

StarWind Virtual SAN[®]

Hyperconverged 2-Node Scenario with VMware vSphere 6.0

APRIL 2018

TECHNICAL PAPER



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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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Introduction

Traditionally, VMware vSphere requires a shared storage to ensure data safety, allow virtual machine migration, enable continuous application availability, and eliminate any single point of failure within an IT environment. VMware vSphere users need to choose between two options when selecting the shared storage:

- Hyperconverged solutions, which allow sharing the same hardware resources for the application (i.e., hypervisor, database) and the shared storage, thus decreasing the TCO and achieving the outstanding performance results.
- Compute and Storage separated solutions, which keep the compute and storage layers separate from each other, thus making the maintenance easier, increasing the hardware utilization efficiency, and allowing building the system for the specific purpose

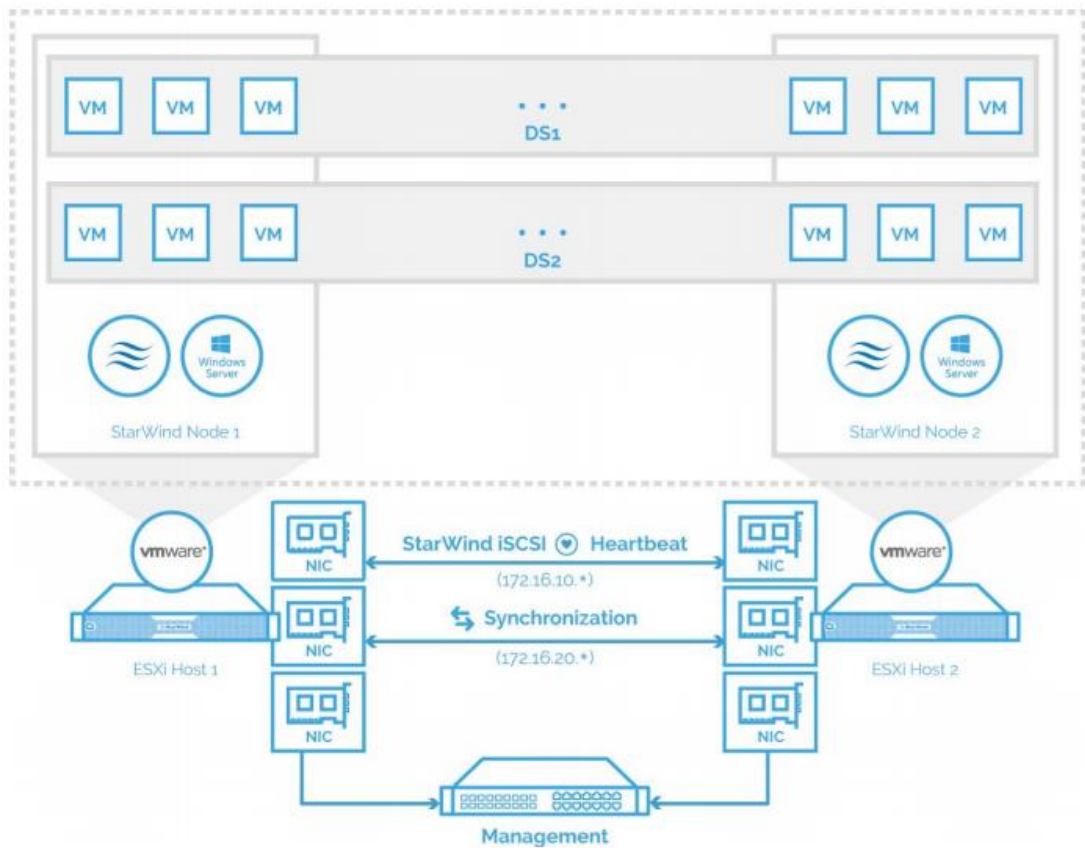
This guide is intended for experienced VMware and Windows system administrators and IT professionals who need to configure **StarWind Virtual SAN®** hyperconverged solution for vSphere deployments. It provides step-by-step guidance on configuring a 2-node vSphere cluster using **StarWind Virtual SAN®** to convert the local storage of the ESXi hosts into a fault-tolerant shared storage resource for ESXi.

A full set of the up-to-date technical documentation can always be found [here](#), or by pressing the **Help** button in the StarWind Management Console.

For any technical inquiries, please, visit our [online community](#), [Frequently Asked Questions](#) page, or use the [support form](#) to contact our technical support department.

Pre-Configuring Servers

The diagram below illustrates the network and storage configuration of the solution described in this guide.

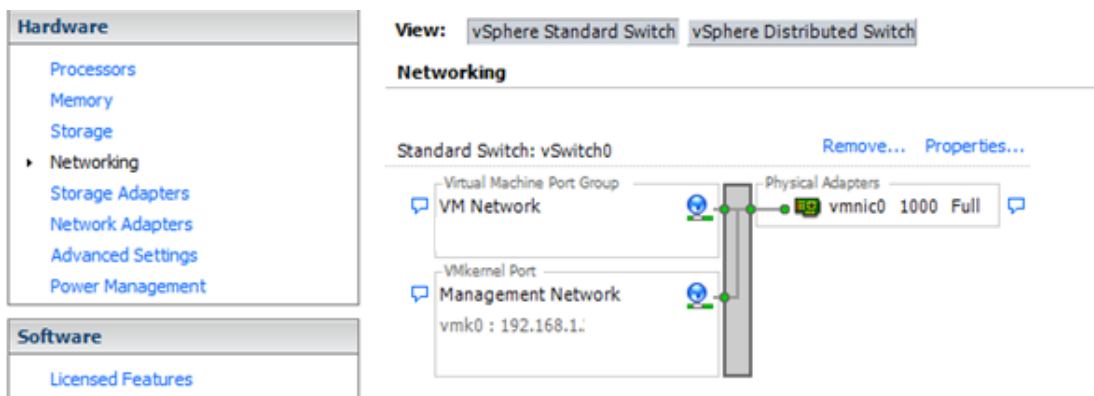


Preparing Hypervisor for StarWind Deployment

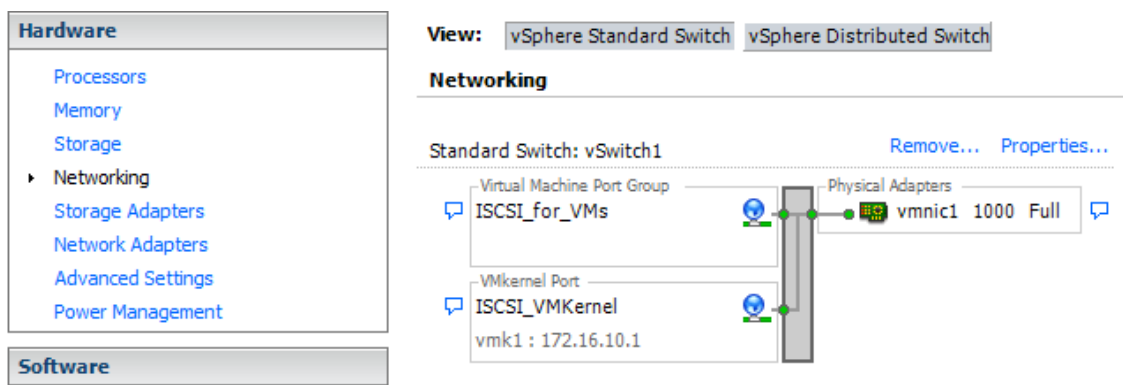
Configuring Networks

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. In this document, 172.16.10.x subnet is used for iSCSI/StarWind heartbeat traffic, while 172.16.20.x one is used for the Synchronization traffic. All actions below should be applied to each ESXi server.

1. Create a vSwitch to use for Management traffic if it is not presented.

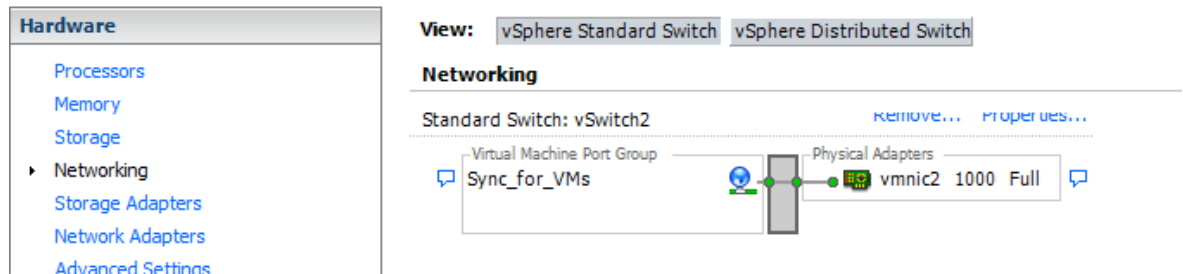


2. Create a vSwitch for the iSCSI/ StarWind Heartbeat channel.



NOTE: A Virtual Machine Port Group should be created for iSCSI/ StarWind Heartbeat and Synchronization vSwitches, while a VMKernel port should be created only for iSCSI traffic. Static IP address should be assigned to VMKernel ports.

3. Create a vSwitch for the Synchronization channel.



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

4. Repeat the steps above for any other links intended for Synchronization and iSCSI/Heartbeat traffic on both ESXi nodes.

Preparing StarWind VMs

5. Create Virtual Machines (VMs) on each Windows Server 2016/2012R2 ESXi host () and install StarWind VSAN.

StarWind VMs on ESXi hosts should be configured with the following settings:

RAM: at least 4 GB (plus the size of the RAM cache if it is going to be used);

CPUs: at least 4 virtual processors with 2 GHz reserved;

Hard disk 1: 100 GB for OS (recommended);

Hard disk 2: Depends on the storage volume intended for the shared storage.

NOTE: Each hard disk should be Thick Provisioned Eager Zeroed.

Network adapter 1: Management

Network adapter 2: iSCSI

Network adapter 3: Sync

NOTE: All network adapters should be VMXNET3.

NOTE: Active Directory Domain Services role can be added on StarWind Virtual Machine (VM) if necessary so that it could serve as a domain controller.

NOTE: When using Star Wind with synchronous replication feature inside of a Virtual Machine, it is recommended not to make backups and snapshots of the Virtual Machine with Star Wind Service which could pause the Star Wind Virtual Machine.

Pausing the Virtual Machines while Star Wind service under load may lead to split-brain issues in devices with synchronous replication and data corruption.

Configuring StarWind VMs startup/shutdown

- Set up the VMs startup policy on both ESXi hosts in **Configuration -> Virtual Machine Startup and Shutdown -> Properties** menu. In the window that pops up, check **Allow virtual machines to start and stop automatically with the system** to enable the option, choose the stop-action as **Guest Shutdown**, and move up the StarWind VMs. Click **Ok** to proceed.

System Settings

Allow virtual machines to start and stop automatically with the system

Default Startup Delay
For each virtual machine, delay startup for:
120 seconds
 Continue immediately if the VMware Tools start

Default Shutdown Delay
For each virtual machine, delay shutdown for:
120 seconds
Shutdown Action: Guest Shutdown

Startup Order
Power on the specified virtual machines when the system starts. During shutdown, they will be stopped in the opposite order.

Order	Virtual Machine	Startup	Startup Delay	Shutdown	Shutdown Delay
Automatic Startup					
1	SW1	Enabled	120 seconds	Shut do...	120 seconds
Any Order					
Manual Startup					

Move Up
Move Down
Edit

System Settings

Allow virtual machines to start and stop automatically with the system

Default Startup Delay
For each virtual machine, delay startup for:
120 seconds
 Continue immediately if the VMware Tools start

Default Shutdown Delay
For each virtual machine, delay shutdown for:
120 seconds
Shutdown Action: Guest Shutdown

Startup Order
Power on the specified virtual machines when the system starts. During shutdown, they will be stopped in the opposite order.

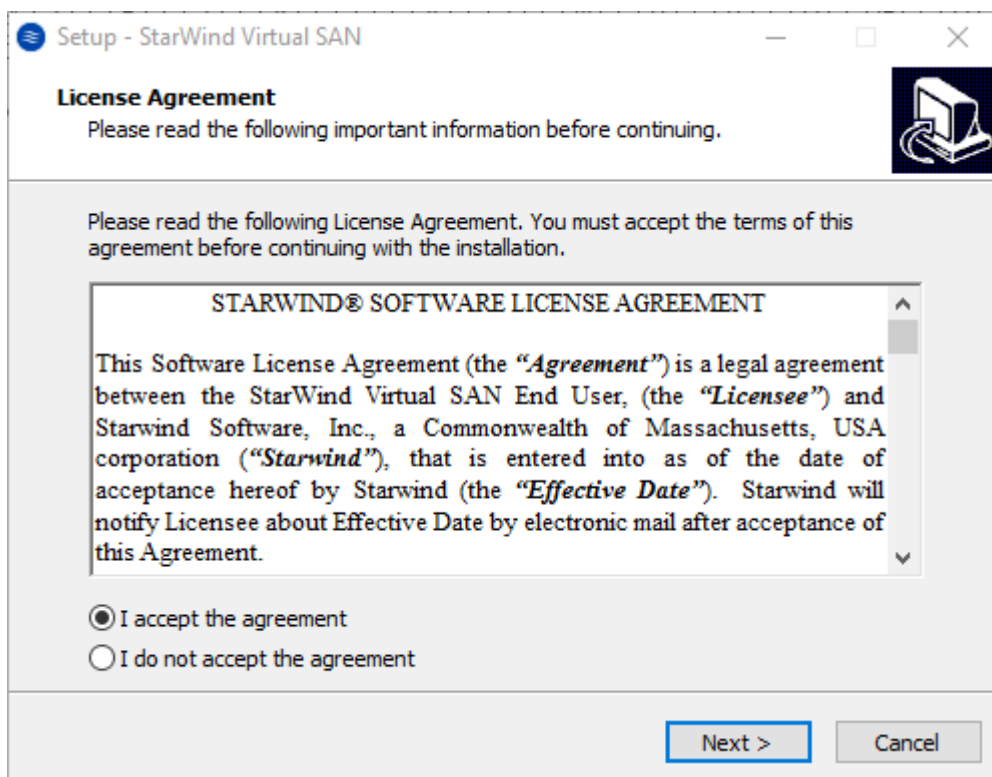
Order	Virtual Machine	Startup	Startup Delay	Shutdown	Shutdown Delay
Automatic Startup					
1	SW2	Enabled	120 seconds	Shut do...	120 seconds
Any Order					
Manual Startup					

Move Up
Move Down
Edit

- Start both StarWind virtual machines, install OS and StarWind Virtual SAN.

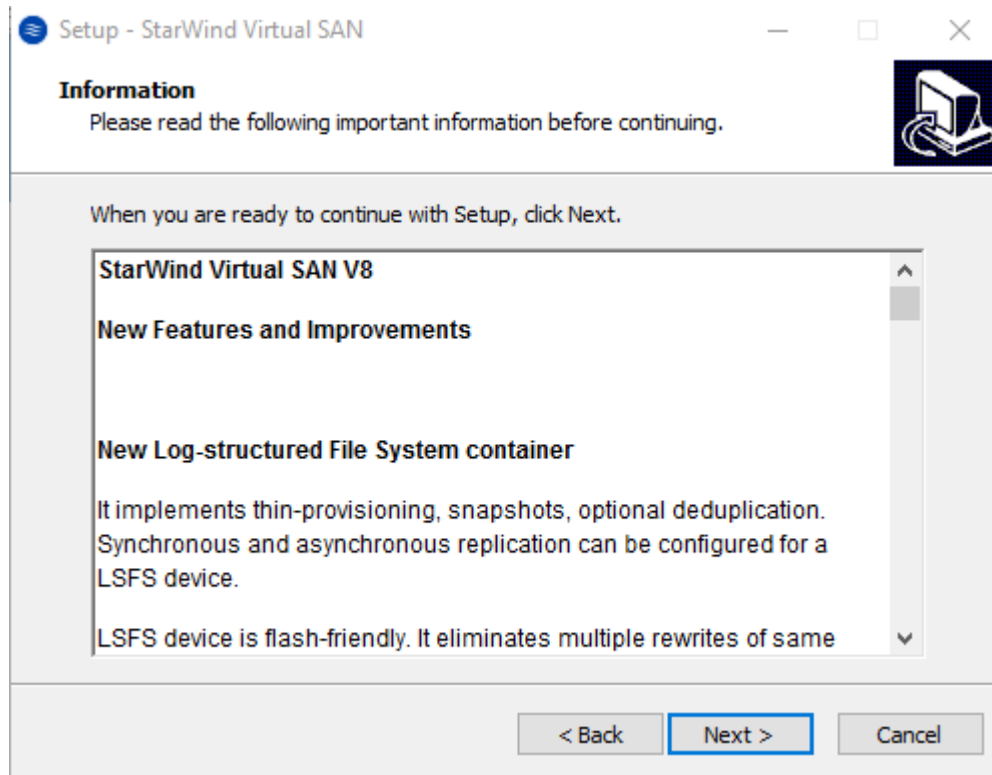
Downloading, Installing and Registering the Software

- Download the StarWind setup executable file from the official website by following the link:
<https://www.starwind.com/registration-starwind-virtual-san>
- Launch the downloaded setup file on the server where **StarWind Virtual SAN** or one of its components is to be installed. The setup wizard appears.
- Read and accept the License Agreement.



Click **Next** to continue.

11. Read the information about the new features and improvements carefully. Red text indicates warnings for users who are updating their existing software installations.



Click **Next** to continue.

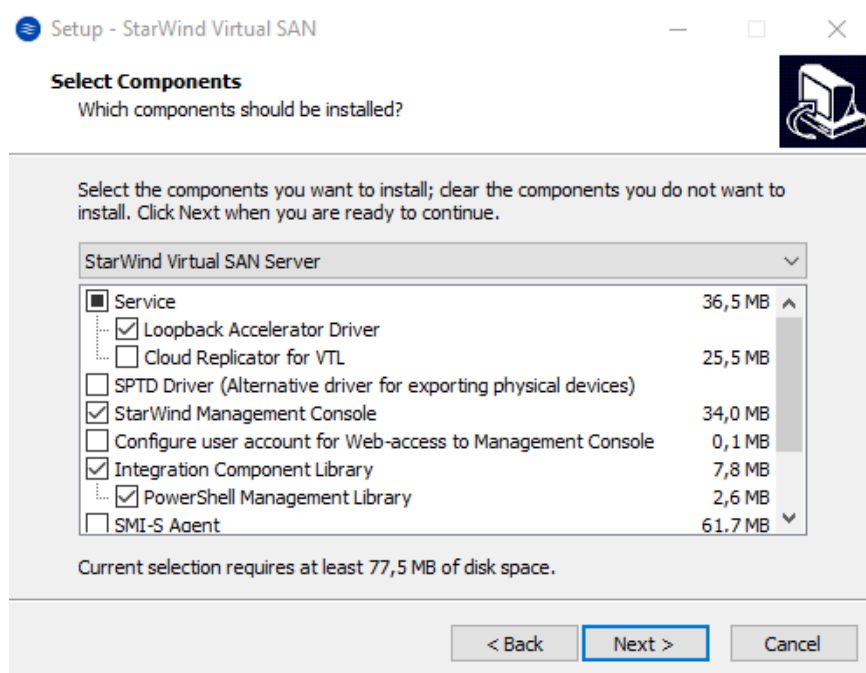
12. Select the following components for the minimum setup:

- **StarWind Virtual SAN Service**

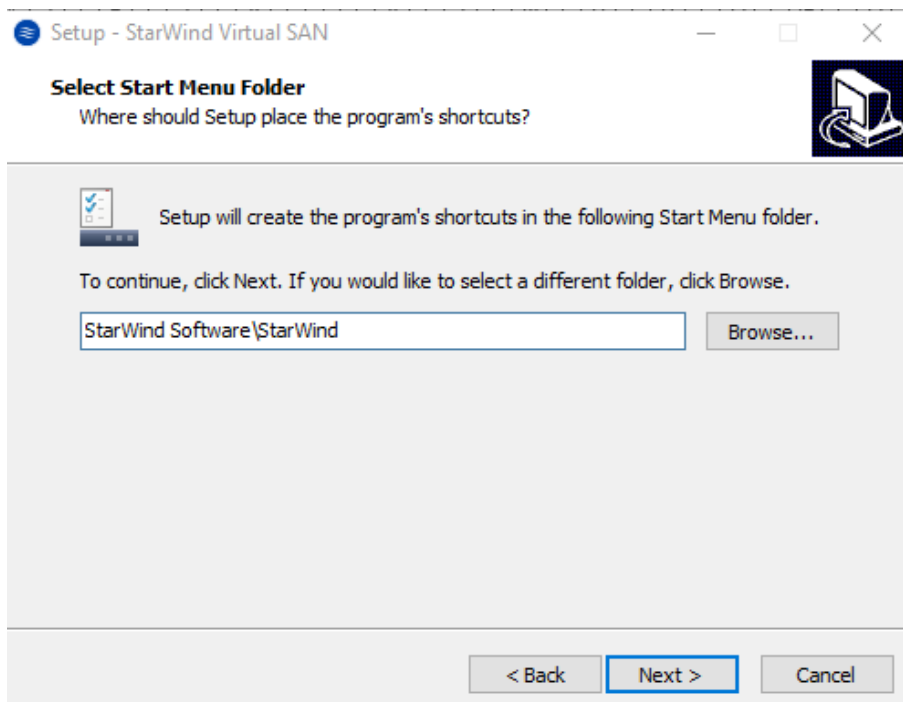
StarWind VSAN service is the “core” of the software. It allows creating iSCSI targets and sharing virtual and physical devices. The service can be managed via StarWind Management Console on any Windows computer or VSA connected to the network. Alternatively, the service can be managed from StarWind Web Console which is deployed separately.

- **StarWind Management Console**

[StarWind Management Console](#) is the Graphic User Interface (GUI) part of the software that controls and monitors all storage-related operations (e.g., allows users to create targets and devices on StarWind Virtual SAN servers connected to the network).

