StarWind Virtual SAN®

Installation and Configuration of HyperConverged 2 Nodes with Hyper-V Cluster

Windows Server 2012 R2 Certified

vmware® READY

CiTRIX® ready™

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In 2016, Gartner named StarWind "Cool Vendor for Compute Platforms".

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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.

Contents

Introduction

StarWind Virtual SAN® is a native Windows hypervisor-centric hardware-less VM storage solution. It creates a fully fault tolerant and high performing storage pool built for the virtualization workloads by mirroring existing server's storage and RAM between the participating storage cluster nodes. The mirrored storage resource is then connected to all cluster nodes and treated just as local storage by all hypervisors and clustered applications. High Availability is achieved by providing multipath access to all storage nodes. **StarWind Virtual SAN** delivers supreme performance compared to any dedicated SAN solution since it runs locally on the hypervisor and all I/O is processed by local RAM, SSD cache, and disks. This way it never gets bottlenecked by storage fabric.

This guide was written for experienced Windows Server users or system administrators. It provides detailed instructions on how to setup 2 node HyperConverged Hyper-V Cluster with **StarWind Virtual SAN** as a storage provider.

A full set of 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 the Servers

Here is a reference network diagram of the configuration described in this guide.
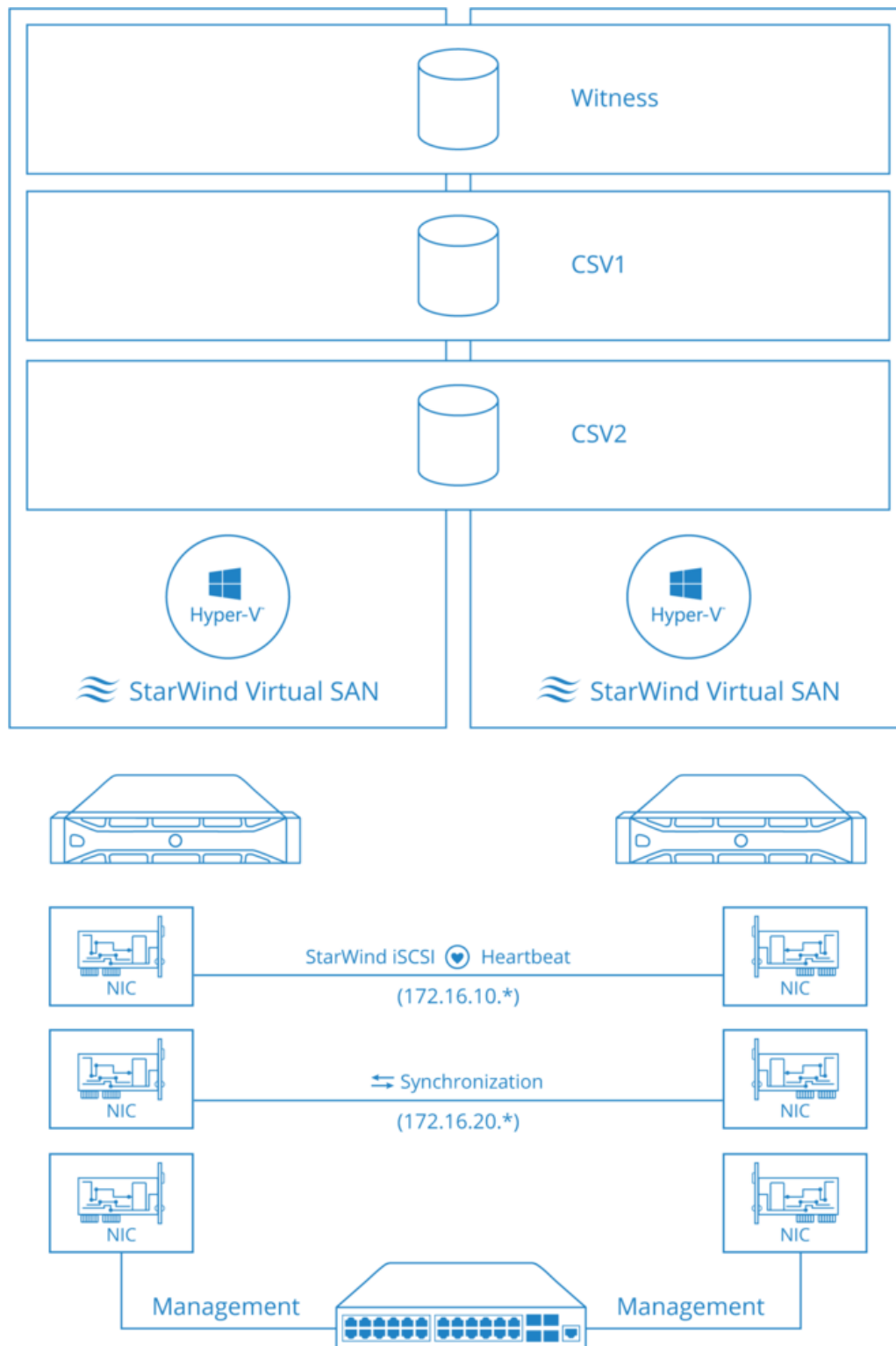
Additional network connections may be necessary depending on the cluster setup and applications requirements.

