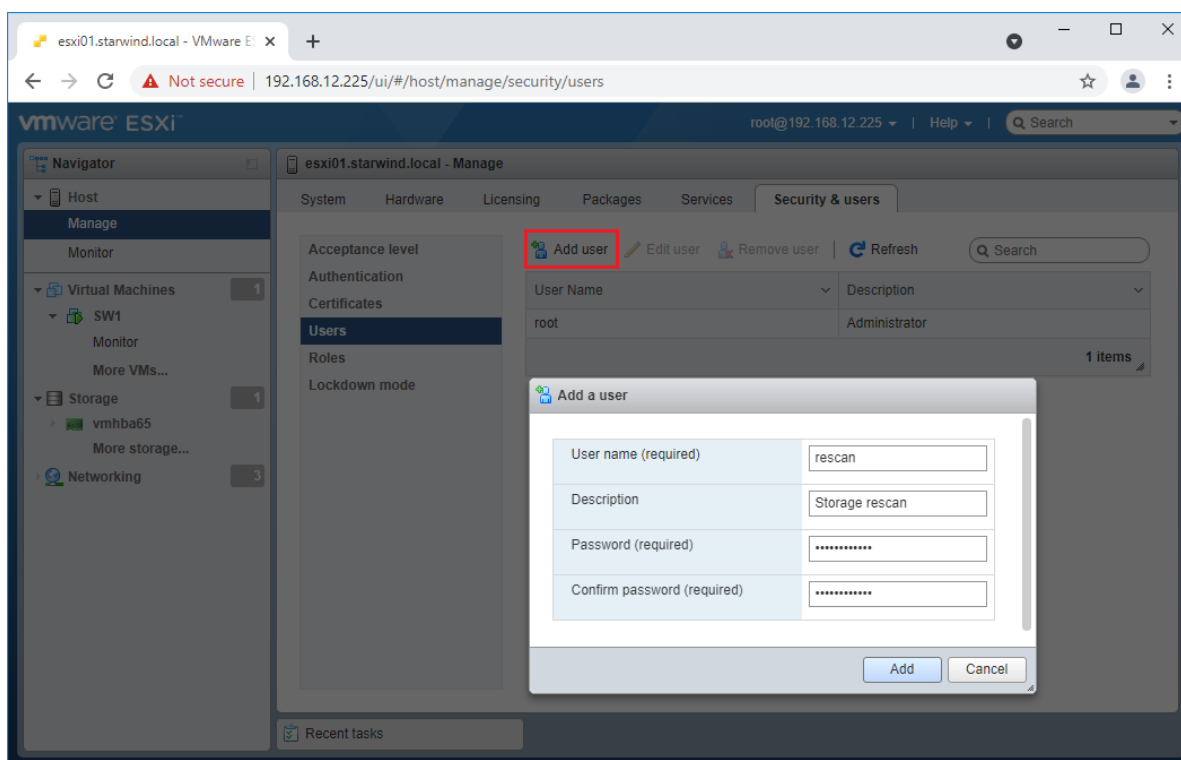
[ Read 55 lines ]
^G Get Help      ^O Write Out    ^W Where Is     ^K Cut Text     ^J Justify      ^C Cur Pos
^X Exit          ^R Read File    ^\ Replace      ^U Paste Text   ^I To Spell     ^_ Go To Line
Terminal in focus
Release terminal: 'CTRL X'.
Quit: 'ESC' when terminal not in focus.