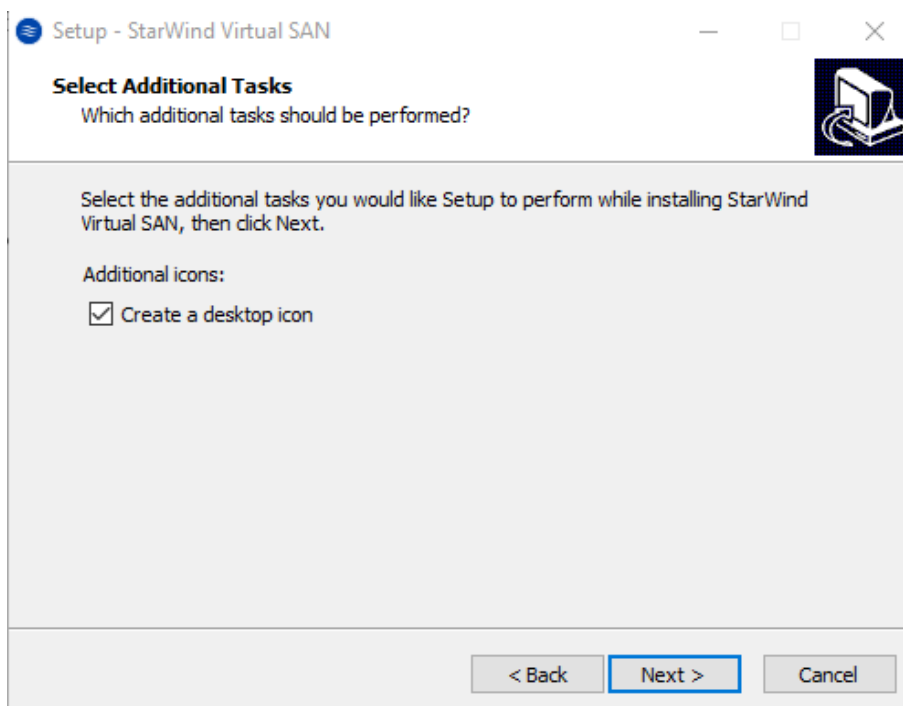


13. Specify **Start Menu Folder**.

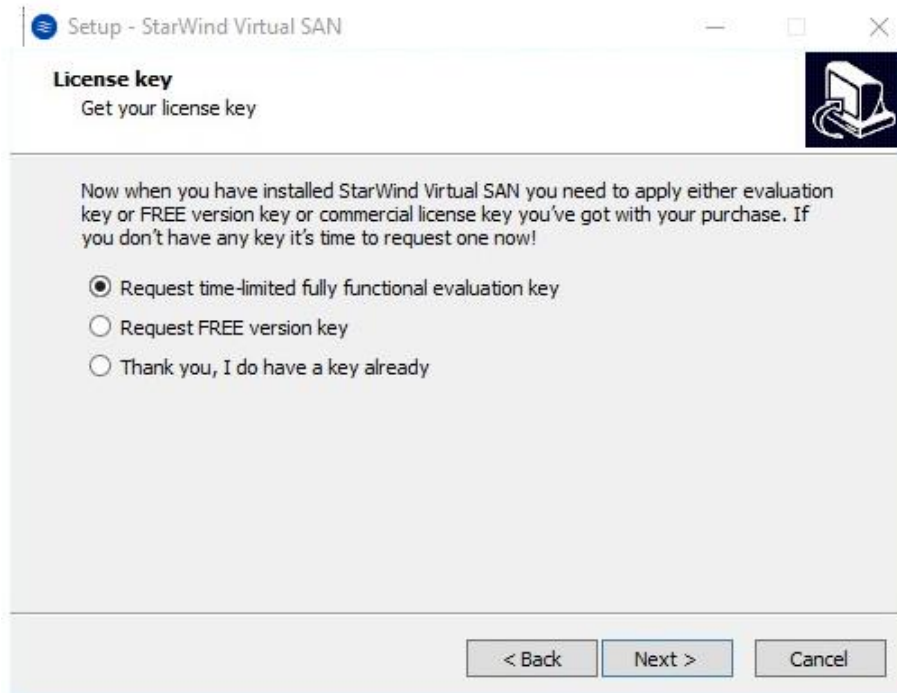


Click **Next** to continue.

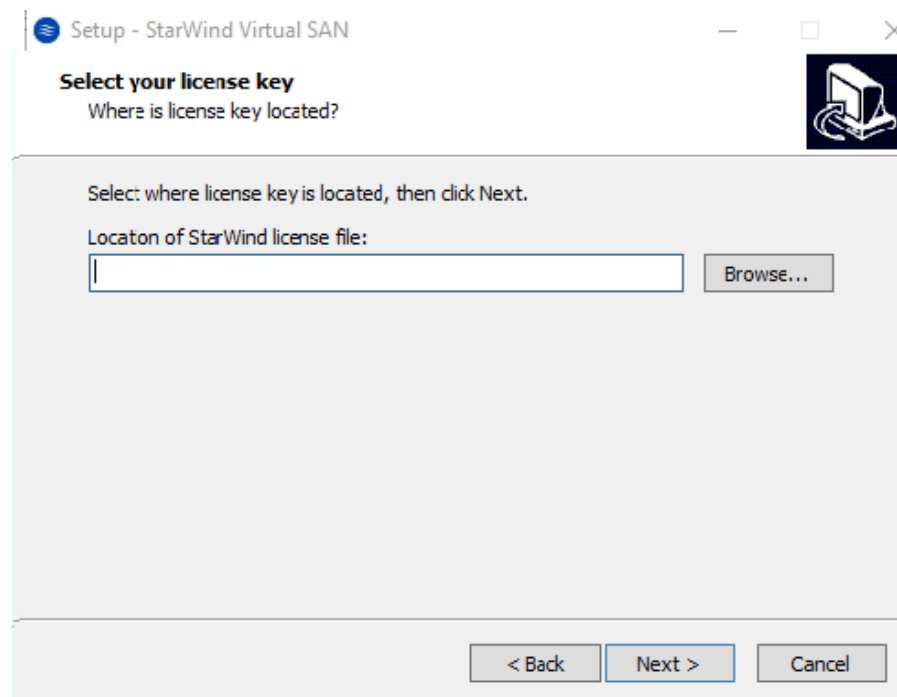
14. Tick the checkbox if a desktop icon is needed.



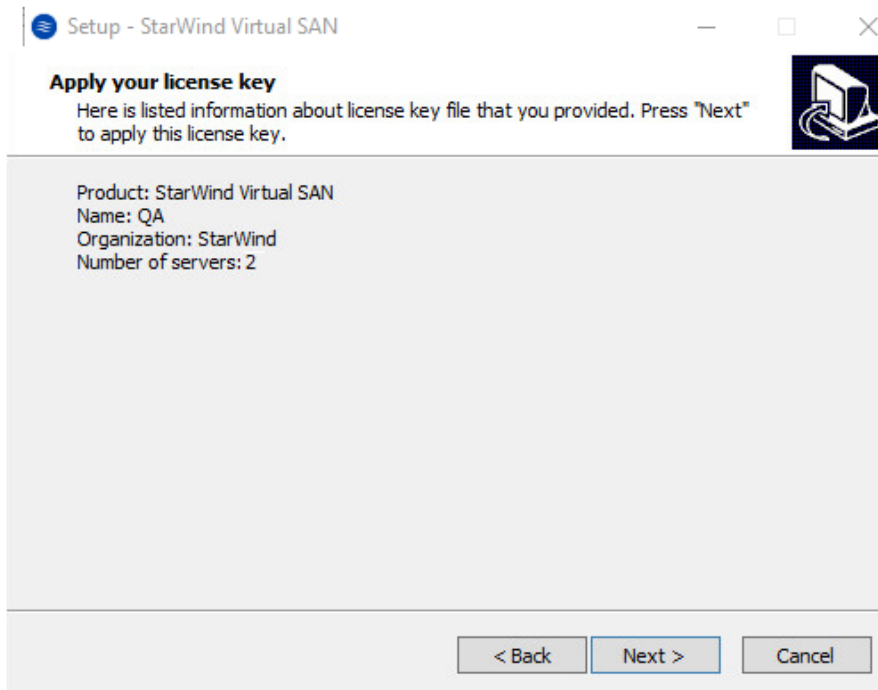
- The prompt that appears allows requesting a time-limited fully functional evaluation key or a FREE version key. Alternatively, use the already purchased **StarWind Virtual SAN** commercial license key. Select the corresponding option.



- Click **Browse** to choose the license file.

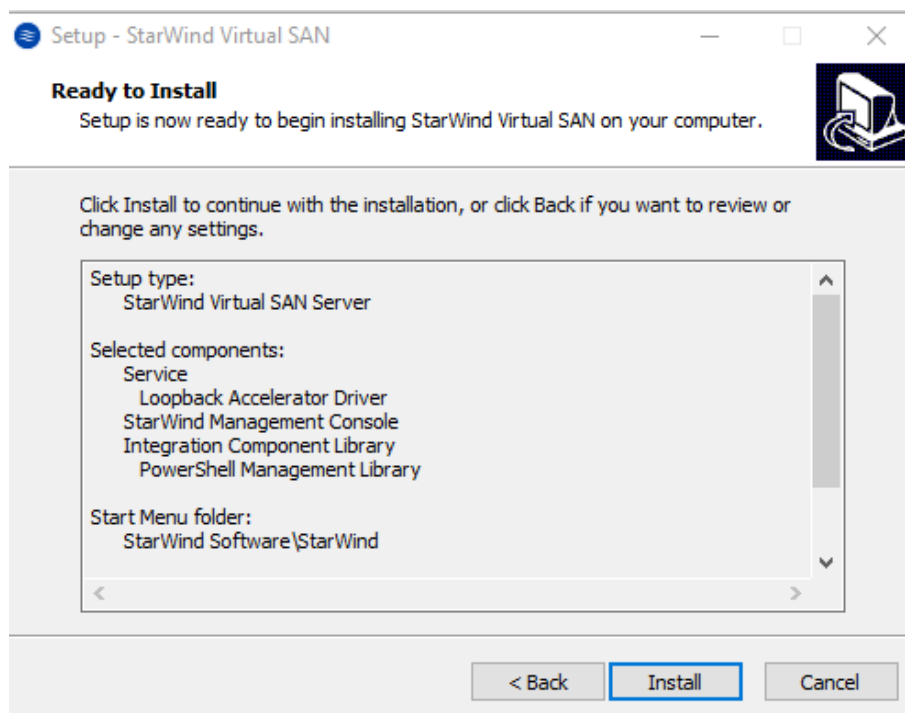


17. Verify the licensing information.

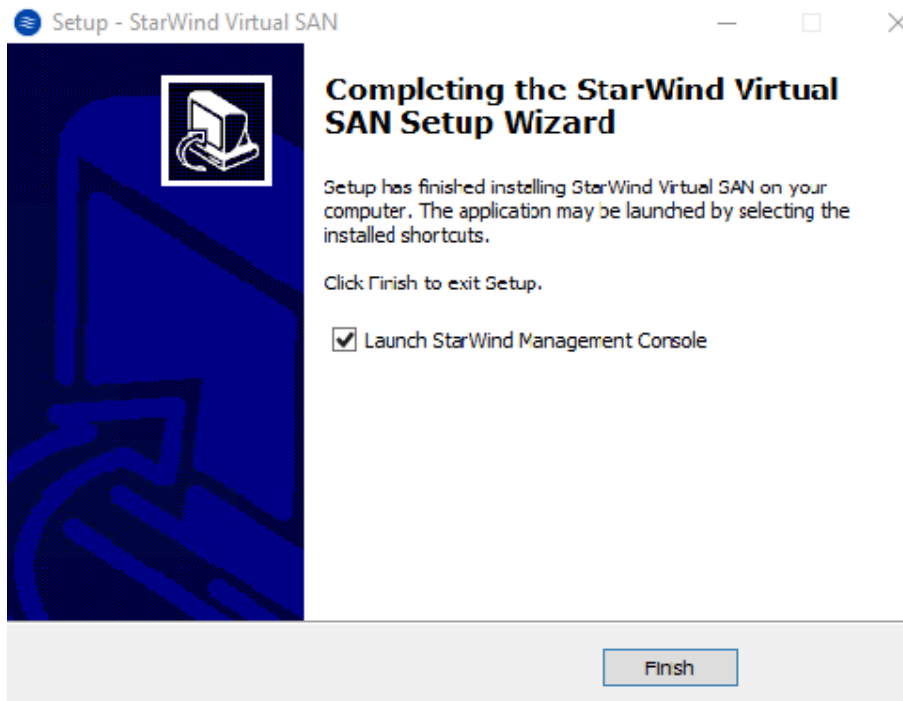


Click **Next** to apply the license key.

18. Verify the installation settings. Click **Back** to make any changes or **Install** to continue.



19. Click **Finish** to complete the installation process. Optionally, StarWind Management Console can be launched by ticking the corresponding checkbox.



20. Repeat the steps above on the second virtual machine.

Configuring Automatic storage rescan

For each ESXi host, configure the automatic storage rescan.

Log in to StarWind VM and install vSphere PowerCLI on each StarWind virtual machine by adding the PowerShell module (Internet connectivity is required). To do so, run the following PowerShell command:

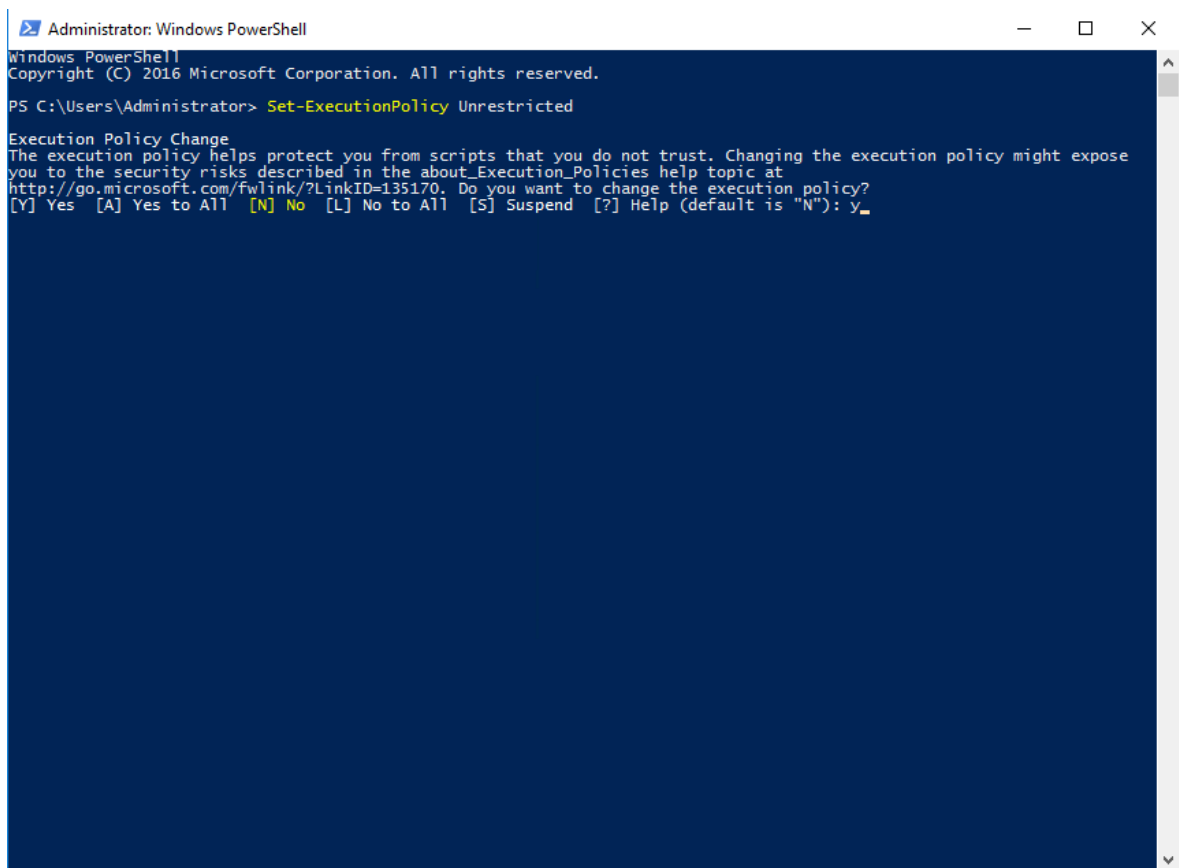
Install-Module -Name VMware.PowerCLI -AllowClobber

NOTE: In case of using Windows Server 2012 R2, online PowerCLI installation requires Windows Management Framework 5.1 or later installed on VMs. Windows Management Framework 5.1 can be downloaded by following the link:

<https://go.microsoft.com/fwlink/?linkid=839516>

21. Open PowerShell and change the Execution Policy to **Unrestricted** by running the following command:

Set-ExecutionPolicy Unrestricted

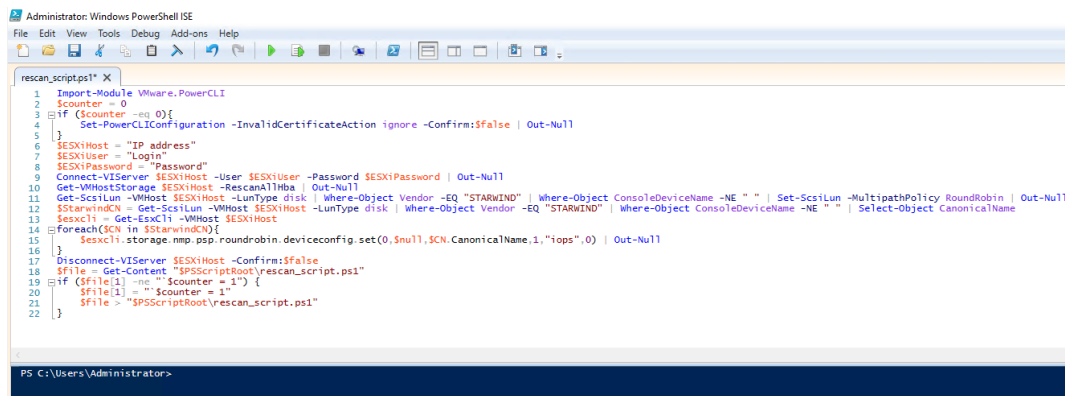


```
Administrator: Windows PowerShell
Windows PowerShell
Copyright (C) 2016 Microsoft Corporation. All rights reserved.

PS C:\Users\Administrator> Set-ExecutionPolicy Unrestricted

Execution Policy Change
The execution policy helps protect you from scripts that you do not trust. Changing the execution policy might expose you to the security risks described in the about_Execution_Policies help topic at
http://go.microsoft.com/fwlink/?LinkID=135170. Do you want to change the execution policy?
[Y] Yes [A] Yes to All [N] No [L] No to All [S] Suspend [?] Help (default is "N"): y
```

22. Create PowerShell script which will perform an HBA rescan on the hypervisor host.



Import-Module VMware.PowerCLI

\$counter = 0

if (\$counter -eq 0){

Set-PowerCLIConfiguration -InvalidCertificateAction ignore -Confirm:\$false | Out-Null

}

\$ESXiHost = "IP address"

\$ESXiUser = "Login"

\$ESXiPassword = "Password"

Connect-VIServer \$ESXiHost -User \$ESXiUser -Password \$ESXiPassword | Out-Null

Get-VMHostStorage \$ESXiHost -RescanAllHba | Out-Null

Get-ScsiLun -VMHost \$ESXiHost -LunType disk | Where-Object Vendor -EQ "STARWIND" |

Where-Object ConsoleDeviceName -NE " " | Set-ScsiLun -MultipathPolicy RoundRobin | Out-Null

\$StarwindCN = Get-ScsiLun -VMHost \$ESXiHost -LunType disk |

Where-Object Vendor -EQ "STARWIND" | Where-Object ConsoleDeviceName -NE " " |

Select-Object CanonicalName

\$esxcli = Get-EsxCLI -VMHost \$ESXiHost

foreach(\$CN in \$StarwindCN){

\$esxcli.storage.nmp.psp.roundrobin.deviceconfig.set(0,\$null,\$CN.CanonicalName,1,"iops",0) |

Out-Null

}

Disconnect-VIServer \$ESXiHost -Confirm:\$false

\$file = Get-Content "\$PSScriptRoot\rescan_script.ps1"

if (\$file[1] -ne "`\$counter = 1") {

\$file[1] = "`\$counter = 1"

\$file > "\$PSScriptRoot\rescan_script.ps1"

}

In the corresponding lines, specify the IP address and login credentials of the ESXi host on which the current StarWind VM is stored and running:

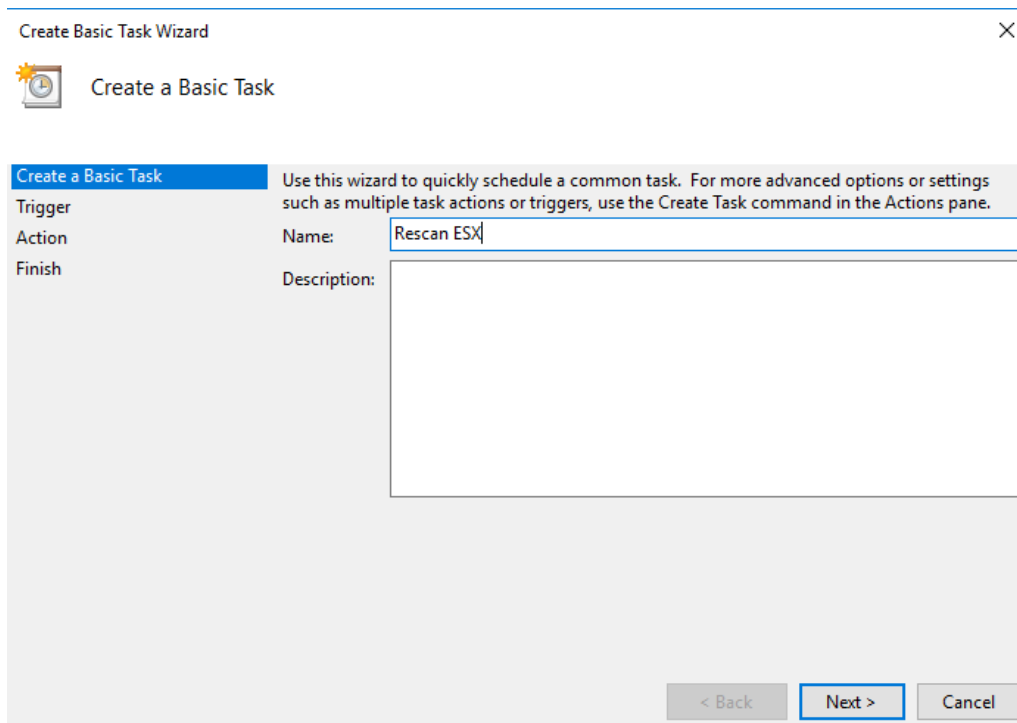
\$ESXiHost1 = "IP address"

\$ESXiUser = "Login"

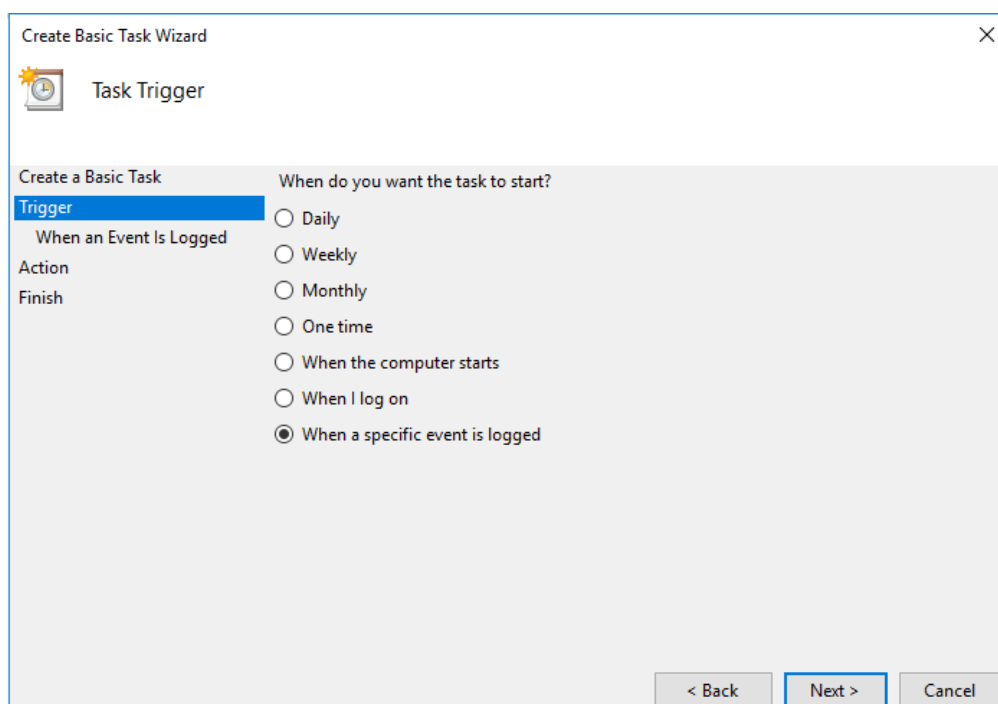
\$ESXiPassword = "Password"

Save the script as rescan_script.ps1 to the root of the C:\ drive of the VM.

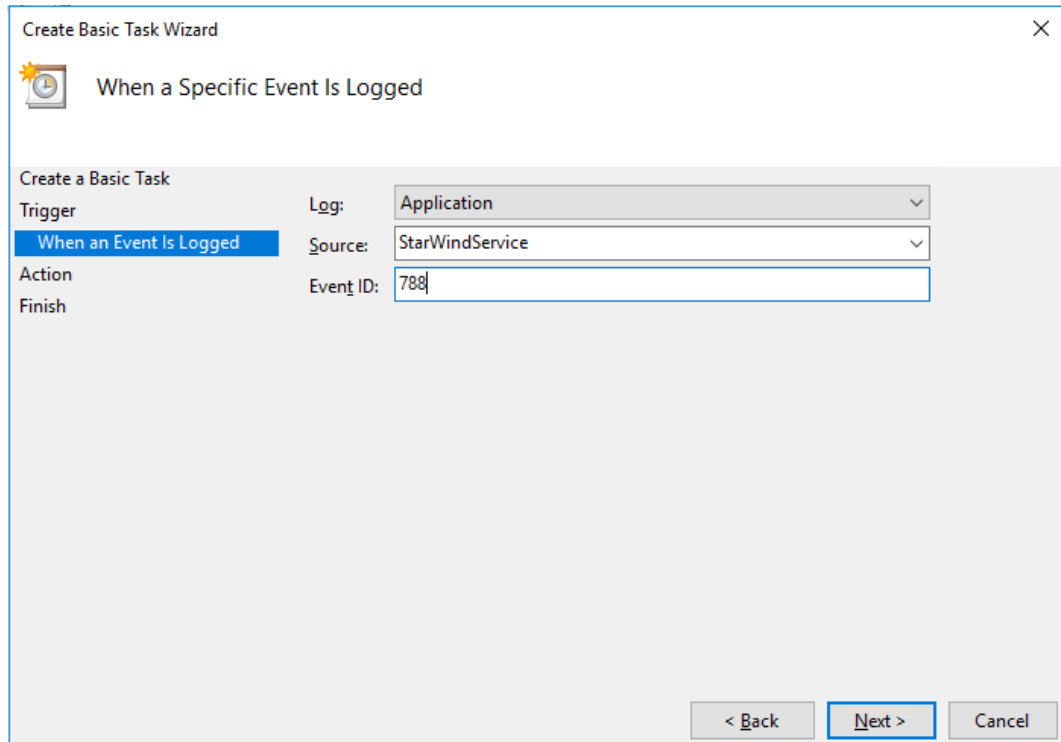
23. Perform the configuration steps above on the partner node.
24. Go to **Control Panel -> Administrative Tools -> Task Scheduler -> Create Basic Task** and follow the wizard steps:



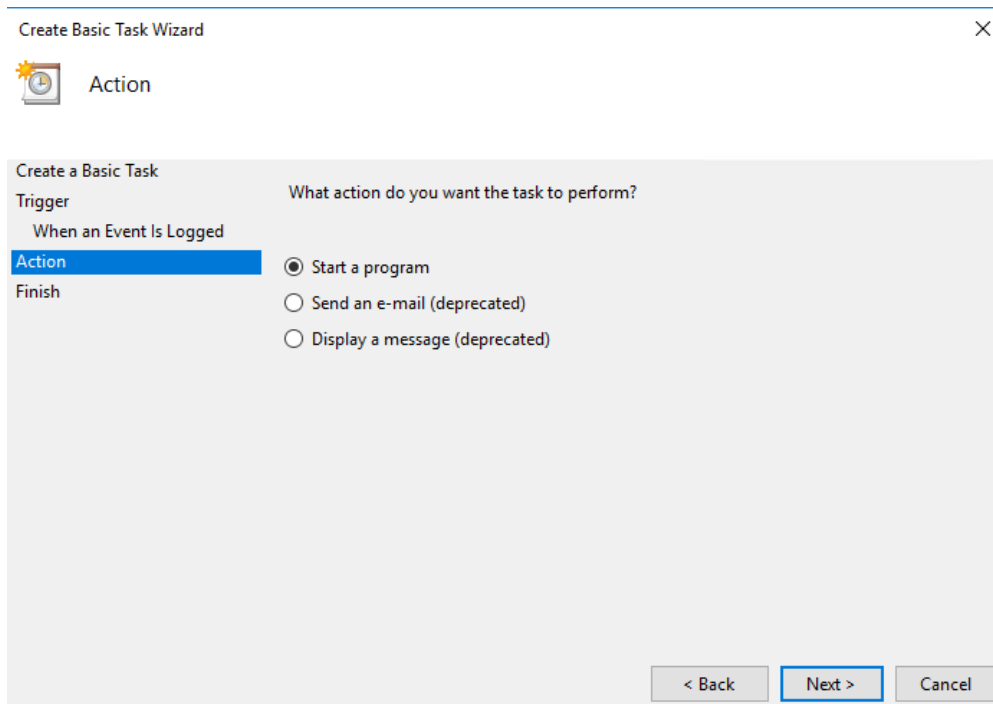
25. Specify the task name, select **When a specific event is logged**, and click **Next**.



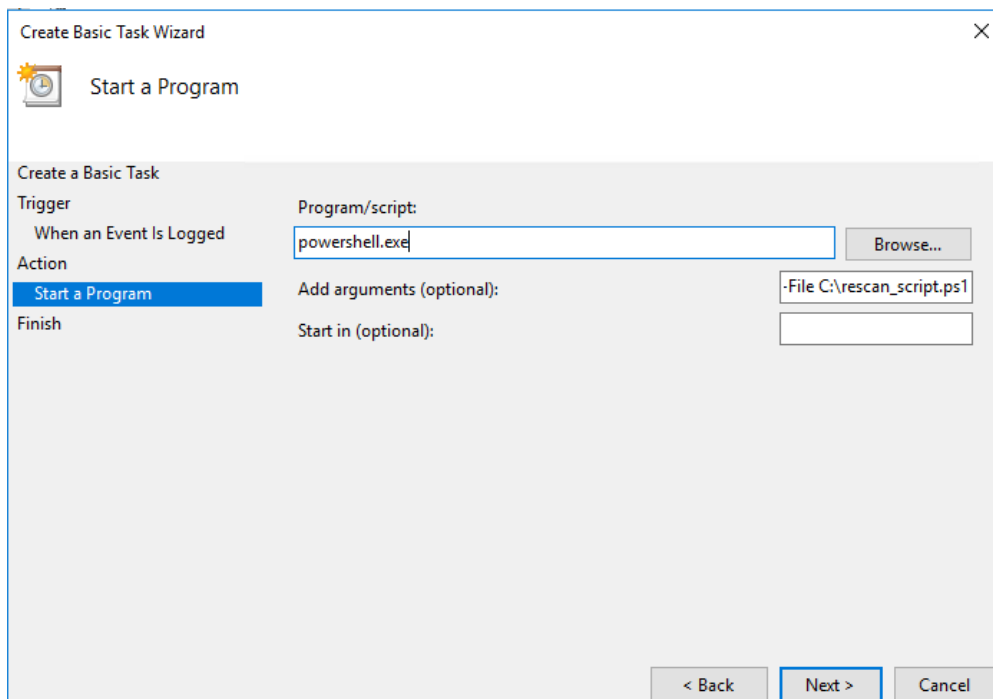
26. Select **Application** in the Log dropdown menu, type **StarWindService** as the event source and **788** as the event ID. Click the **Next** button.



27. Choose **Start a Program** as an action the task should perform and click **Next**.

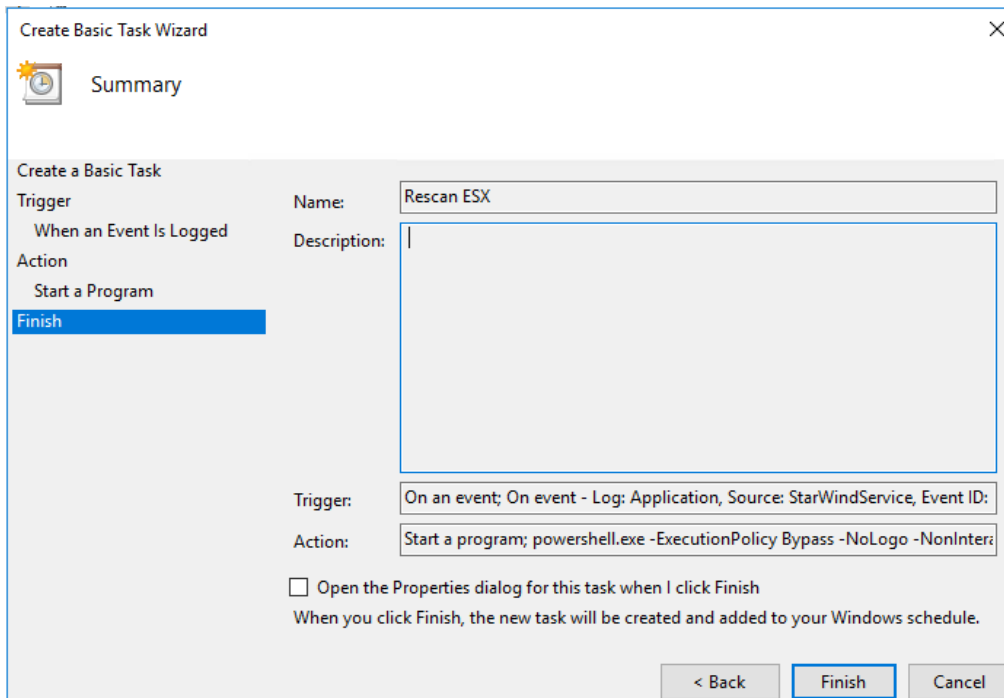


28. Type **powershell.exe** in the **Program/script** field. In the **Add arguments** field, type: `"-ExecutionPolicy Bypass -NoLogo -NonInteractive -NoProfile -WindowStyle Hidden -File C:\rescan_script.ps1 "`

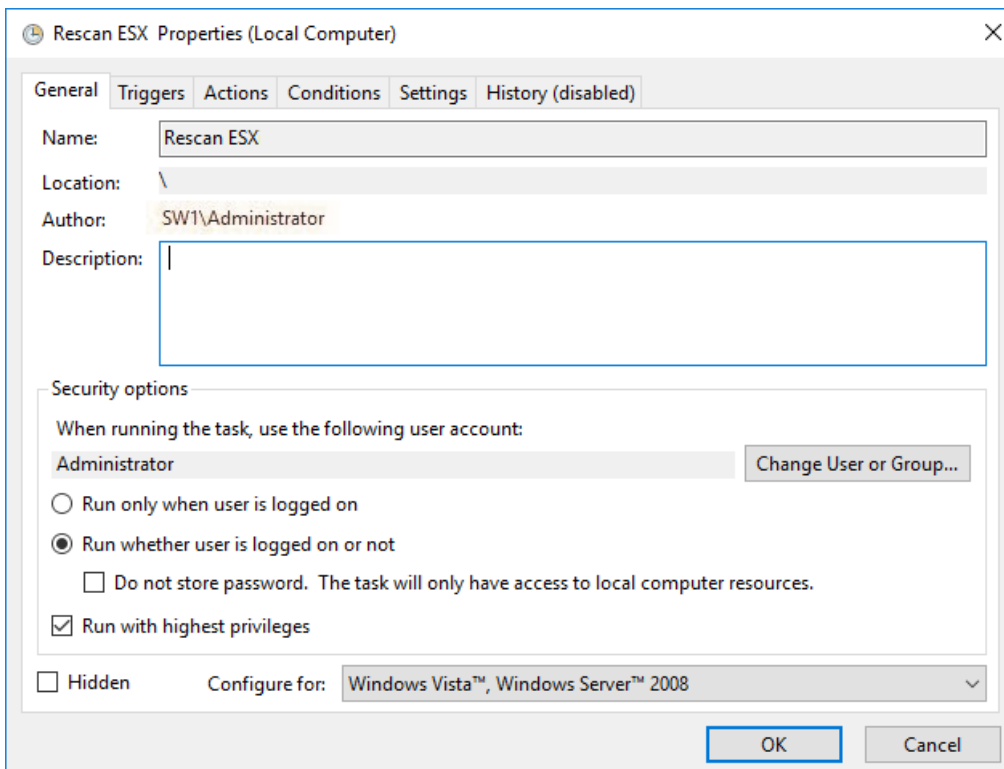


Click the **Next** button to continue.

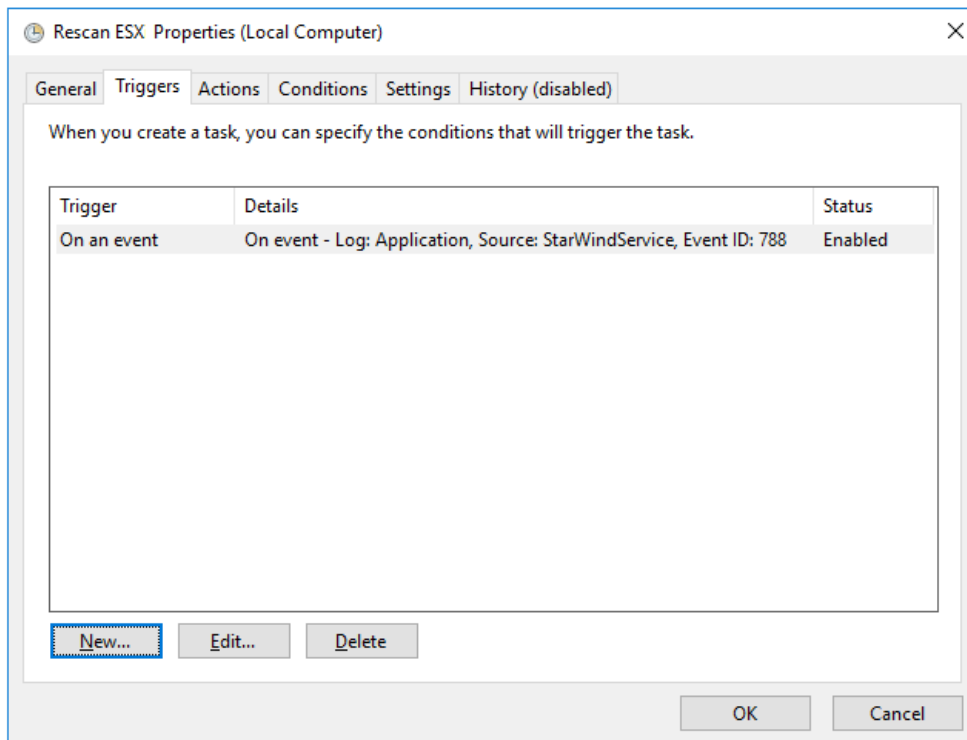
29. Click **Finish** to exit the wizard.



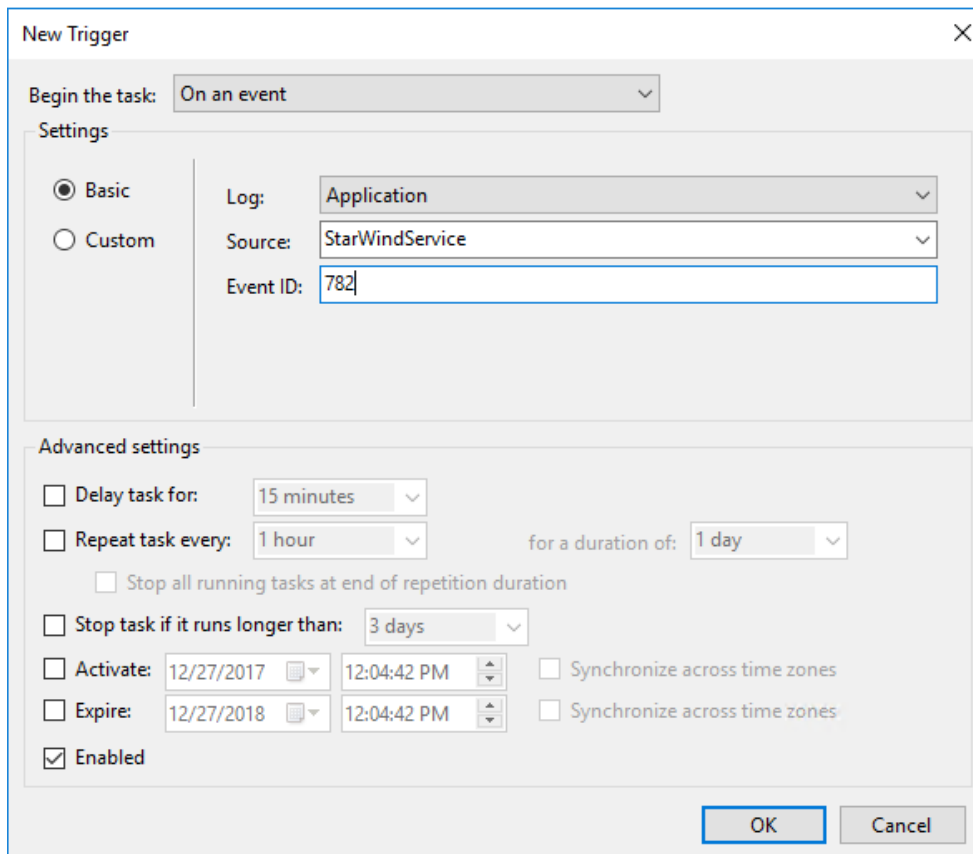
30. Configure the task to run with the highest privileges by ticking the corresponding checkbox in the window. Make sure that the **“Run whether user is logged on or not”** option is selected.