To grab input, press Ctrl+G

```

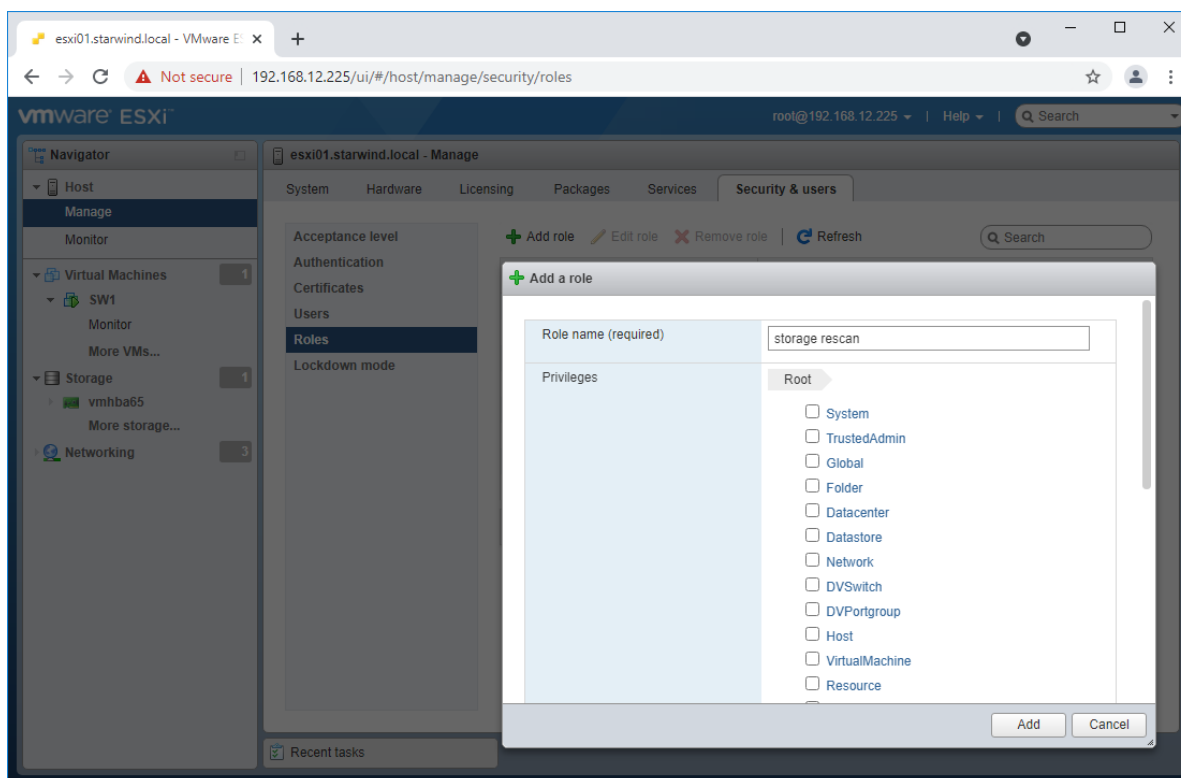
NOTE: In some cases, the rescan script can be changed and storage rescan added for another ESXi host. Appropriate lines should be duplicated and changed with properly edited variables if required.

NOTE: In some cases, it makes sense to create a separate ESXi user for storage rescans. To create the user, please follow the steps below:

4. Log in to ESXi with the VMware Host Client. Click Manage, and under Security & users tab, in the Users section click Add user button. In the appeared window, enter a user name, and a password.



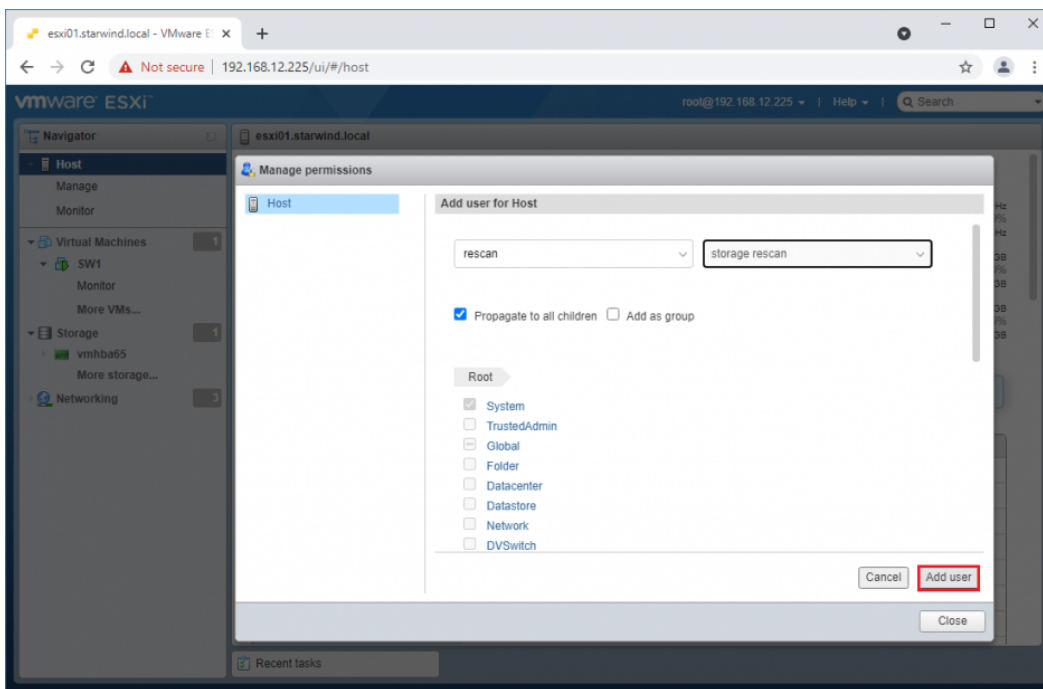
5. Create a new Role, under Roles section, and click New Role button. Type a name for the new role. Select privileges for the role and click OK.
The following privileges might be assigned: Host – Inventory, Config, Local Cim, and Global – Settings.



6. Assign permission to the storage rescan user for an ESXi host – right-click Host in the VMware Host Client inventory and click Permissions. In the appeared window click Add user.

7. Click the arrow next to the Select a user text box and select the user that you want to assign a role to. Click the arrow next to the Select a role text box and select a role from the list.

(Optional) Select Propagate to all children or Add as group. Click Add user and click Close.

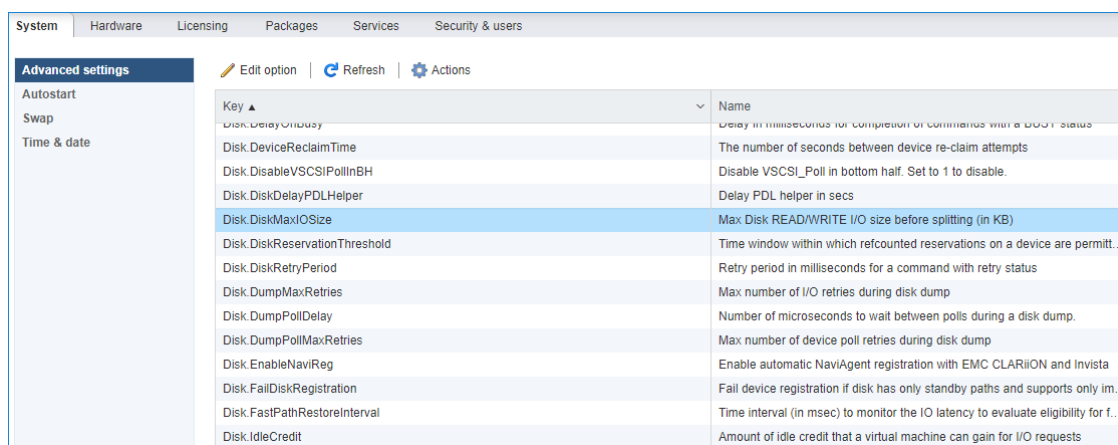


Make sure that rescan script is working and execute it from the VM: `sudo python3 /opt/starwind/starwind-virtual-san/drive_c/starwind/hba_rescan.py`