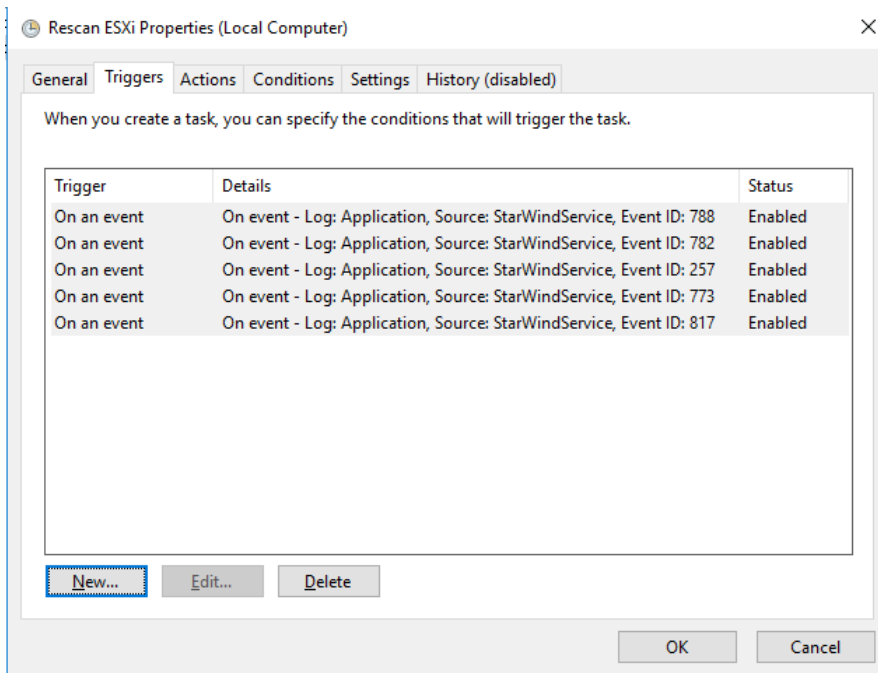
31. Switch to the **Triggers** tab. Verify that the trigger on event 788 is set up correctly.



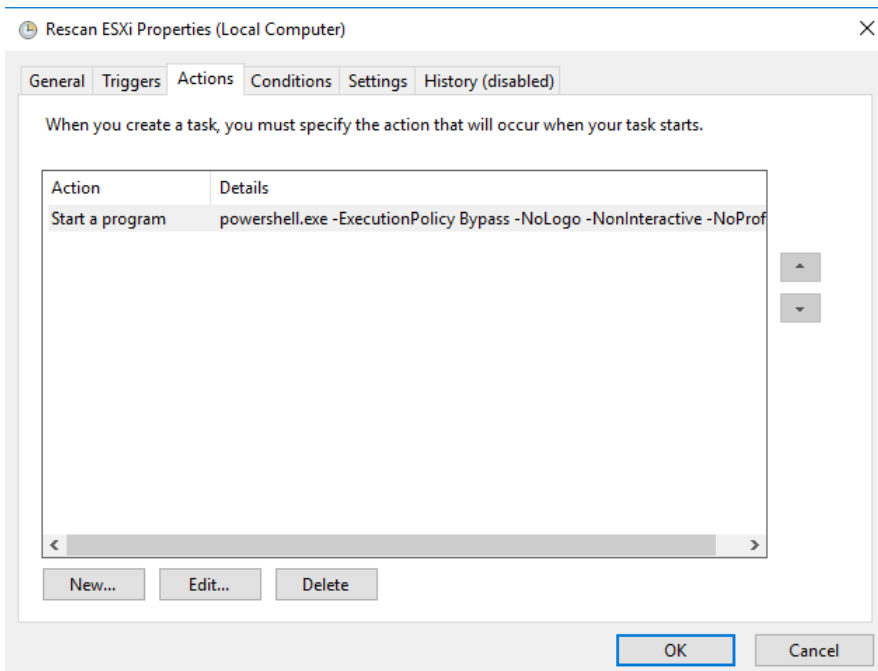
32. Click **New** and add other triggers by Event ID **782, 257, 773,** and **817**.



33. All added triggers should look like in the screenshot below.



34. Switch to the **Actions** tab and verify the parameters for the task.



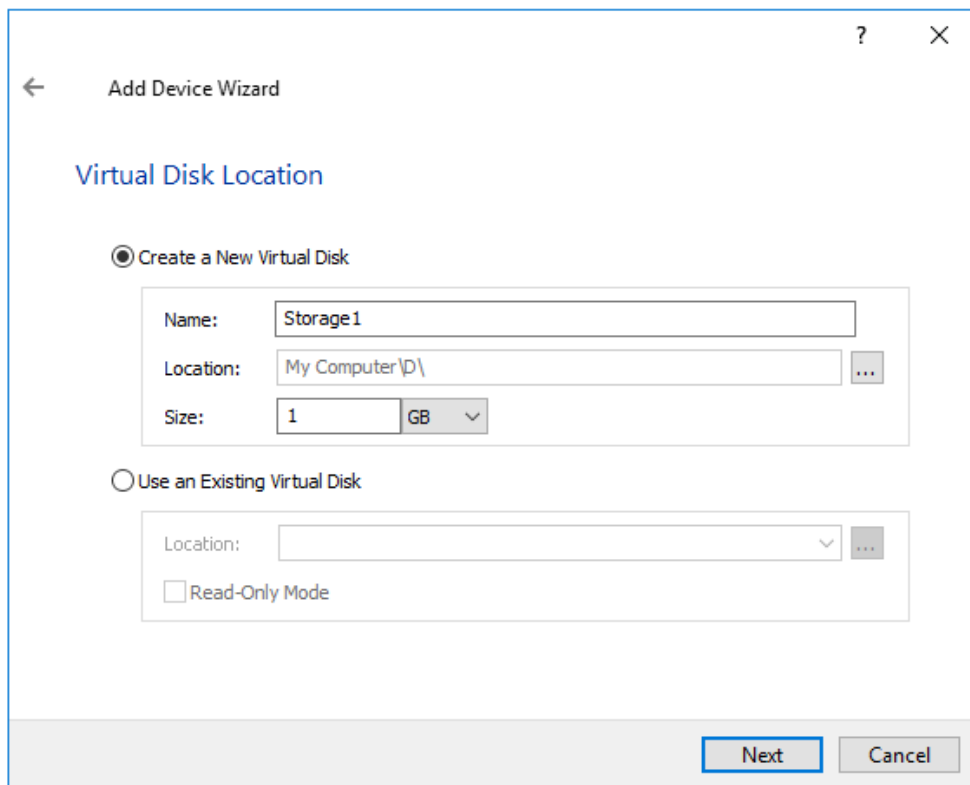
Press **OK** and type the credentials for the user whose rights are used to execute the command in the prompt.

35. Perform the same steps on the second StarWind VM, specifying the corresponding settings.

Provisioning Storage with StarWind VSAN

Creating StarWind HA devices (DS1, DS2)

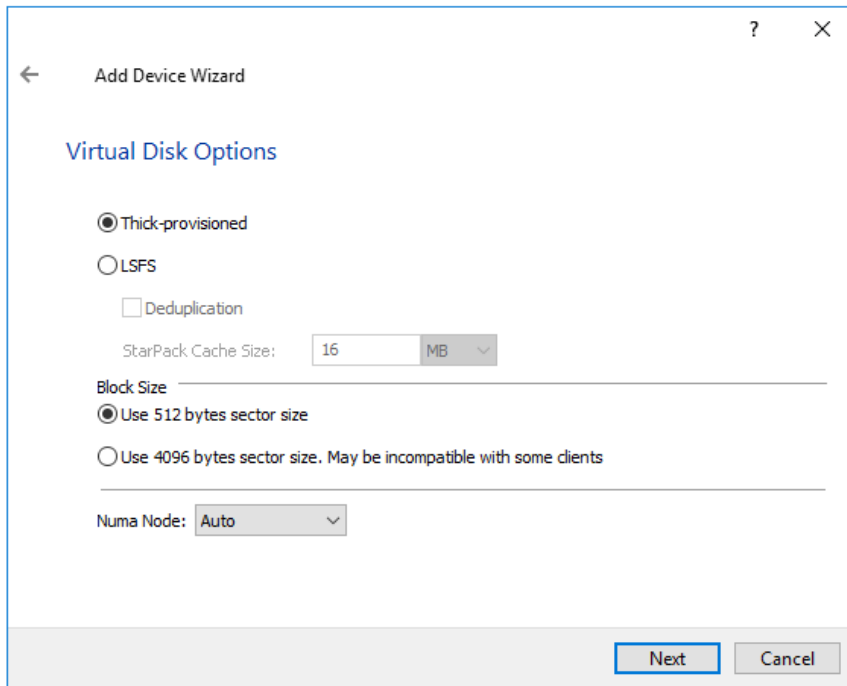
36. Open [StarWind Management Console](#) and click the **Add Device (advanced)** button.
37. Select **Hard disk device** as the type of the created device. Click **Next** to continue.
38. Select **Virtual disk**. Click **Next** to continue.
39. Specify **Virtual Disk Location** and **Size**.



The screenshot shows the 'Add Device Wizard' dialog box, specifically the 'Virtual Disk Location' step. The dialog has a title bar with a question mark and a close button. A back arrow is visible in the top left corner. The main title is 'Add Device Wizard'. Below it, the section is titled 'Virtual Disk Location'. There are two radio button options: 'Create a New Virtual Disk' (which is selected) and 'Use an Existing Virtual Disk'. Under 'Create a New Virtual Disk', there are three input fields: 'Name' with the value 'Storage1', 'Location' with the value 'My Computer\D\' and a browse button (...), and 'Size' with the value '1' and a unit dropdown menu set to 'GB'. Under 'Use an Existing Virtual Disk', there is a 'Location' dropdown menu with a browse button (...). At the bottom, there is a 'Read-Only Mode' checkbox which is unchecked. At the bottom right, there are 'Next' and 'Cancel' buttons.

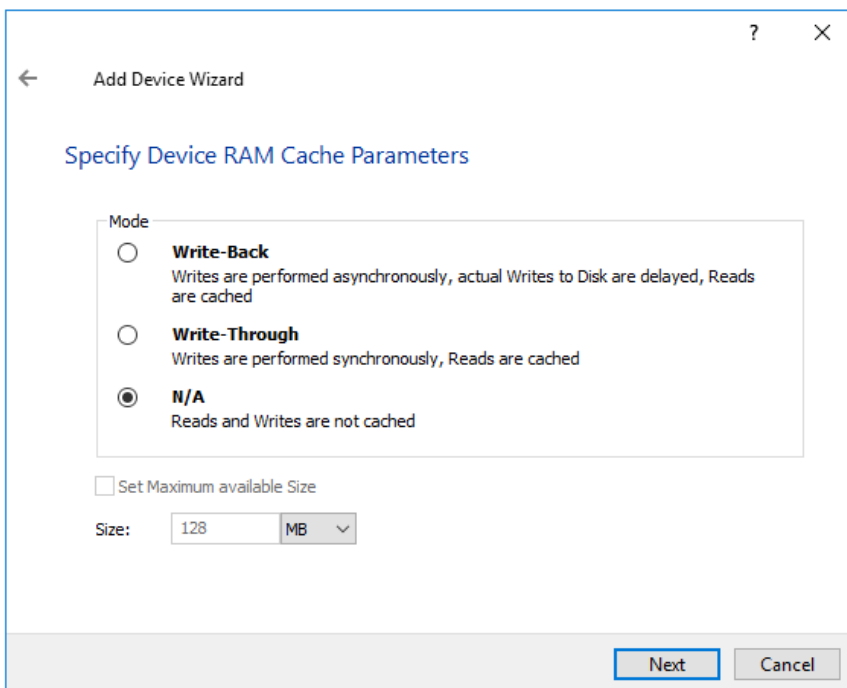
Click **Next**.

40. Specify **Virtual Disk Options** and click **Next** to continue.



NOTE: For ESXi, use 512 bytes **Block Size**

41. Define the RAM caching policy and specify the cache size (in corresponding units) and click **Next** to continue.



NOTE: The recommended RAM cache size is 1 GB per 1 TB of storage.

42. Define the flash caching policy and the cache size. Click **Next** to continue.

The screenshot shows the 'Add Device Wizard' dialog box with the title 'Add Device Wizard'. The main heading is 'Specify Flash Cache Parameters'. There are two radio button options: 'No Flash Cache' (selected) and 'Use Flash Cache'. Below these are three input fields: 'Name' with the value 'Flash-Storage 1', 'Location' with the value 'My Computer\D\' and a browse button (...), and 'Size' with the value '1' and a unit dropdown menu set to 'GB'. At the bottom right, there are 'Next' and 'Cancel' buttons.

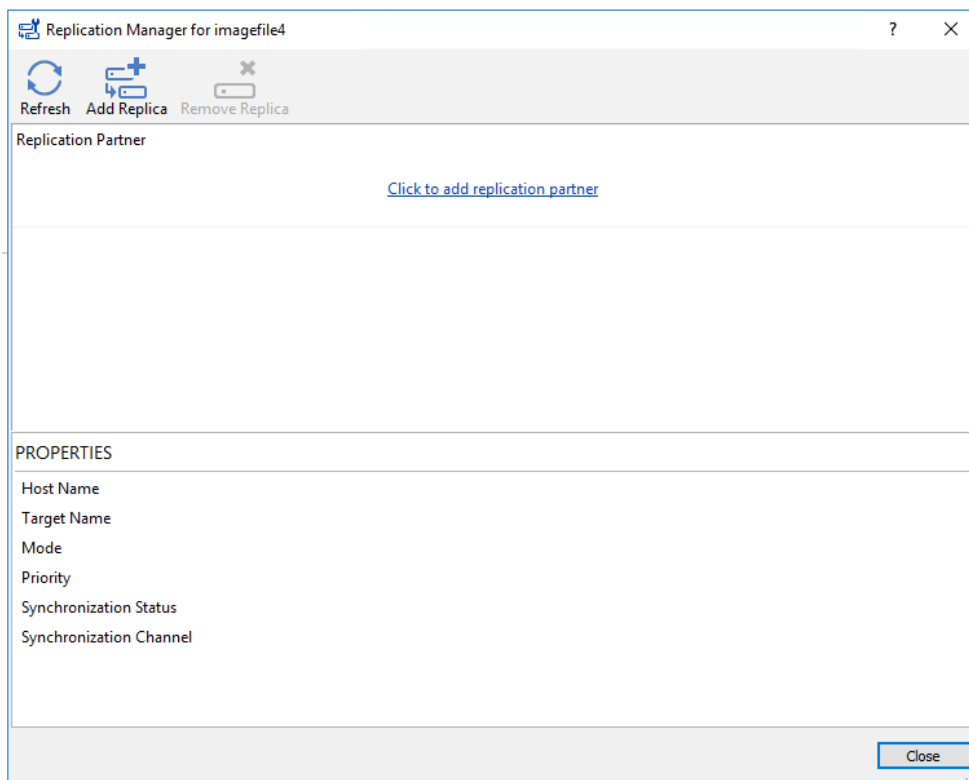
NOTE: The recommended flash cache size is 10% of the created device size.

43. Specify the target parameters. Select the **Target Name** checkbox to enter a custom target name if required. Otherwise, the name will be generated automatically in accordance with the specified target alias.

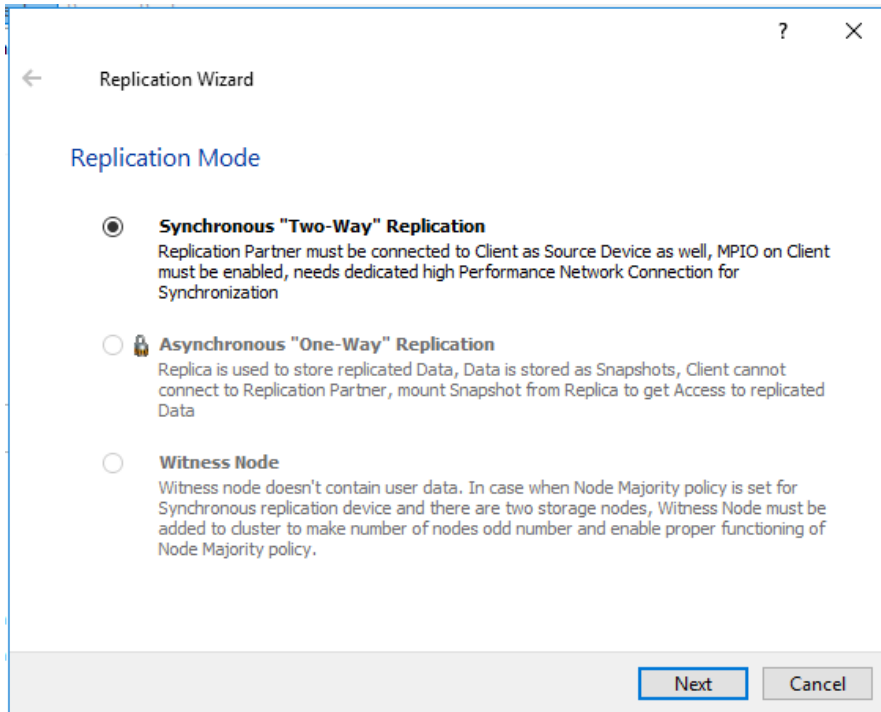
The screenshot shows the 'Add Device Wizard' dialog box with the title 'Add Device Wizard'. The main heading is 'Target Parameters'. There is a dropdown menu for 'Choose a Target Attachment Method' with the selected option 'Create new Target'. Below it is a text box for 'Target Alias' with the value 'Storage1'. There is a checkbox for 'Target Name' which is currently unchecked, and a text box below it containing the value 'iqn.2008-08.com.starwindsoftware:sw-hca-01-storage1'. At the bottom, there is a checked checkbox for 'Allow multiple concurrent iSCSI Connections'. At the bottom right, there are 'Next' and 'Cancel' buttons.

Click **Next** to continue.

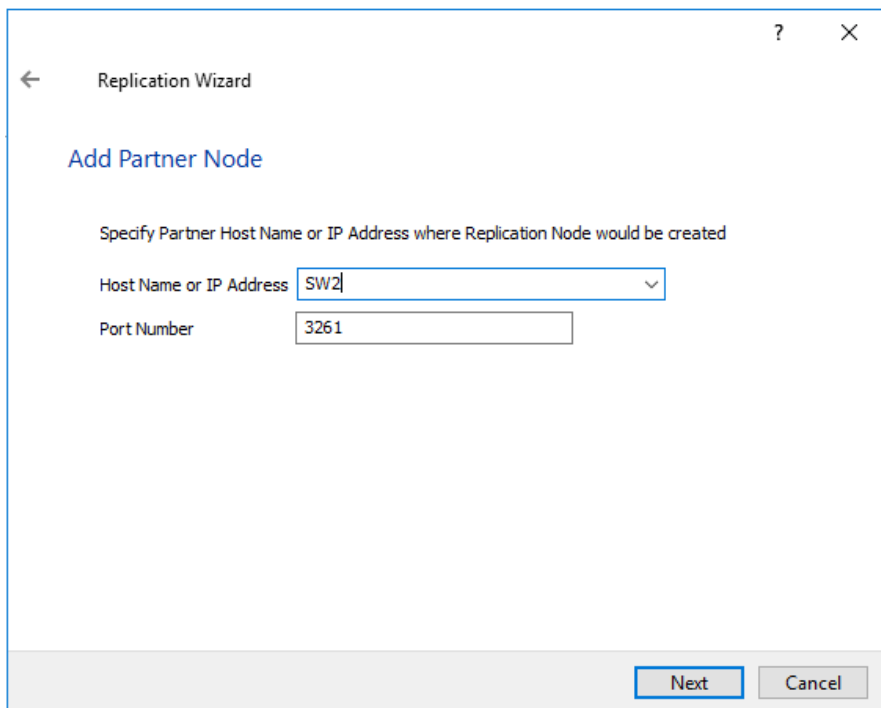
44. Click **Create** to add a new device and attach it to the target.
45. Click **Finish** to close the wizard.
46. Right-click the recently created device and select **Replication Manager** from the shortcut menu.
47. Click **Add replica**.



48. Select **Synchronous two-way replication** as a replication mode and click **Next** to proceed.

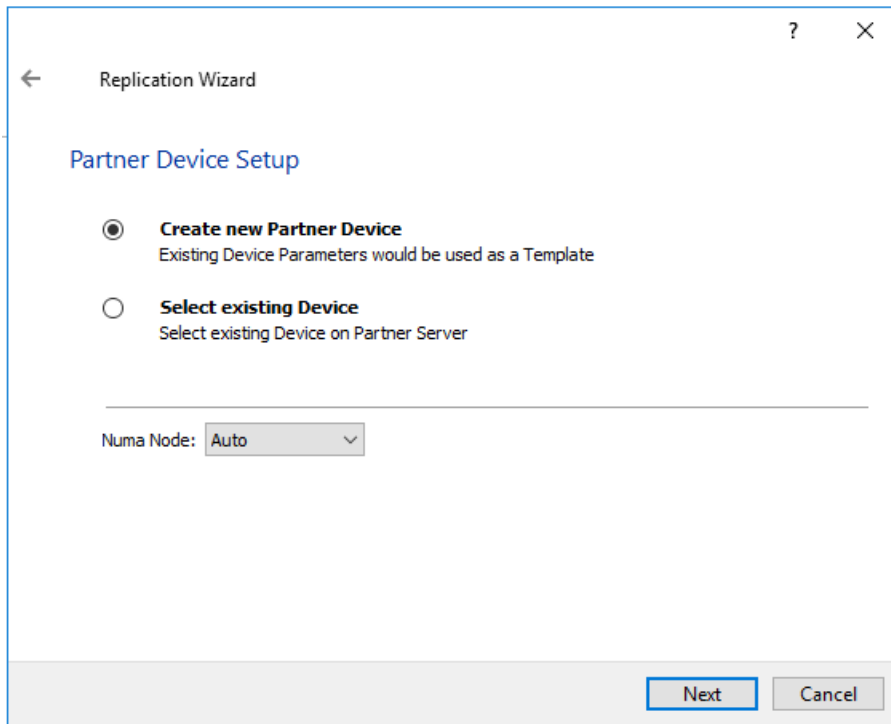


49. Specify Partner Host Name, IP Address, and Port Number.

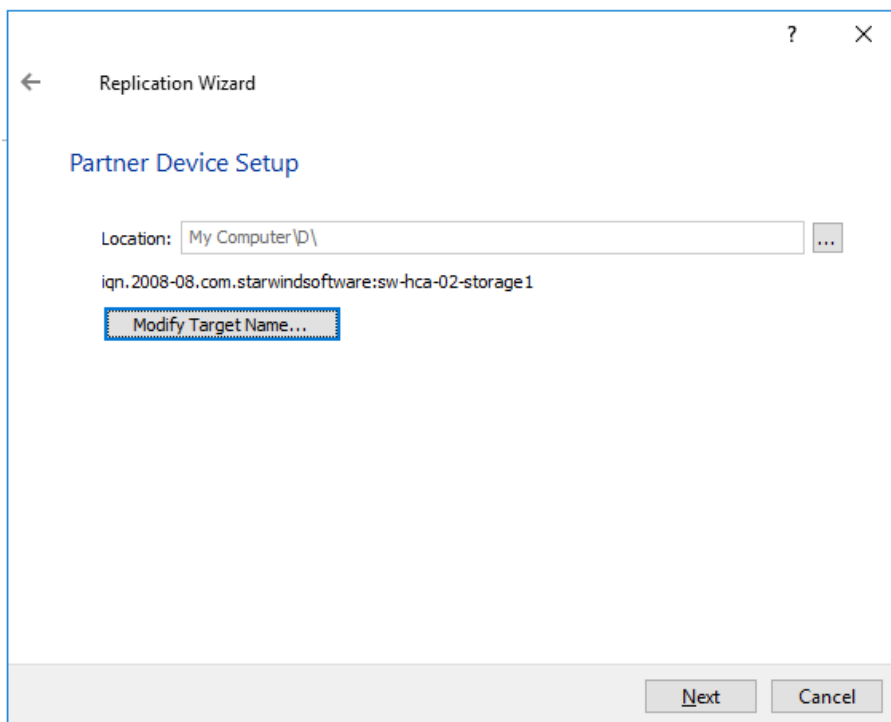


Click **Next**.