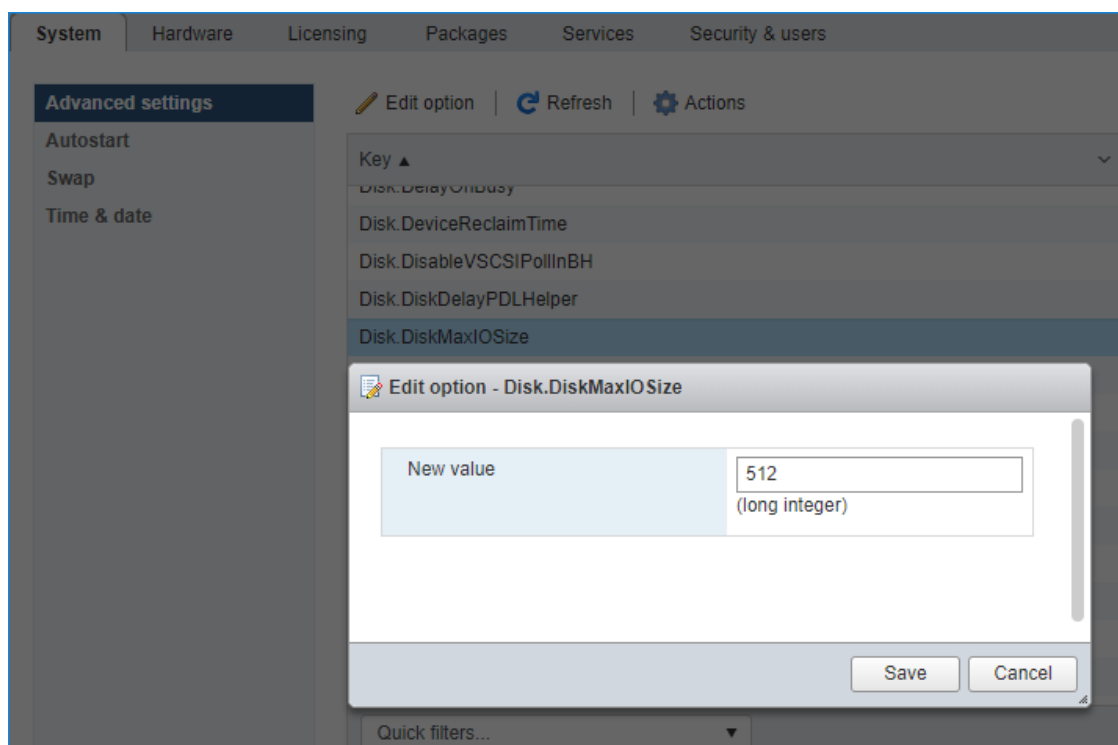
4. Repeat all steps from this section on the other ESXi hosts.

Performance Tweaks

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



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



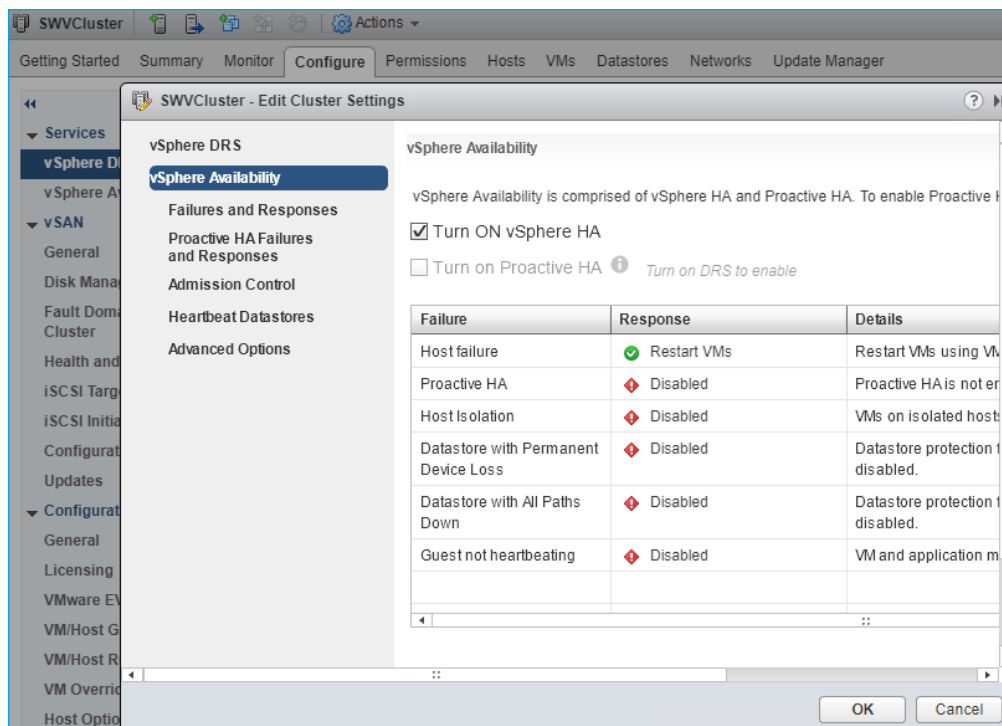
3. To optimize performance change I/O scheduler options according to the article below:
<https://knowledgebase.starwindsoftware.com/guidance/starwind-vsan-for-vsphere-changing-linux-i-o-scheduler-to-optimize-storage-performance/>

NOTE: Changing Disk.DiskMaxIOSize to 512 might cause startup issues with Windows-based 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: To provide high availability for clustered VMs, deploy vCenter and add ESXi hosts to the cluster.