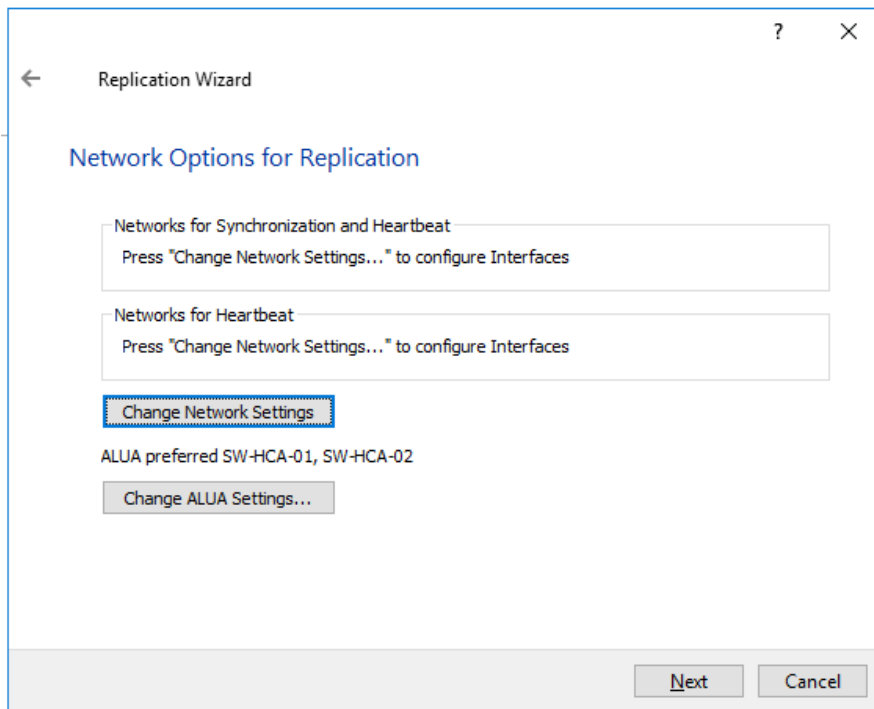
50. Choose **Create new Partner Device** and click **Next**.



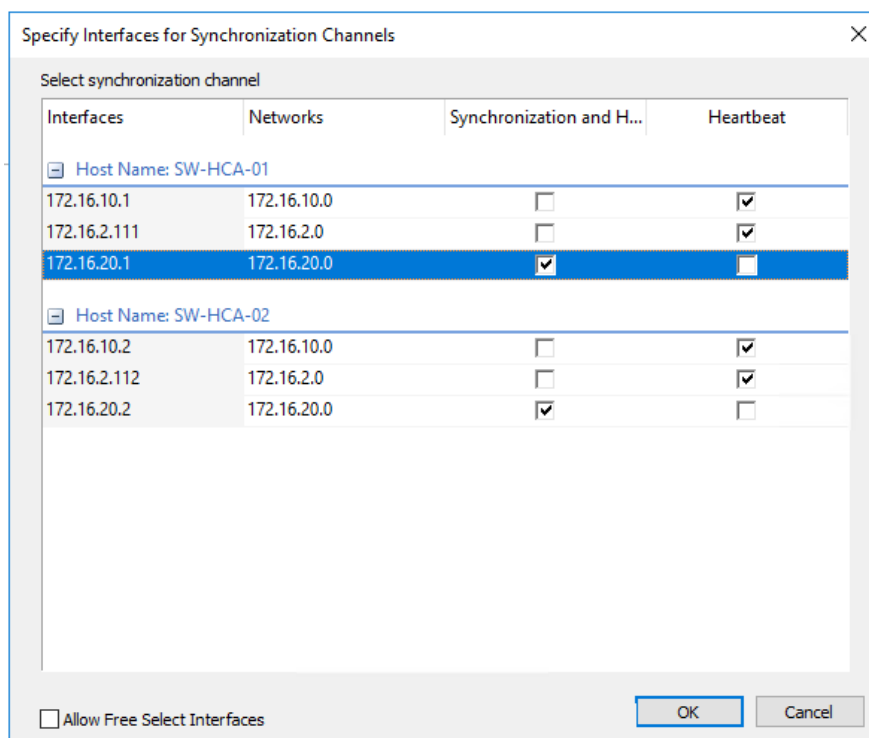
51. Choose the device **Location** and specify **Target Name** if required. Otherwise, the name will be generated automatically according to the specified target alias.



52. Click **Change Network Settings**.

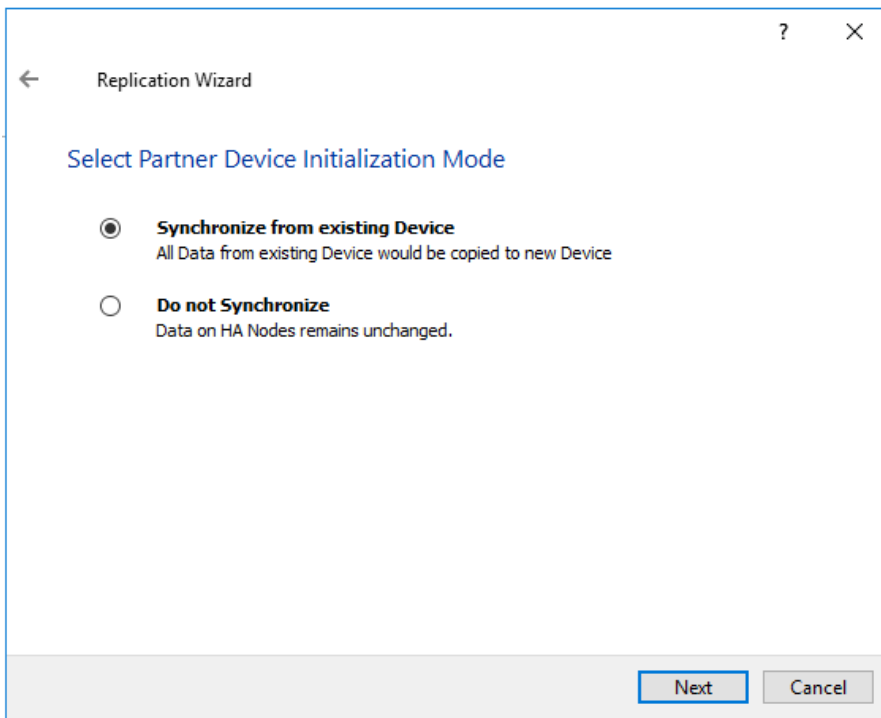


53. Specify Interfaces for Synchronization and Heartbeat channels.

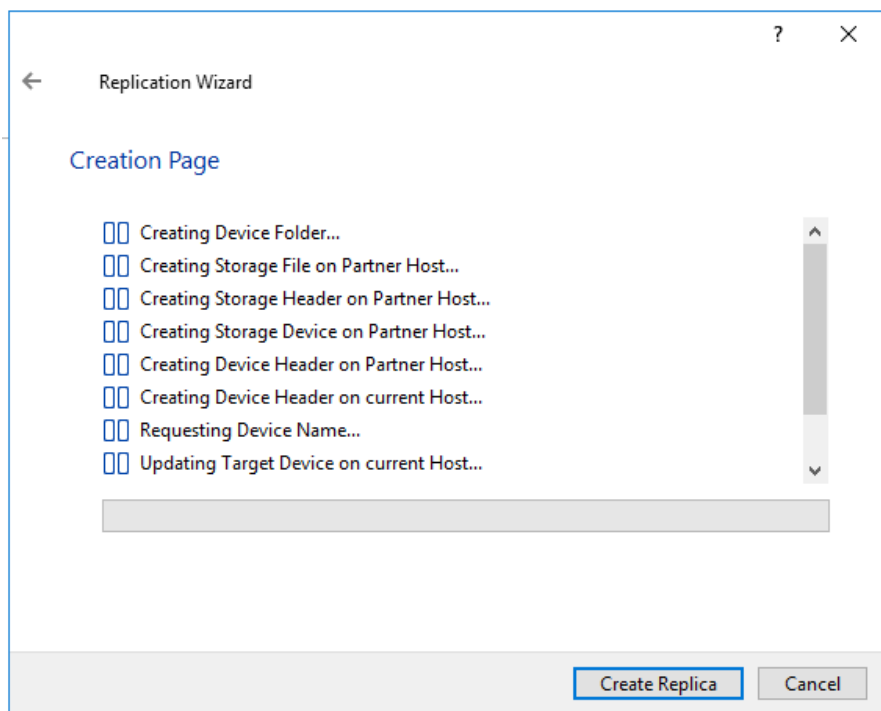


Click **OK**. Then click **Next**.

54. Choose **Synchronize from existing Device**

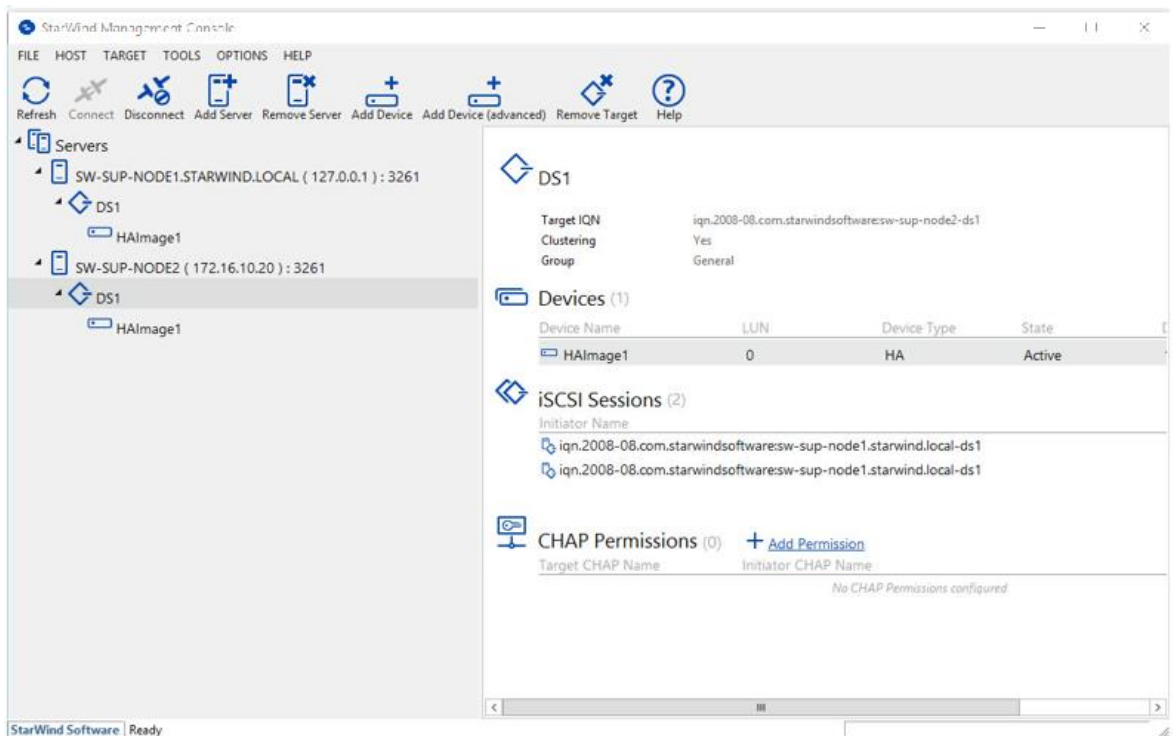


55. Click **Create Replica**.

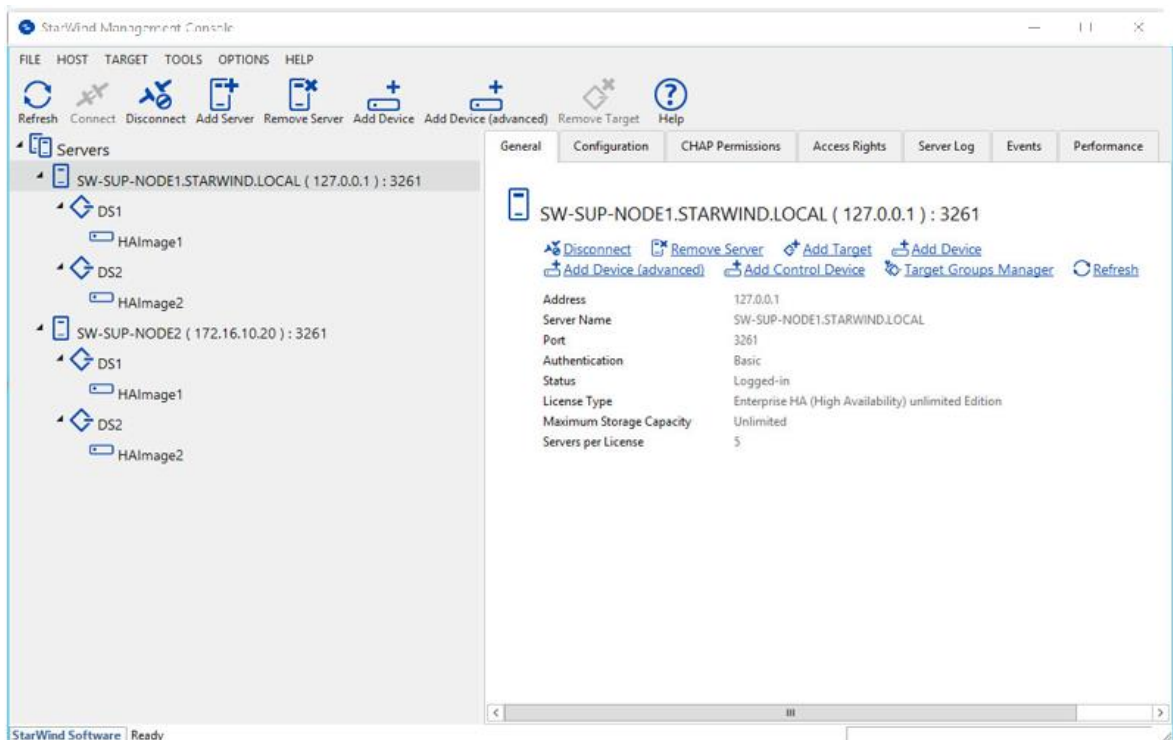


Click **Finish** to close the wizard.

56. The successfully added devices appear in **StarWind Management Console**.



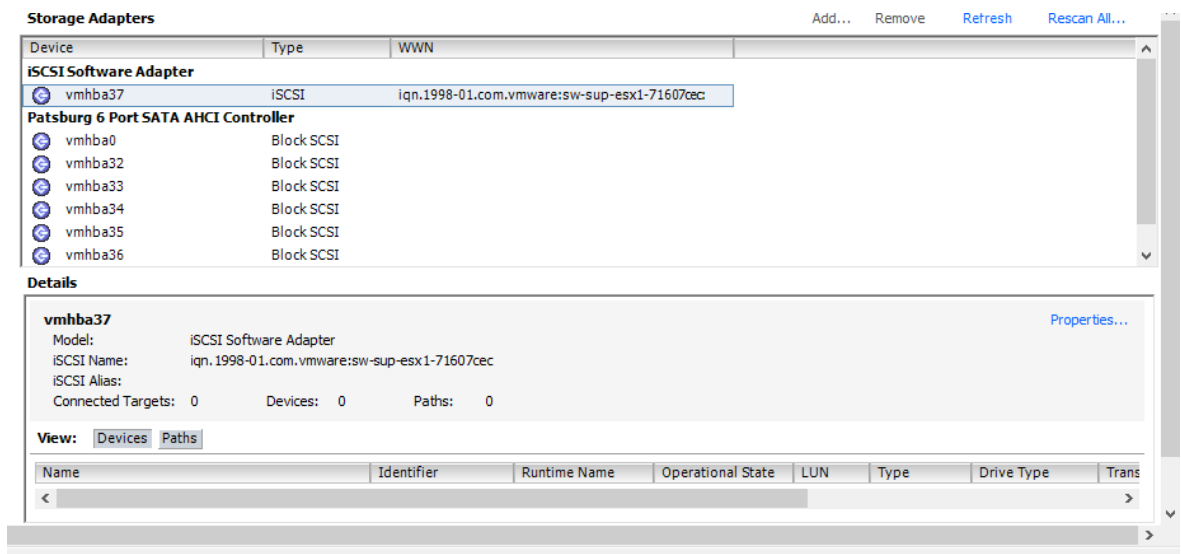
57. Repeat the steps described above to create other virtual disks that will be used as datastores.



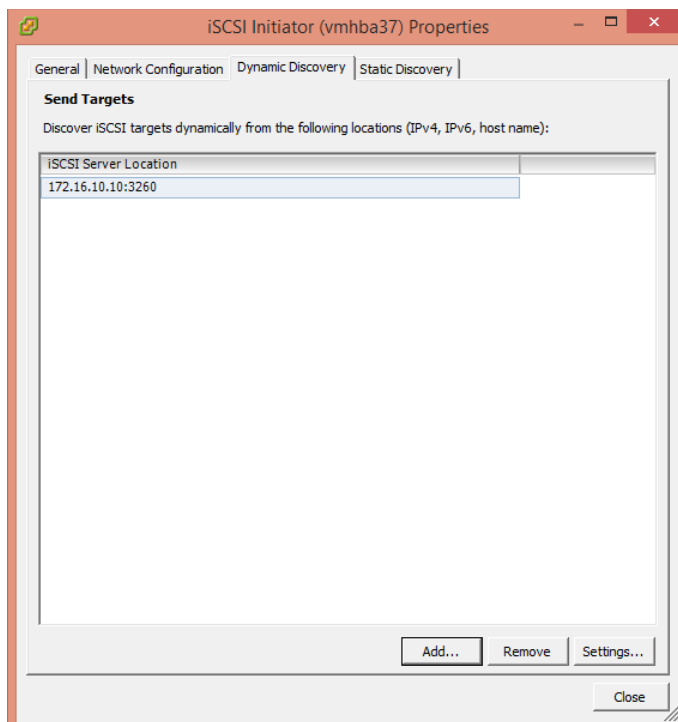
Preparing Datastores

Adding Discovery portals

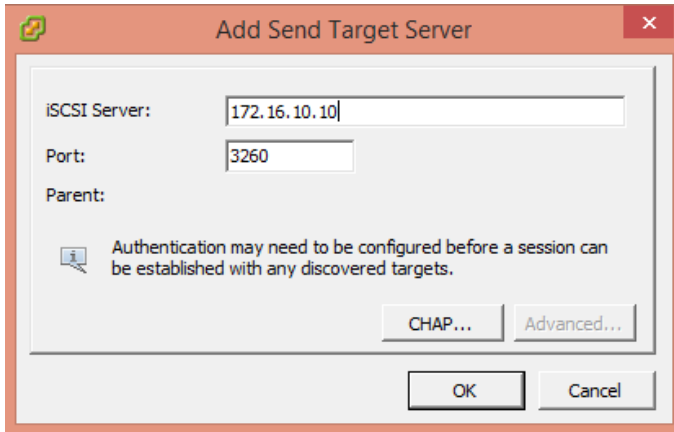
58. To connect the previously created devices to ESX host, navigate to the **Configuration** tab, then click on **Storage Adapters** and choose (or add) the iSCSI storage adapter. In the **Details** section, click the **Properties** tab.