Click on Cluster -> Configure -> Edit and check the turn on vSphere HA option if it's

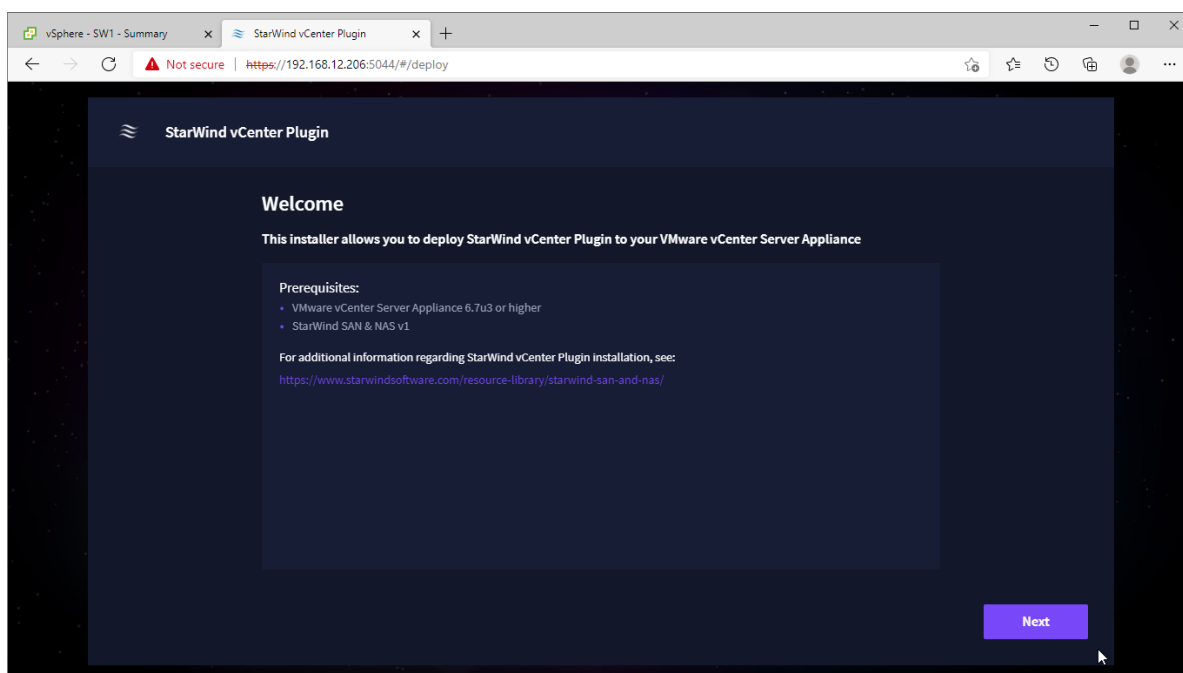
licensed.



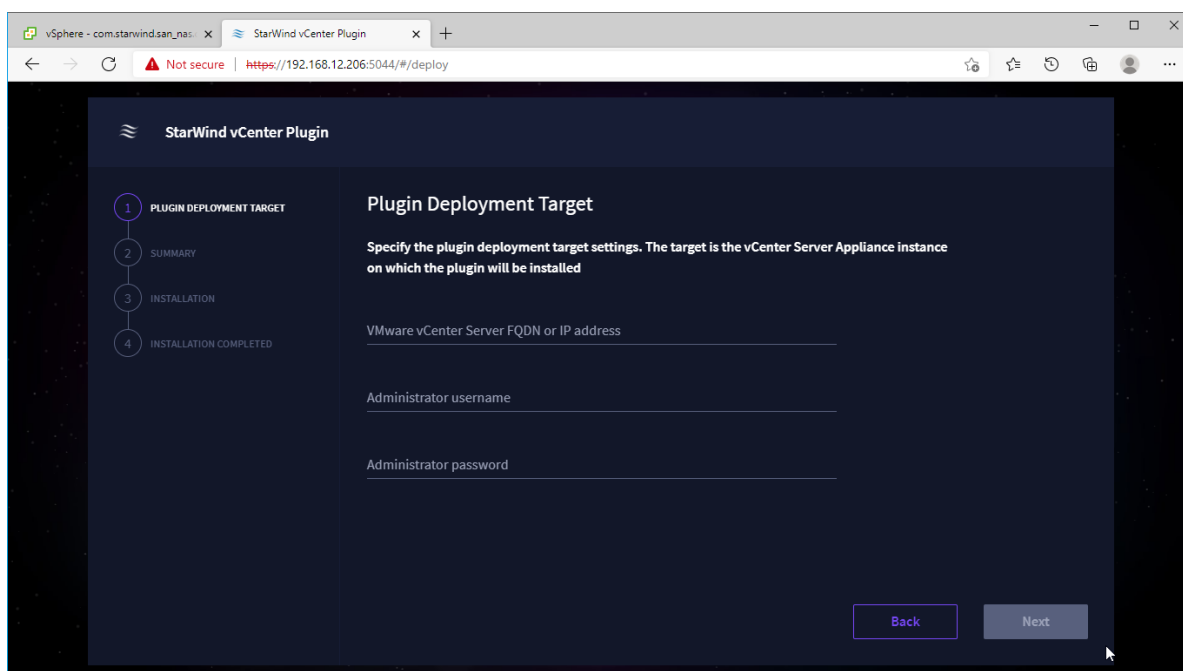
Installing Starwind Vcenter Plugin

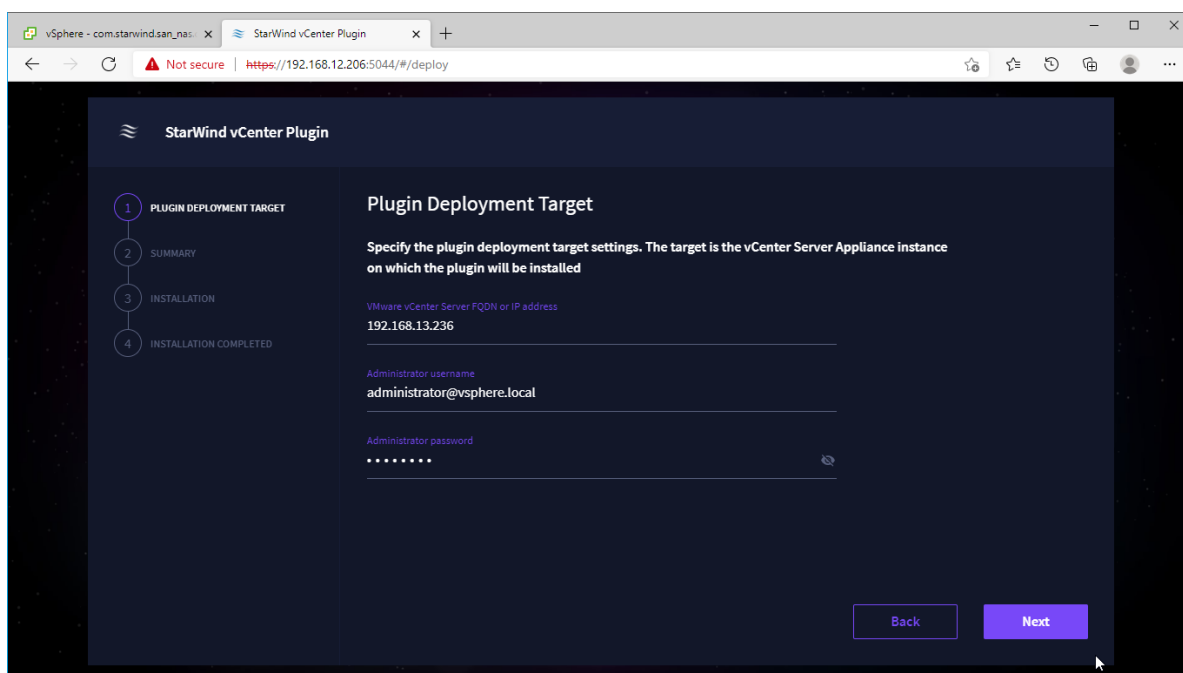
NOTE: This step is optional. StarWind vCenter plugin integrates