59. In **Dynamic Discovery** click the **Add...** button to specify iSCSI interfaces.

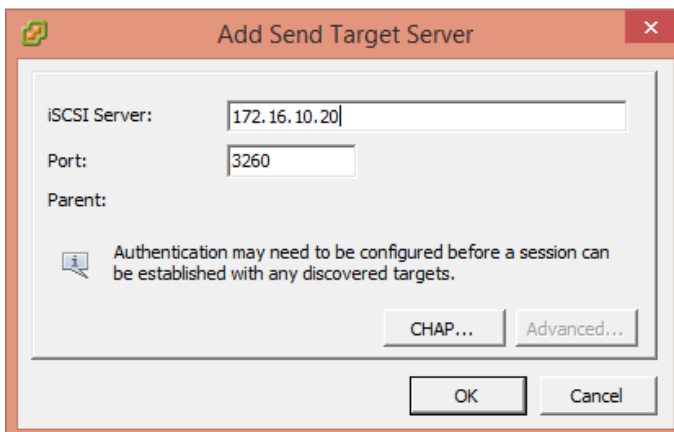


60. Enter the iSCSI IP address of the first StarWind node from the virtual local network 172.16.10.*



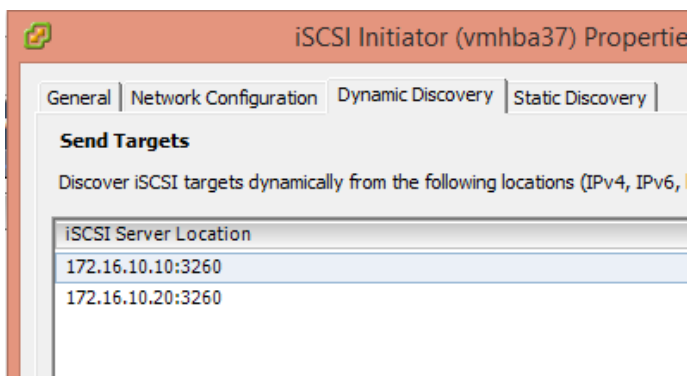
Click **OK**.

61. Add the IP address of the second StarWind node – 172.16.10.*

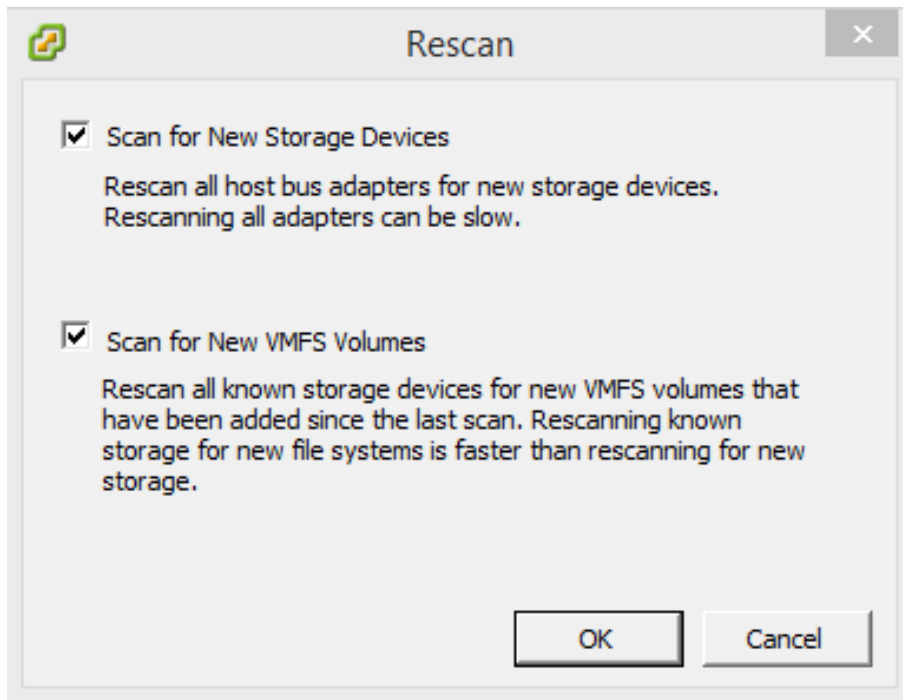


Click **OK**.

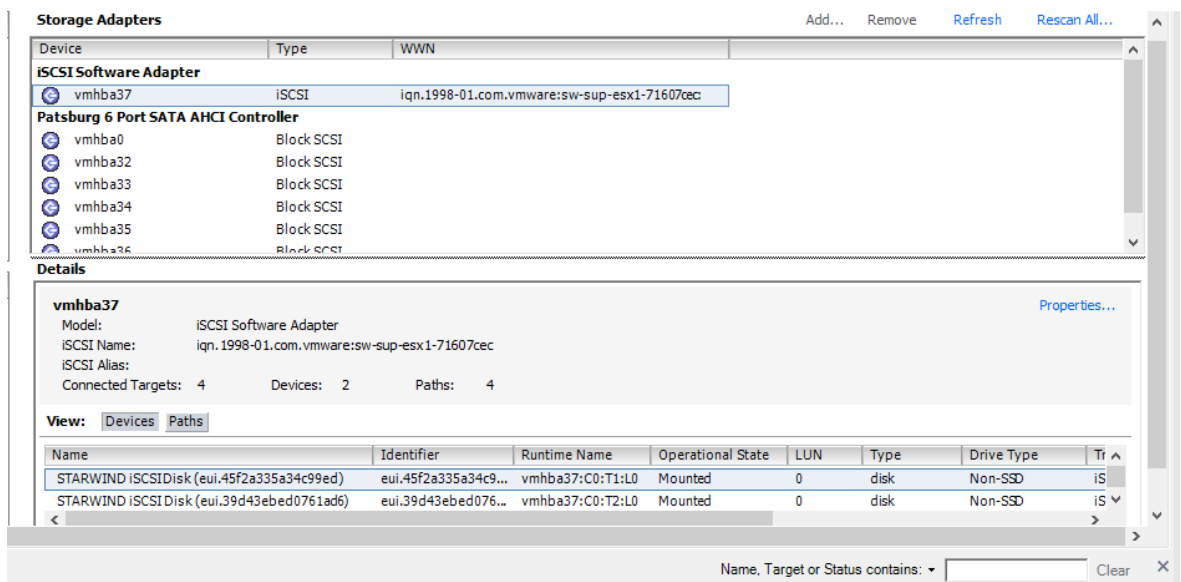
62. Everything should look like the image below.



63. Rescan the storage.



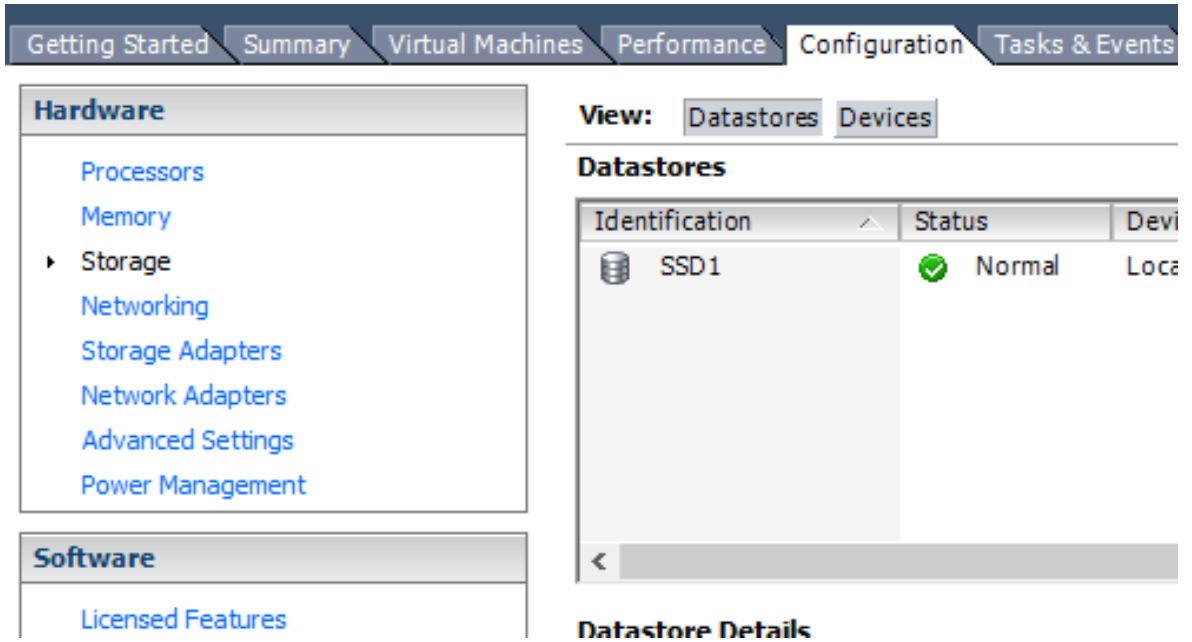
64. Now, the previously created StarWind devices are visible.



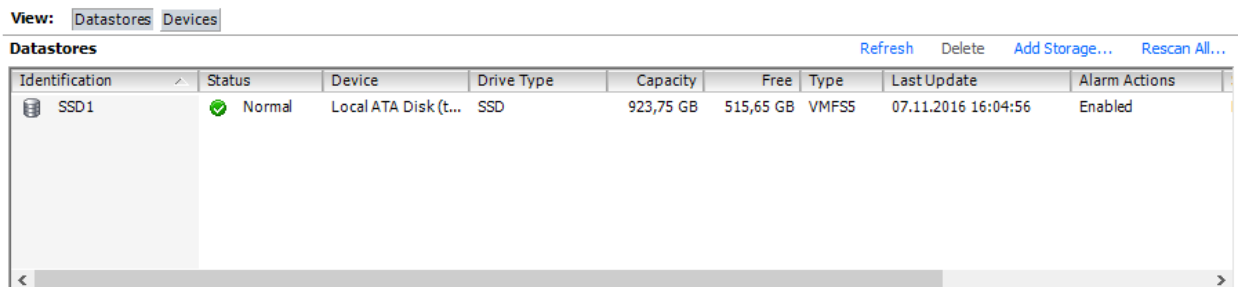
65. Repeat all the steps from this section for the other ESXi node, specifying the corresponding IP addresses for the iSCSI subnet.

Creating Datastores

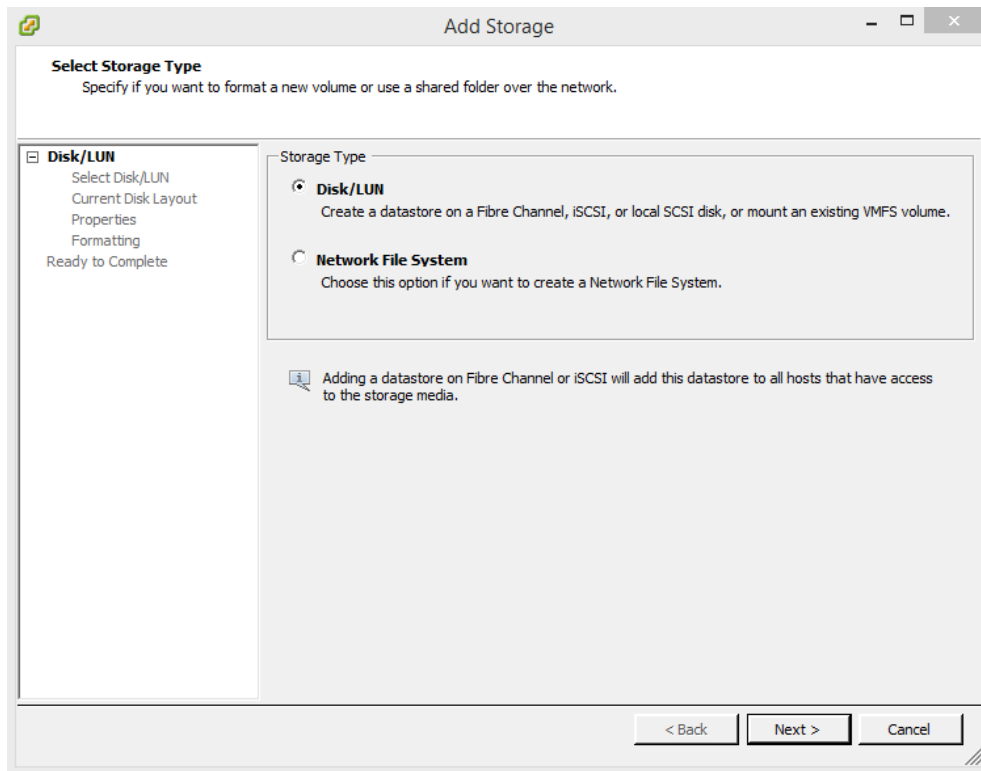
66. Open **Configuration** tab of any host and click **Storage**.



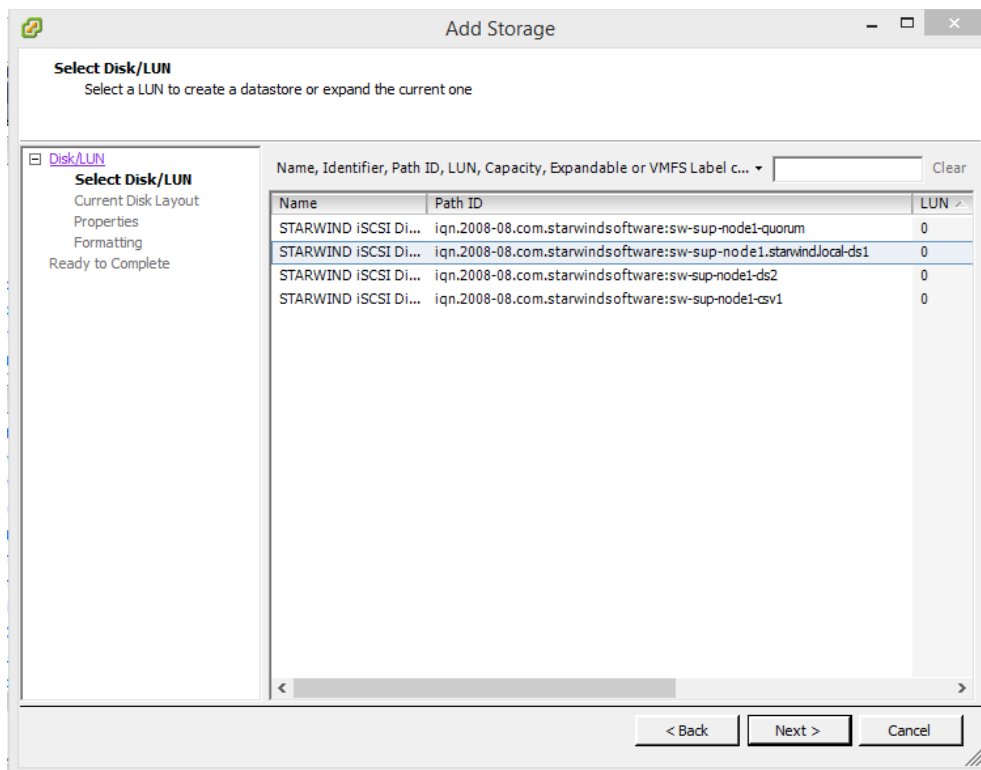
67. Click **Add Storage**.



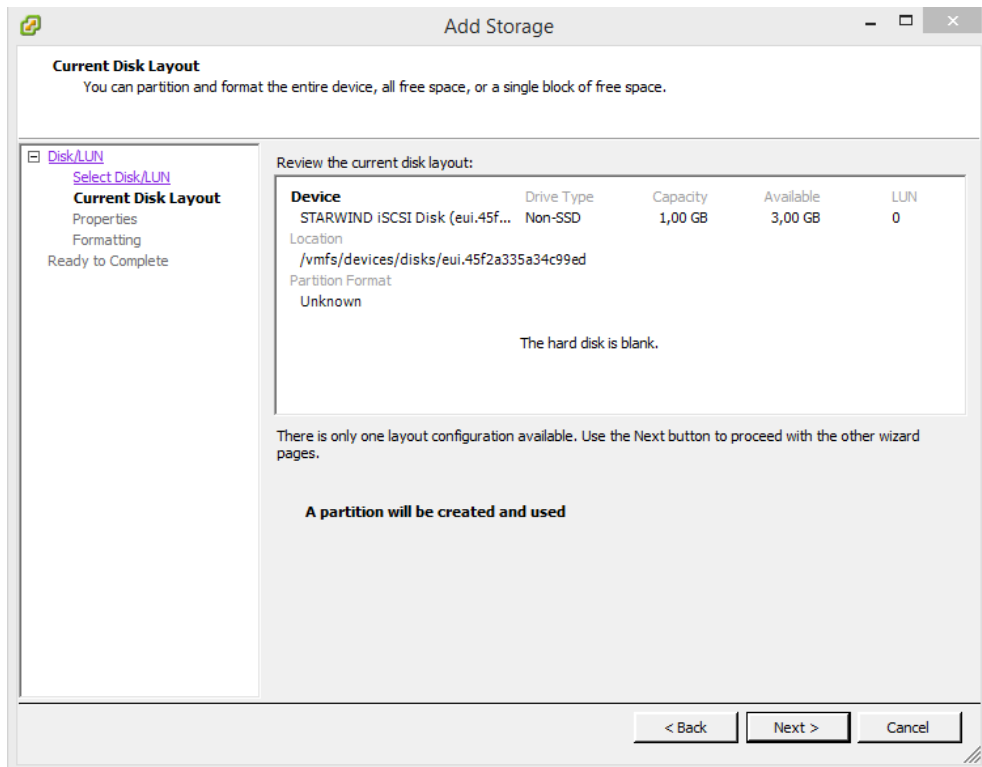
68. Select **Disk/LUN**.



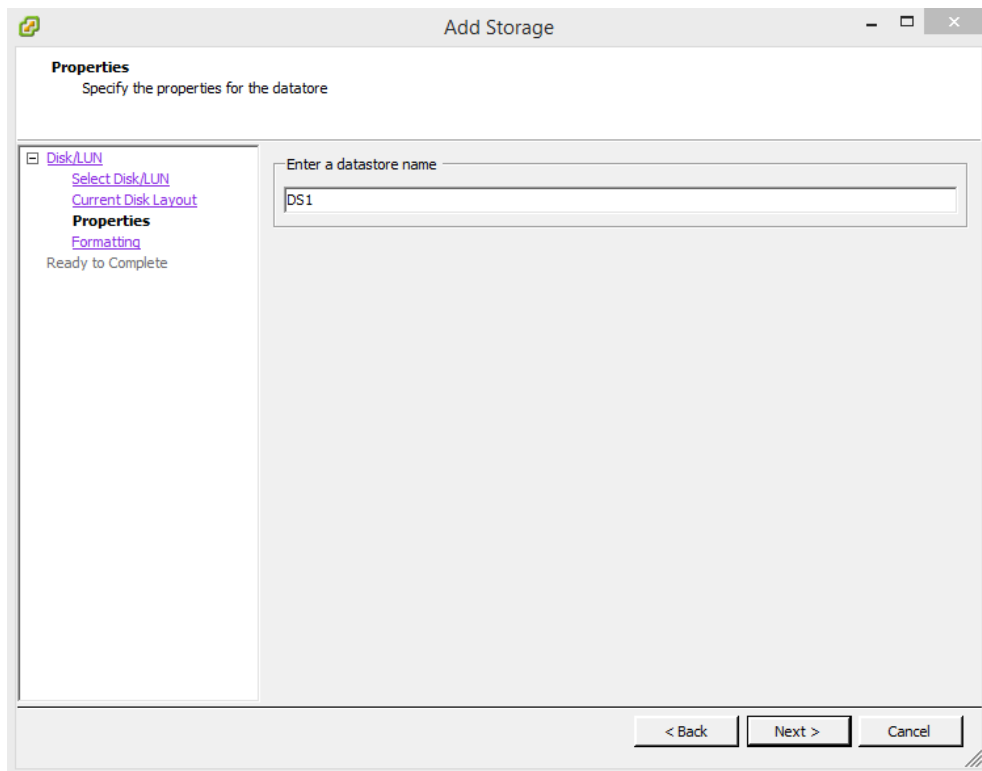
69. Select the previously discovered StarWind device and click **Next**.



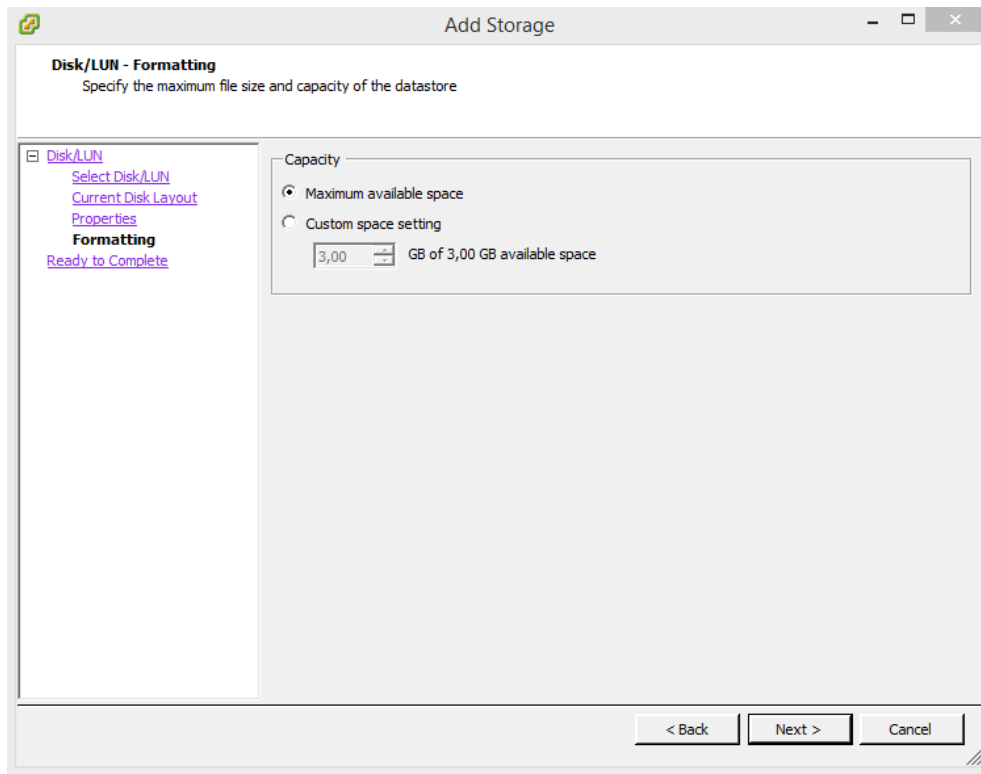
70. Check **Current Disk Layout** and click **Next**.