the Controller Virtual Machines management into VMware vSphere user interface allowing managing compute and storage resources from a single web console.

1. To install the StarWind Plugin ensure that the version of your VMware vCenter Server Appliance 7.0 or newer, then click Next.

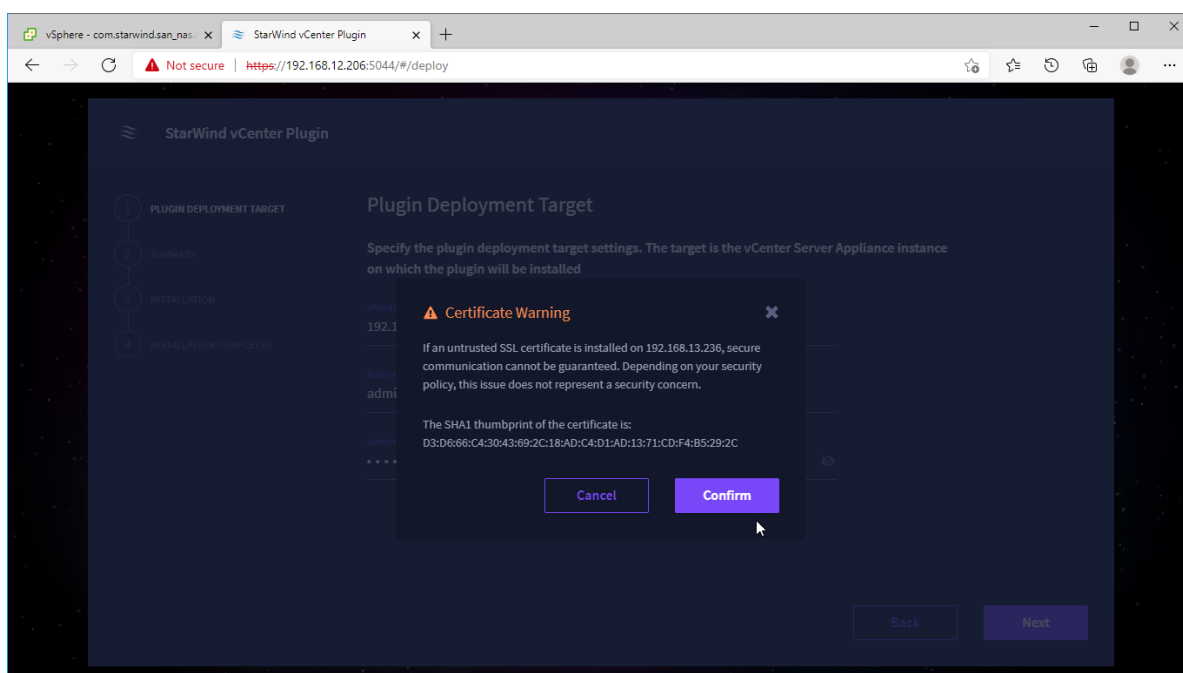


2. Specify the vCenter Server FQDN or IP Address and administrator credentials and click Next.

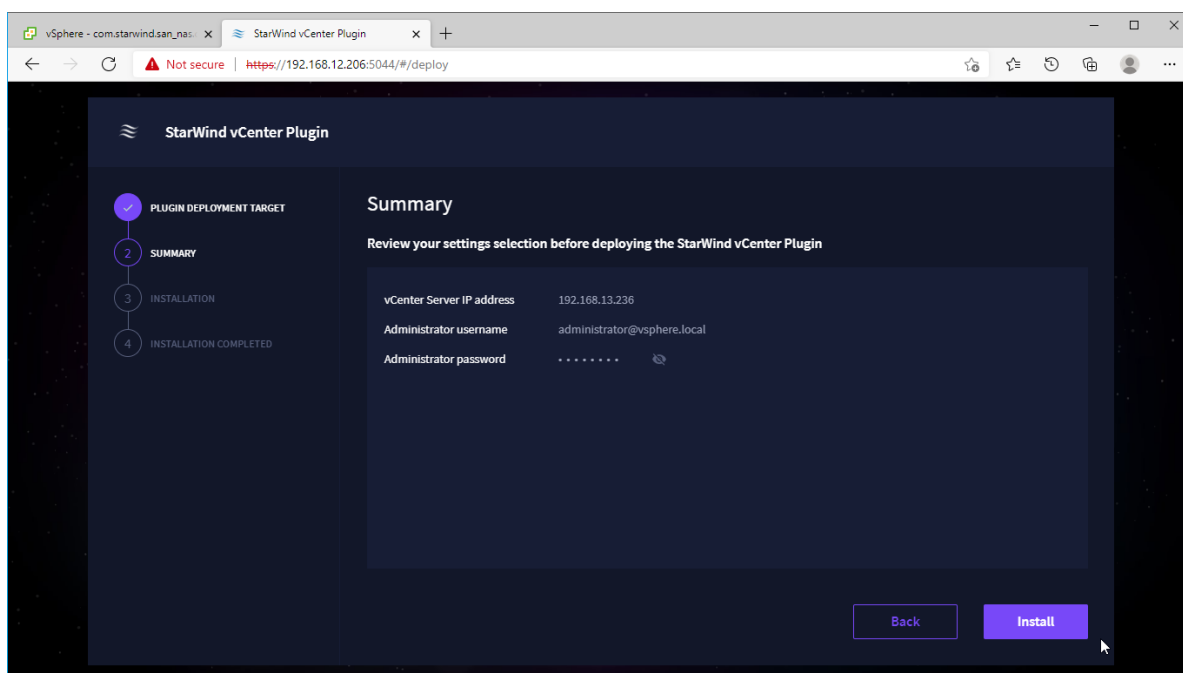




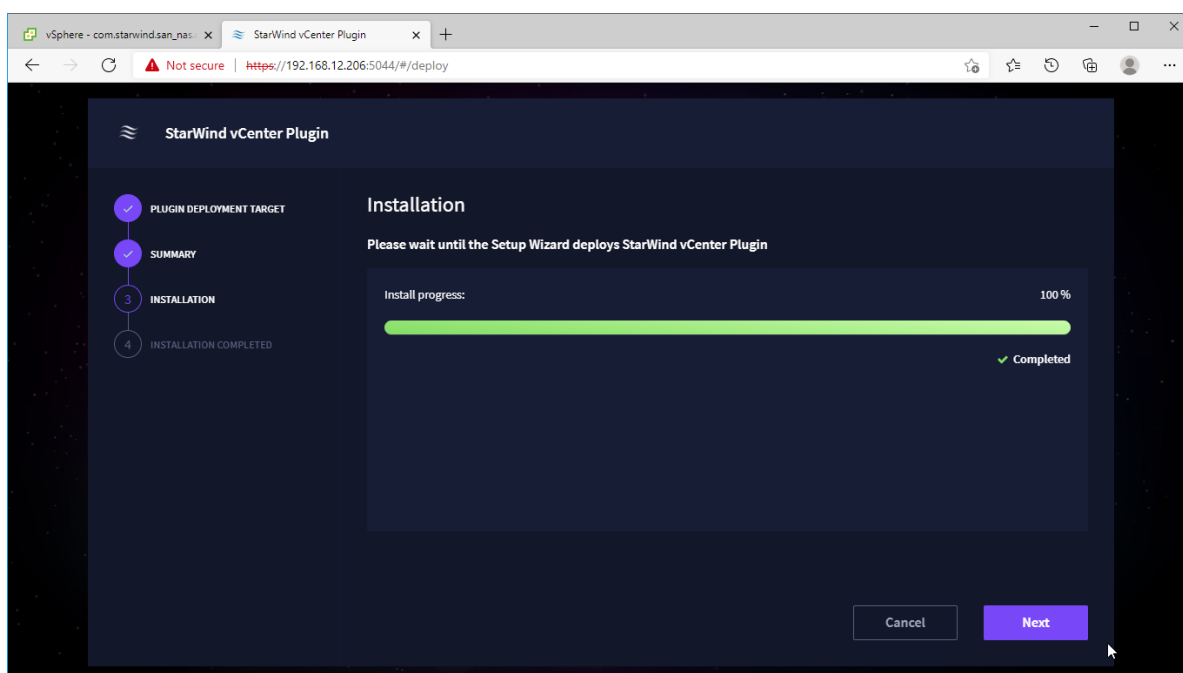
3. Confirm the connection to your vCenter Server Appliance.



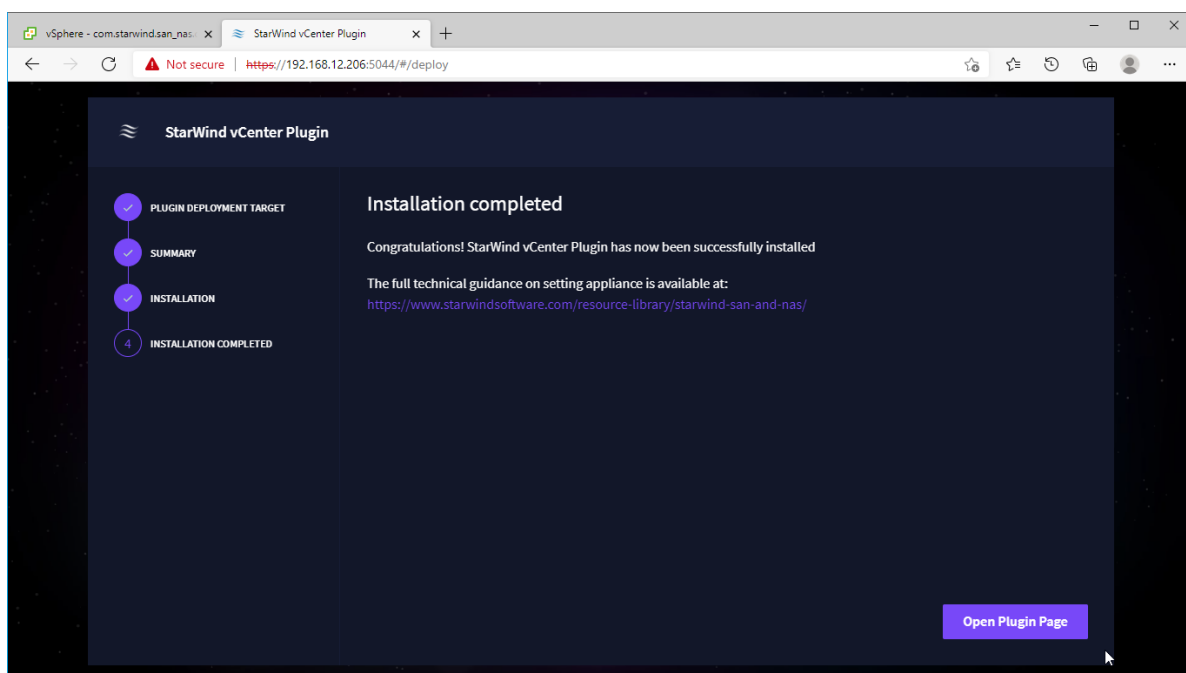
4. Review Summary and click the Install button.



5. Wait until the plugin is installed.










6. Click the Open Plugin page to start using StarWind SAN & NAS via the vCenter Plugin interface.



Conclusion

By following this guide, StarWind Virtual SAN was deployed and configured in a VMware vSphere environment. As a result, the highly-available datastores were created for storing the virtual machines in VMware vSphere cluster. Also, VMware vSphere plugin was deployed to manage StarWind storage from vSphere Web UI.

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