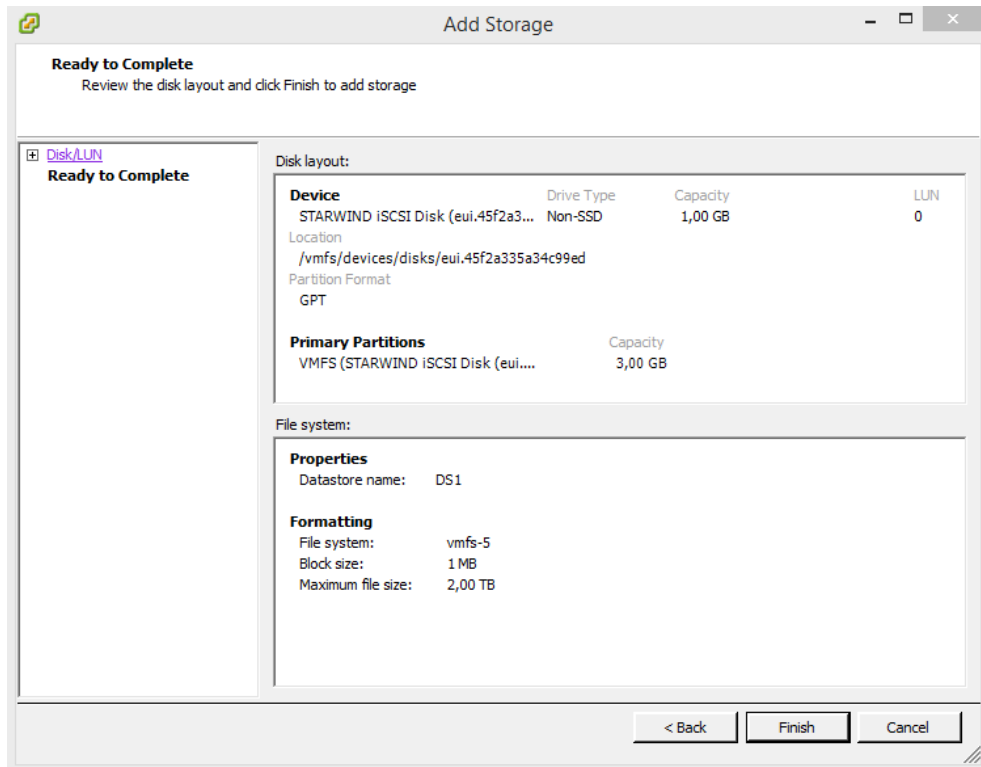
71. Specify the datastore name and click **Next**.



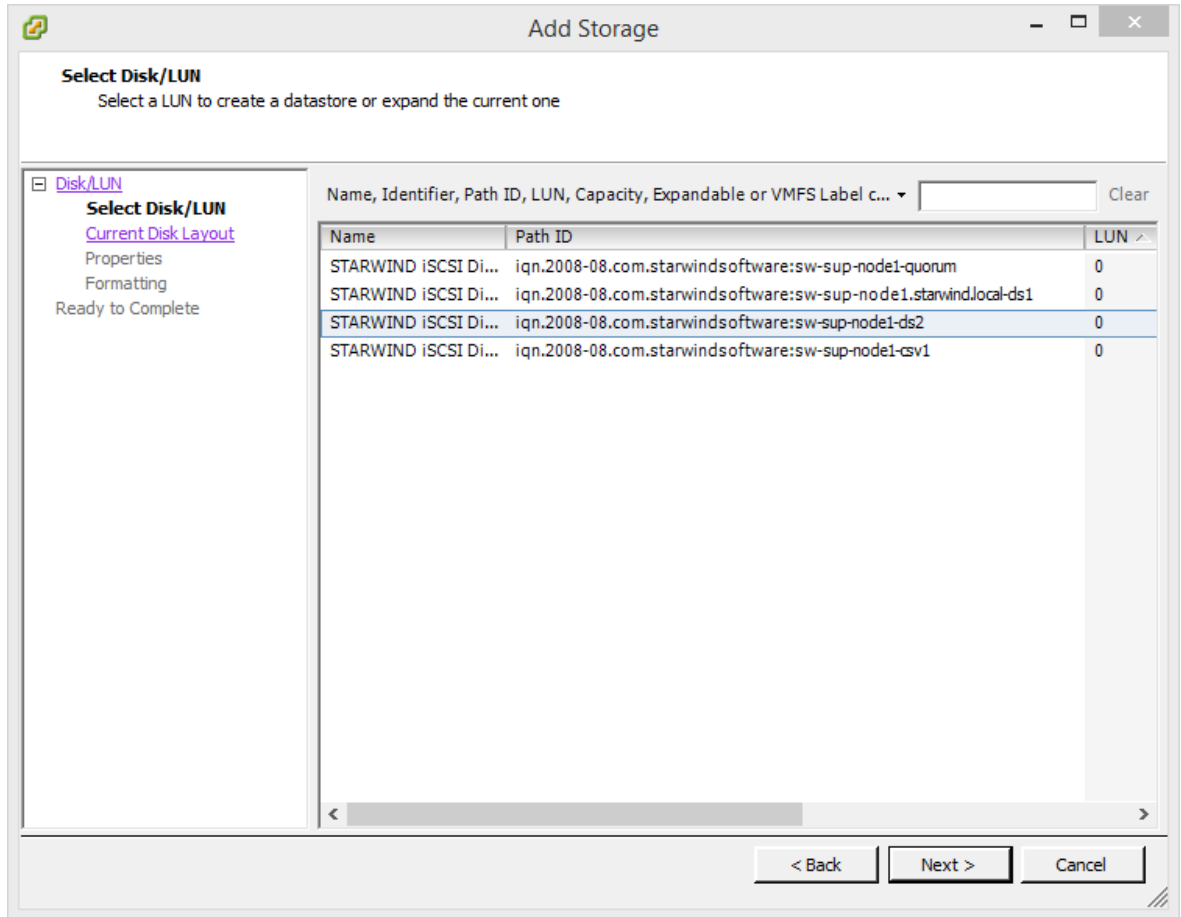
72. Enter the datastore size and click **Next**.



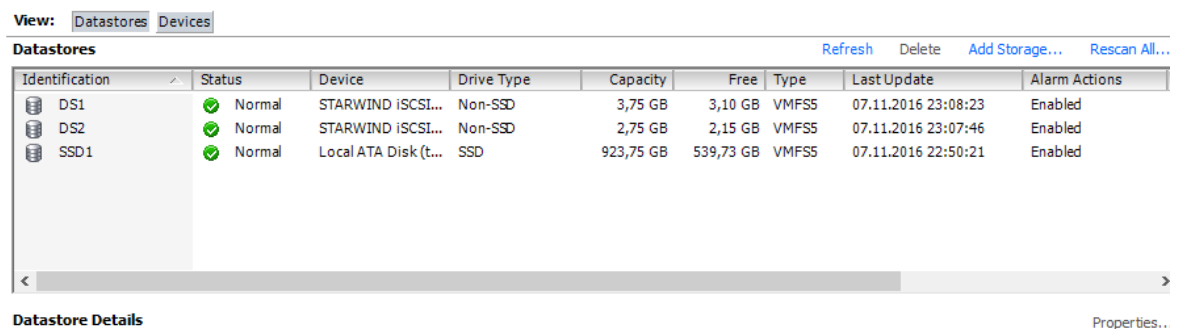
73. Verify the settings and click **Finish**.



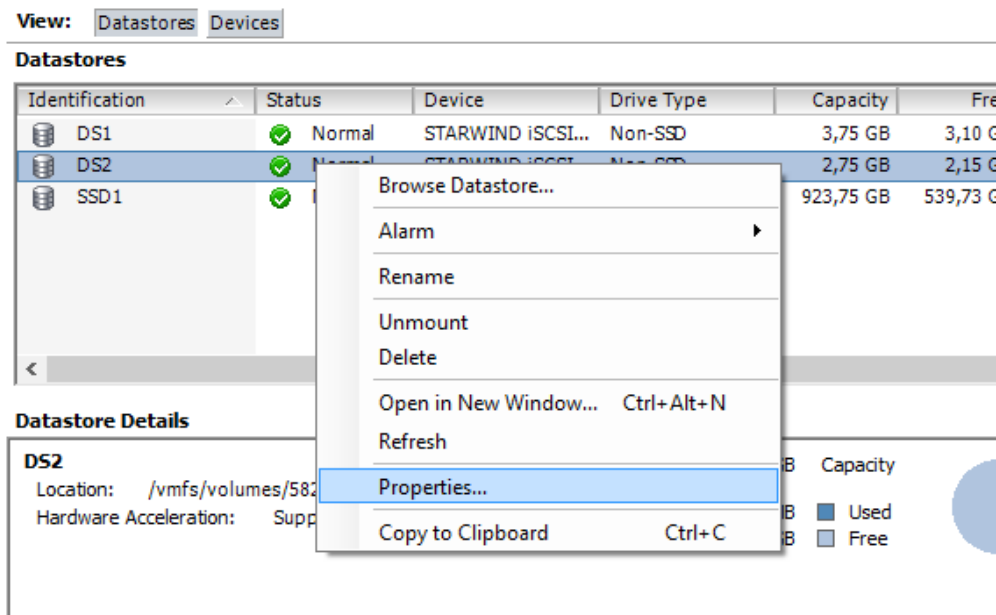
74. Add another Datastore (DS2) as it is described above but select the second device for that purpose.



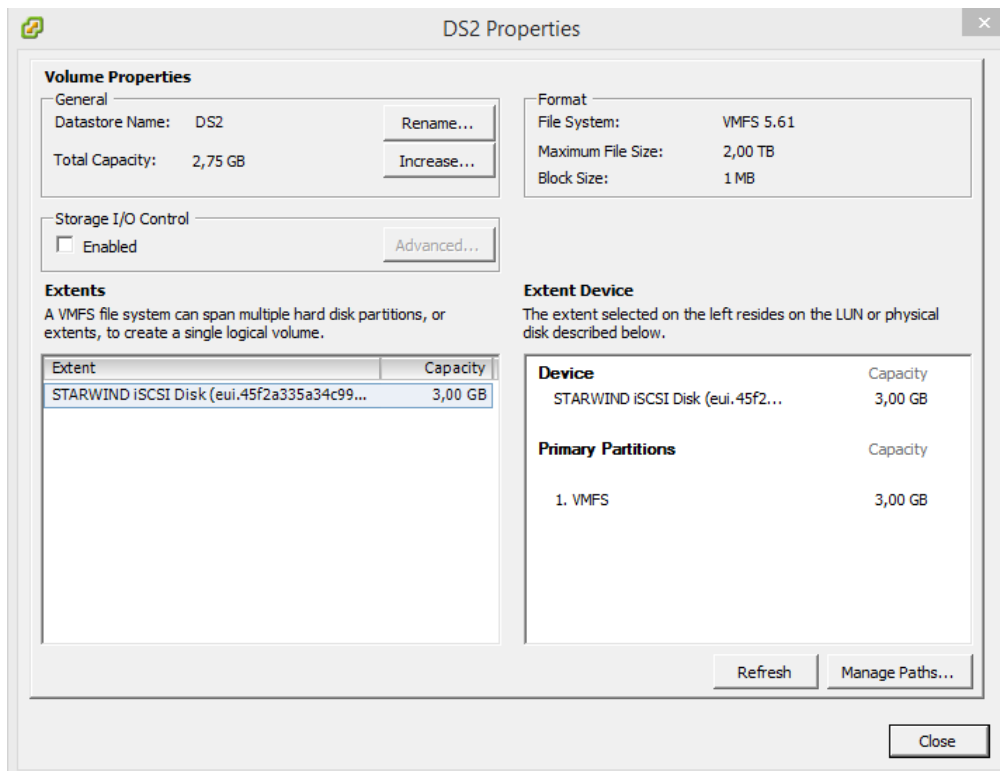
75. Verify that the storages (DS1, DS2) are connected to both hosts. Otherwise, rescan the storage adapter.



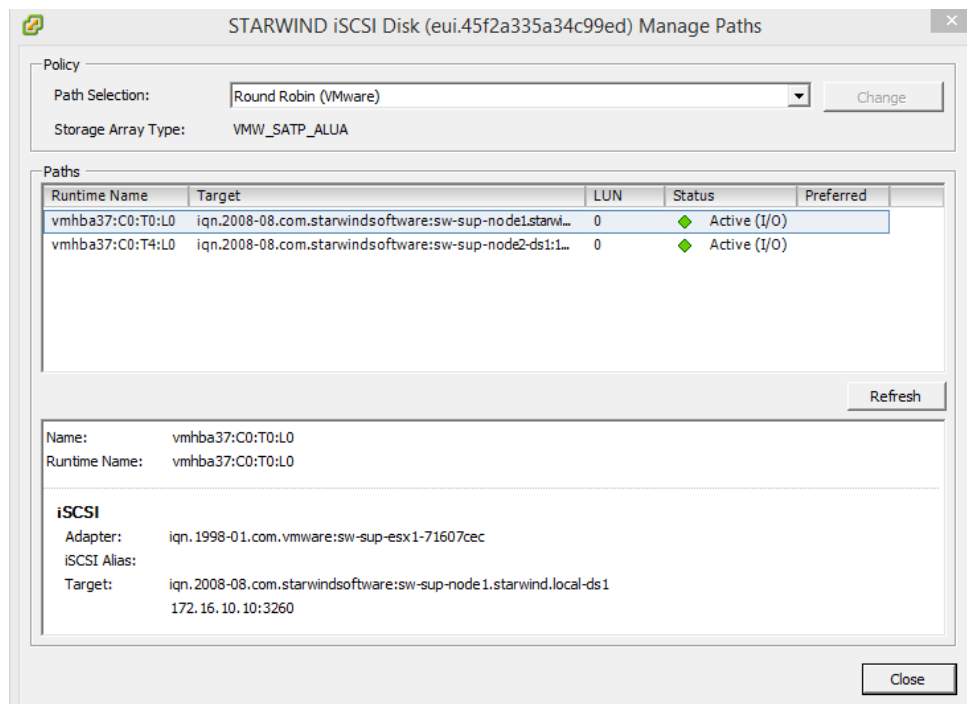
76. Right-click on a datastore and select **Properties**.



77. Click **Manage Paths**.



78. Change the **Path Selection** policy to the **Round Robin** one and click **Change**.



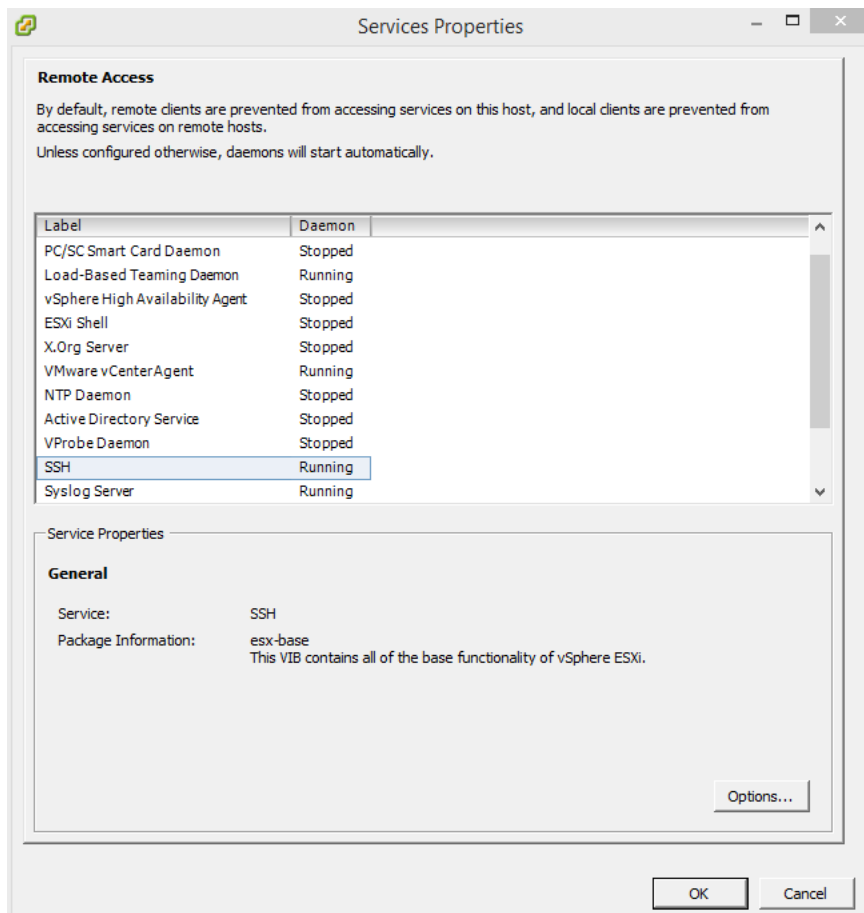
79. Repeat the same steps for each Datastore for each host.

Additional tweaks

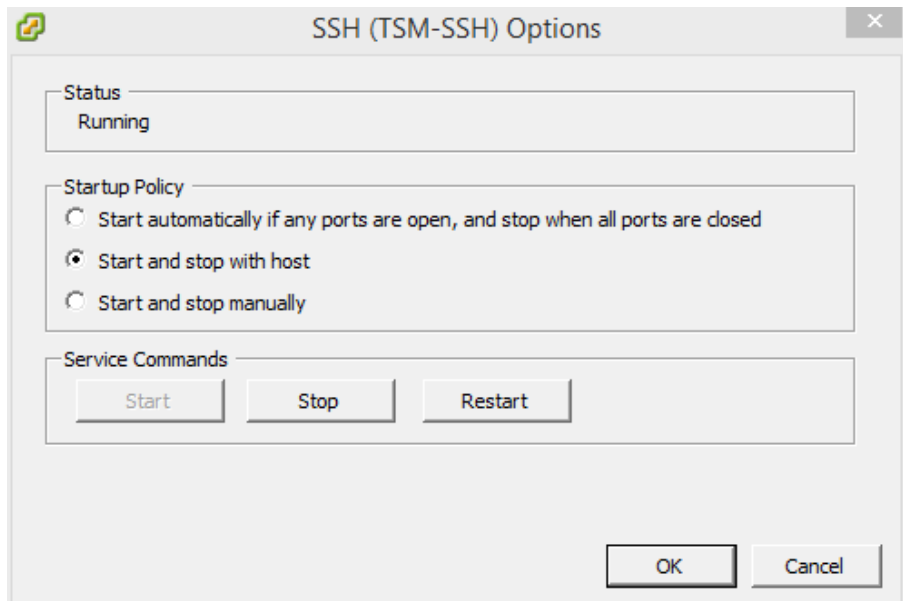
80. Click on the configuration tab of any host and choose **Security Profile**.

<ul style="list-style-type: none"> Networking Storage Adapters Network Adapters Advanced Settings Power Management 	<ul style="list-style-type: none"> vSphere High Availability Agent ESXi Shell X.Org Server VMware vCenter Agent NTP Daemon Active Directory Service VProbe Daemon SSH Syslog Server Direct Console UI CIM Server 																
<p>Software</p> <ul style="list-style-type: none"> Licensed Features Time Configuration DNS and Routing Authentication Services Power Management Virtual Machine Startup/Shutdown Virtual Machine Swapfile Location ▶ Security Profile Host Cache Configuration System Resource Reservation Agent VM Settings 	<p>Firewall</p> <hr/> <p>Incoming Connections</p> <table border="1"> <tr> <td>vSphere Web Client</td> <td>902,443 (TCP)</td> </tr> <tr> <td>DHCP Client</td> <td>68 (UDP)</td> </tr> <tr> <td>Virtual SAN Transport</td> <td>2233 (TCP)</td> </tr> <tr> <td>vsanvp</td> <td>8080 (TCP)</td> </tr> <tr> <td>SNMP Server</td> <td>161 (UDP)</td> </tr> <tr> <td>vMotion</td> <td>8000 (TCP)</td> </tr> <tr> <td>Virtual SAN Clustering Service</td> <td>12345,23451,12321 (UDP)</td> </tr> <tr> <td>CIM Secure Server</td> <td>5989 (TCP)</td> </tr> </table>	vSphere Web Client	902,443 (TCP)	DHCP Client	68 (UDP)	Virtual SAN Transport	2233 (TCP)	vsanvp	8080 (TCP)	SNMP Server	161 (UDP)	vMotion	8000 (TCP)	Virtual SAN Clustering Service	12345,23451,12321 (UDP)	CIM Secure Server	5989 (TCP)
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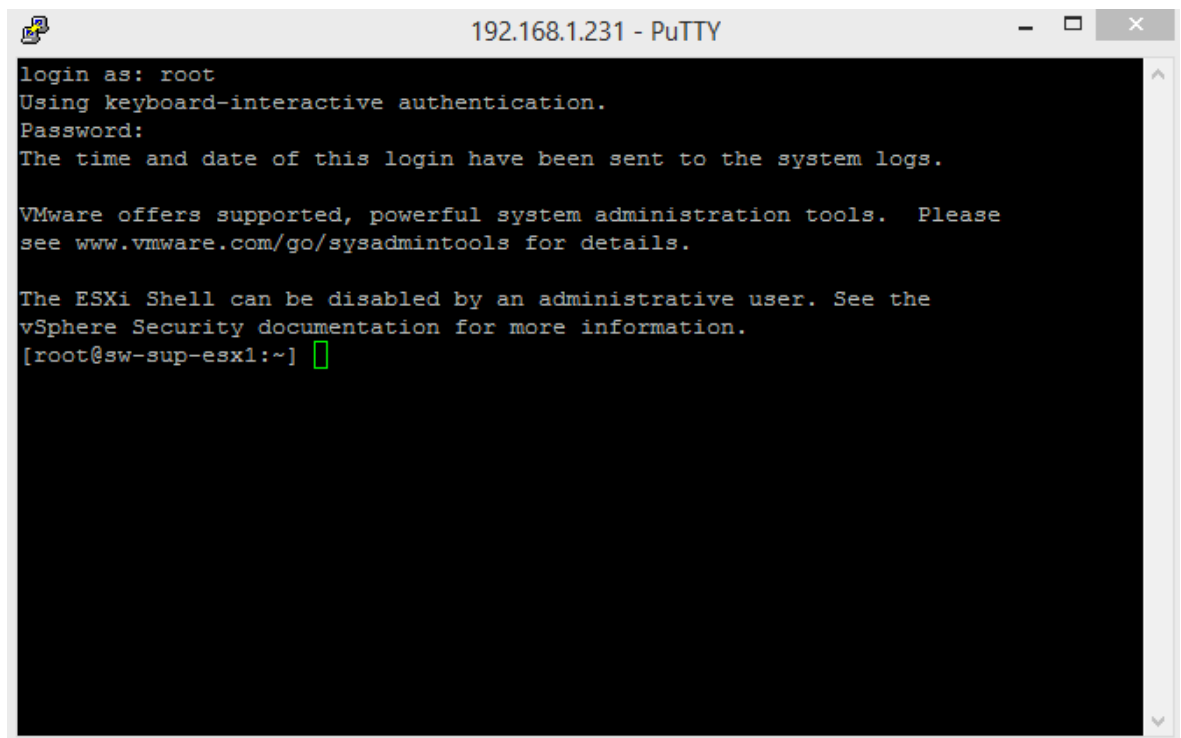
81. Choose **SSH** and click **Options**.



82. Select **Start and Stop with host** and press **Start**.



83. Connect to the host using an SSH client (e.g., Putty).



84. Check the device list using the following command:
esxcli storage nmp device list

85. For all devices, reduce Round Robin size from 1000 to 1 using the following command:
esxcli storage nmp psp roundrobin deviceconfig set --type=iops --iops=1 --device=

NOTE. Paste StarWind device UID at the end of the cmdlet.

```

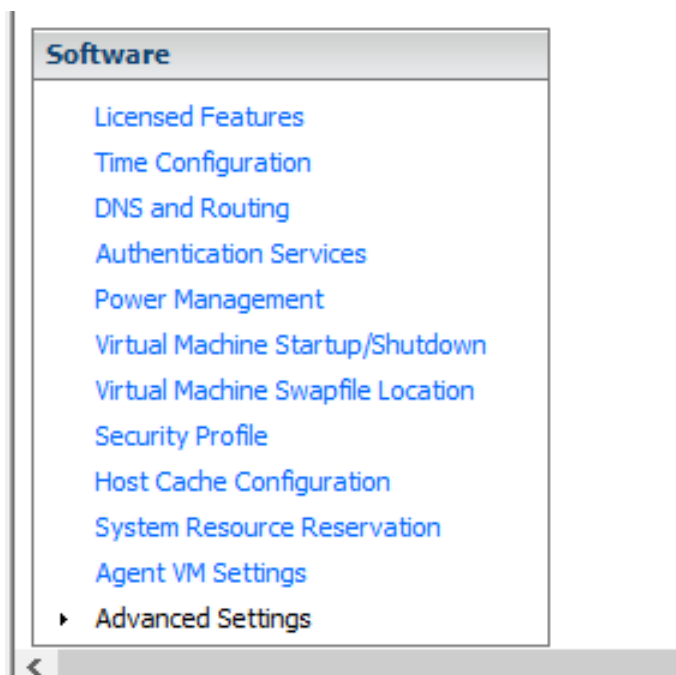
192.168.1.231 - PuTTY
Device Display Name: STARWIND iSCSI Disk (eui.39d43ebed0761ad6)
Storage Array Type: VMW_SATP_ALUA
Storage Array Type Device Config: {implicit_support=on;explicit_support=off;
explicit_allow=on;alua_followover=on; action_OnRetryErrors=off; {TPG_id=1,TPG_st
ate=AO}{TPG_id=2,TPG_state=AO}}
Path Selection Policy: VMW_PSP_MRU
Path Selection Policy Device Config: Current Path=vmhba37:C0:T5:L0
Path Selection Policy Device Custom Config:
Working Paths: vmhba37:C0:T5:L0
Is USB: false

eui.54fab8350efd268e
Device Display Name: STARWIND iSCSI Disk (eui.54fab8350efd268e)
Storage Array Type: VMW_SATP_ALUA
Storage Array Type Device Config: {implicit_support=on;explicit_support=off;
explicit_allow=on;alua_followover=on; action_OnRetryErrors=off; {TPG_id=2,TPG_st
ate=AO}{TPG_id=1,TPG_state=AO}}
Path Selection Policy: VMW_PSP_MRU
Path Selection Policy Device Config: Current Path=vmhba37:C0:T7:L0
Path Selection Policy Device Custom Config:
Working Paths: vmhba37:C0:T7:L0
Is USB: false

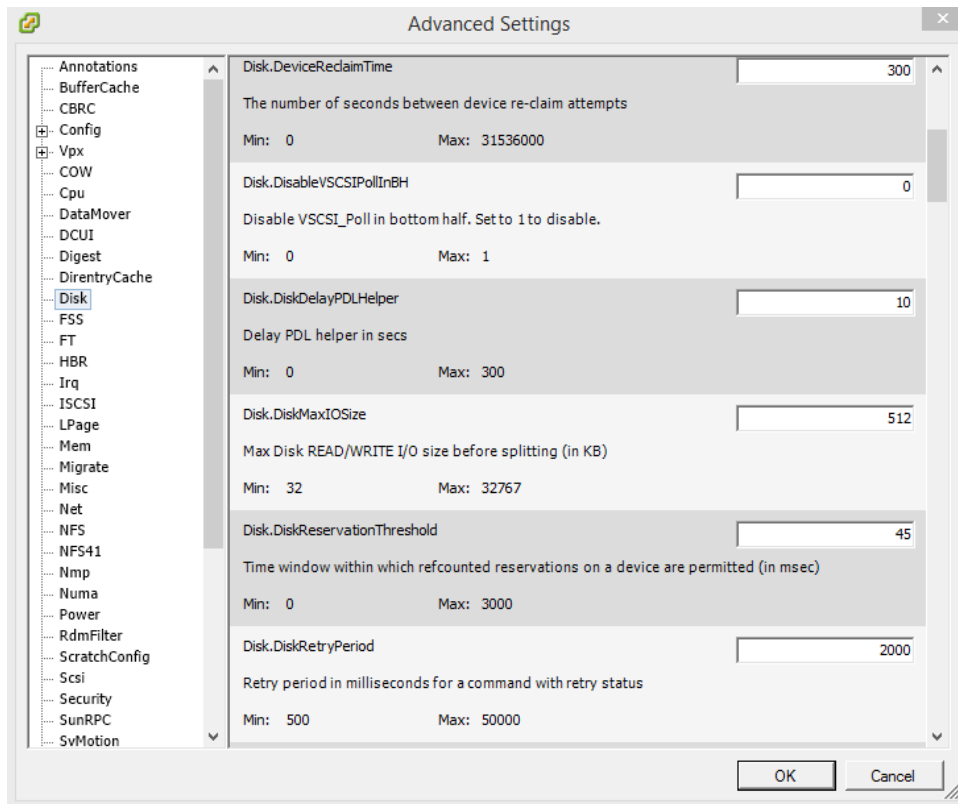
[root@sw-sup-esx1:~] esxcli storage nmp psp roundrobin deviceconfig set --type=i
ops --iops=1 --device=eui.54fab8350efd268e

```

86. Repeat the same steps for each host and datastore.
87. Click the configuration tab on any host and choose **Advanced Settings**.

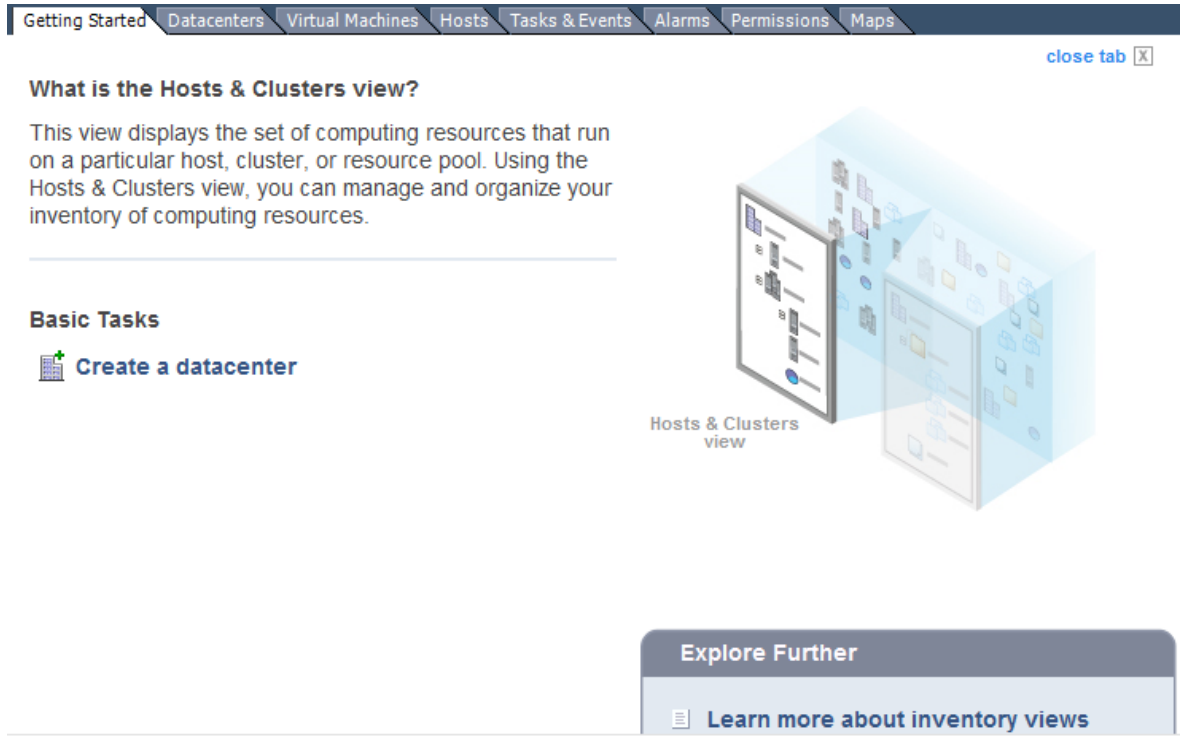


88. Select **Disk** and change the **Disk.DiskMaxIOSize** parameter to 512.



Creating a Datacenter

89. Connect to vCenter, click **Getting Started**, then **Create Datacenter**, and enter the Datacenter name.



The screenshot shows the vSphere interface with a navigation bar at the top containing tabs for 'Getting Started', 'Datacenters', 'Virtual Machines', 'Hosts', 'Tasks & Events', 'Alarms', 'Permissions', and 'Maps'. The 'Hosts & Clusters' view is active, displaying a 3D-style visualization of a datacenter with various server and storage icons. Below the navigation bar, the text 'close tab [X]' is visible. The main content area has the heading 'What is the Hosts & Clusters view?' followed by a paragraph: 'This view displays the set of computing resources that run on a particular host, cluster, or resource pool. Using the Hosts & Clusters view, you can manage and organize your inventory of computing resources.' Below this is a horizontal line and the section 'Basic Tasks' with a sub-link 'Create a datacenter' accompanied by a server icon. At the bottom right, there is an 'Explore Further' section with a link 'Learn more about inventory views'.

Creating a Cluster

90. Navigate to the Datacenter **Getting Started** tab and press **Create a cluster**.

Getting Started Summary Virtual Machines Hosts IP Pools Performance Tasks & Events Alarms Permissions Maps [close tab](#) X

What is a Datacenter?

A datacenter is the primary container of inventory objects such as hosts and virtual machines. From the datacenter, you can add and organize inventory objects. Typically, you add hosts, folders, and clusters to a datacenter.

vCenter Server can contain multiple datacenters. Large companies might use multiple datacenters to represent organizational units in their enterprise.

Inventory objects can interact within datacenters, but interaction across datacenters is limited. For example, you can move a virtual machine with vMotion technology across hosts within a datacenter but not to a host in another datacenter.

Basic Tasks

- Add a host**
- Create a cluster**
- Create a folder**

Explore Further

- Learn more about datacenters**

91. Enter the cluster name and click **Next**.

Name

SWCluster

Cluster Features

Select the features you would like to use with this cluster.

Turn On vSphere HA

vSphere HA detects failures and provides rapid recovery for the virtual machines running within a cluster. Core functionality includes host and virtual machine monitoring to minimize downtime when heartbeats cannot be detected.

vSphere HA must be turned on to use Fault Tolerance.

Turn On vSphere DRS

vSphere DRS enables vCenter Server to manage hosts as an aggregate pool of resources. Cluster resources can be divided into smaller resource pools for users, groups, and virtual machines.

vSphere DRS also enables vCenter Server to manage the assignment of virtual machines to hosts automatically, suggesting placement when virtual machines are powered on, and migrating running virtual machines to balance load and enforce resource allocation policies.

vSphere DRS and VMware EVC should be enabled in the cluster in order to permit placing and migrating VMs with Fault Tolerance turned on, during load balancing.

Adding Hosts to the Cluster

92. Open the **Cluster** tab and click **Add a host**.

Getting Started Summary Virtual Machines Hosts Resource Allocation Performance Tasks & Events Alarms Permissions [close tab](#)

What is a Cluster?

A cluster is a group of hosts. When you add a host to a cluster, the host's resources become part of the cluster's resources. The cluster manages the resources of all hosts within it.

Clusters enable the vSphere High Availability (HA) and vSphere Distributed Resource Scheduler (DRS) solutions.

Basic Tasks

- Add a host**
- Create new virtual machine**

Explore Further

- Learn more about clusters**

Cluster Virtual Machines Host
vCenter Server Datacenter
vSphere Client

93. Enter the name or IP address of the ESXi host and specify the administrative account. Click **Next**.

Specify Connection Settings

Type in the information used to connect to this host.

Connection Settings

Host Summary
Ready to Complete

Connection

Enter the name or IP address of the host to add to vCenter.

Host:

Authorization

Enter the administrative account information for the host. vSphere Client will use this information to connect to the host and establish a permanent account for its operations.

Username:

Password:

< Back Next > Cancel

94. Verify settings and click **Next**.

Host Information
Review the product information for the specified host.

Connection Settings
Host Summary
Assign License
Lockdown Mode
Ready to Complete

You have chosen to add the following host to vCenter:

Name: 192.168.1.231
Vendor: Gigabyte Technology Co., Ltd.
Model: To be filled by O.E.M.
Version: VMware ESXi 6.0.0 build-3620759

Virtual Machines:

< Back Next > Cancel

95. **Assign the License** and click **Next**.

Assign License
Assign an existing or a new license key to this host.

Connection Settings
Host Summary
Assign License
Lockdown Mode
Ready to Complete

Assign an existing license key to this host

Product	Available
<input type="checkbox"/> Evaluation Mode	
<input checked="" type="radio"/> (No LicenseKey)	

Assign a new license key to this host

Enter Key...

Product: VMware vSphere 6 Enterprise Plus (unlimited cor...
Capacity: Unlimited CPUs
Available: Unlimited CPUs
Expires: Never
Label:

< Back Next > Cancel

96. **NOTE: Lockdown mode** is not enabled by default. Click **Next**.

Configure Lockdown Mode

Specify whether lockdown mode is to be enabled for this host.

Connection Settings
Host Summary
Assign License
Lockdown Mode
Ready to Complete

Lockdown Mode

When enabled, lockdown mode prevents remote users from logging directly into this host. The host will only be accessible through local console or an authorized centralized management application.

If you are unsure what to do, leave this box unchecked. You can configure lockdown mode later by navigating to the host's Configuration tab and editing its Security Profile.

Enable Lockdown Mode

< Back Next > Cancel

97. Verify the settings and click **Finish**.

Ready to Complete

Review the options you have selected and click Finish to add the host.

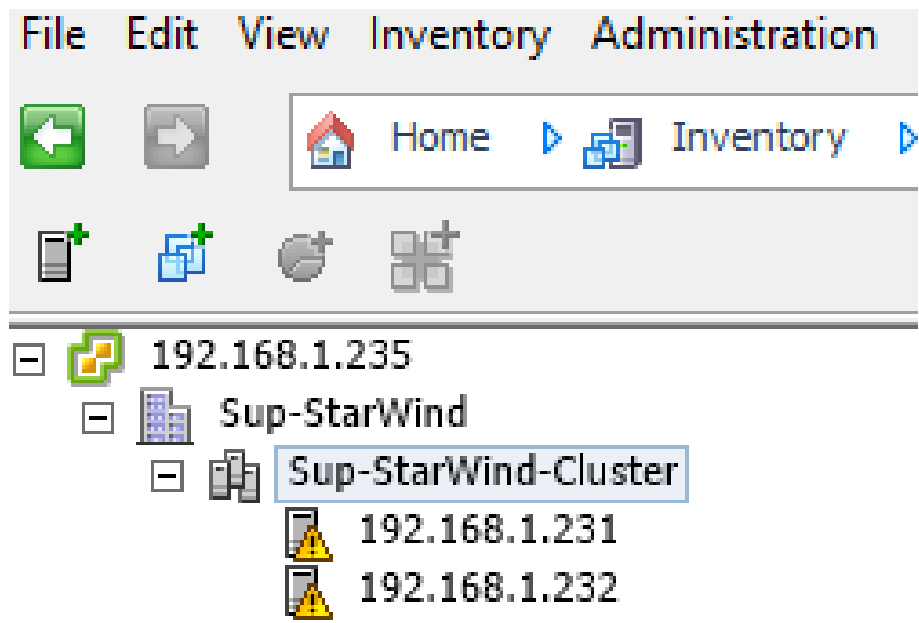
Connection Settings
Host Summary
Assign License
Lockdown Mode
Ready to Complete

Review this summary and click Finish.

Host: 192.168.1.231
Version: VMware ESXi 6.0.0 build-3620759
Networks: VM Network
iSCSI_for_VMs
Sync_for_VMs
VM Network 2
Datastores: SSD1
Lockdown Mode: Disabled

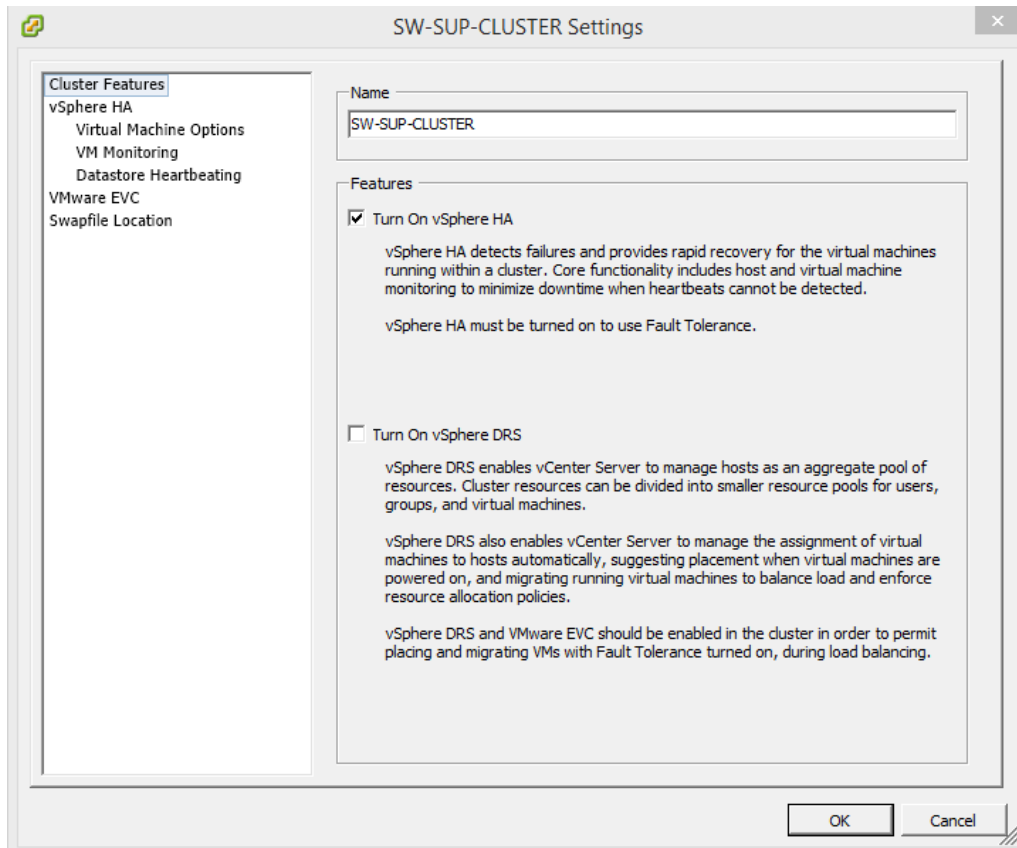
< Back Finish Cancel

98. Add the second host to the cluster.



Turn on vSphere HA Feature






99. Open the cluster **Edit Settings** and click **Turn on vSphere HA**. Press **OK**.



Conclusion

This technical paper covers **StarWind VSAN** configuration with VMware vSphere 6.0 and below for minimalistic hyperconverged 2-node scenario. In this setup, all virtual machines are stored on the shared storage provided by **StarWind**. VMware HA ensures VMs redundancy, while StarWind is responsible for the storage uptime. The combination of StarWind shared storage and VMware HA delivers high availability for applications and data across the entire virtualized environment. Using **StarWind VSAN**, the local storage resources of both ESXi hosts are turned into a fault-tolerant shared storage synchronously "mirrored" between the nodes. Being nested inside a VM and run on both ESXi hosts, StarWind VSAN ensures data safety and maintains the continuous application availability.

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