1. Make sure you have a domain controller and that you have added the servers to the domain.

2. Install **Failover Clustering** and **Multipath I/O** features, as well as the **Hyper-V** role on both servers. That can be done through **Server Manager (Add Roles and Features** menu item).

3. In order to allow **StarWind Virtual SAN** use the Loopback accelerator driver and access the local data faster, you should add a minor modification to the StarWind configuration file.
    Locate the StarWind Virtual SAN configuration file and open it using Notepad.

    The default path is:
    C:\Program Files\StarWind Software\StarWind\StarWind.cfg
    Find the string «<!--<iScsiDiscoveryListInterfaces value=»1»/> -->» and uncomment it (should look as follows: <iScsiDiscoveryListInterfaces value=»1»/>). Save the changes and exit Notepad.
    Note that is case there are any issues with saving the recently changed *.cfg file, launch Notepad with Administrator rights and then load the starwind.cfg file to make modifications.
    Restart StarWind Virtual SAN Service after the *.cfg modification.

Enabling Multipath Support

4.   Open the MPIO manager: Start->Administrative Tools->MPIO.

5.   Go to **the Discover Multi-Paths** tab.

6.   Tick **the Add support for iSCSI devices** checkbox.
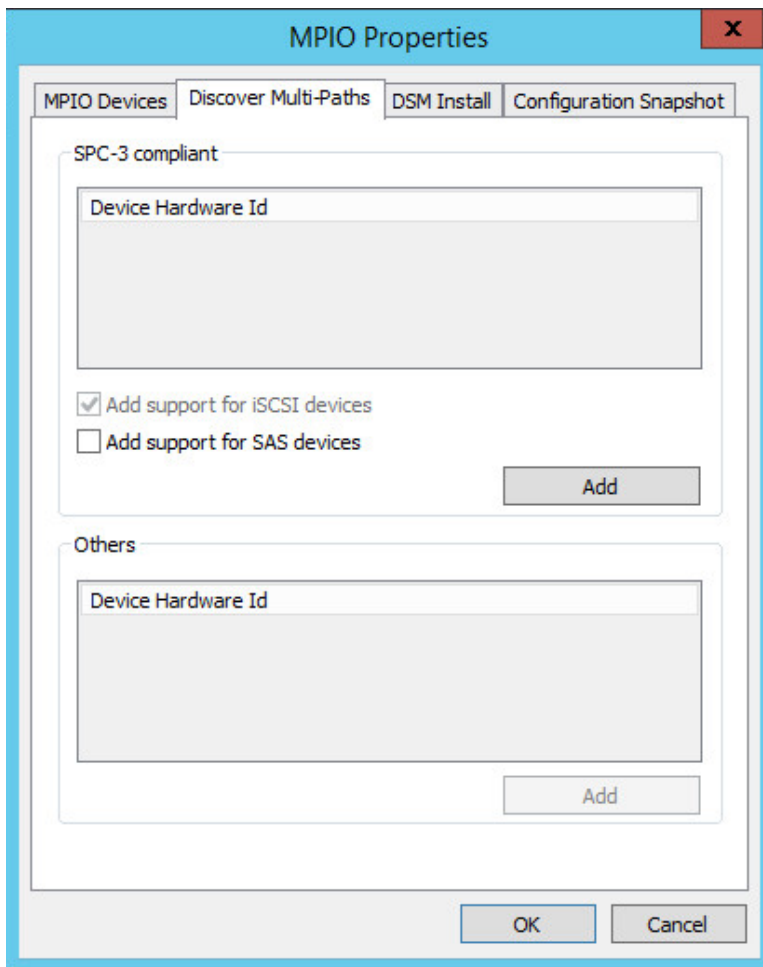
Click **Add**.

7.   When prompted to restart the server, click **Yes** to proceed.

NOTE: Repeat the procedure on the second server as well.

Downloading, Installing, and Registering the Software

8.   Download the StarWind setup executable file from our website by following next link:
       https://www.starwind.com/registration-starwind-virtual-san

NOTE: The setup file is the same for x86 and x64 systems, as well as for all Virtual SAN
deployment scenarios.

9.   Launch the downloaded setup file on the server where you wish to install
       StarWind Virtual SAN or one of its components. The Setup wizard will appear:

Click **Next** to continue.

10.   Read and accept the License Agreement.
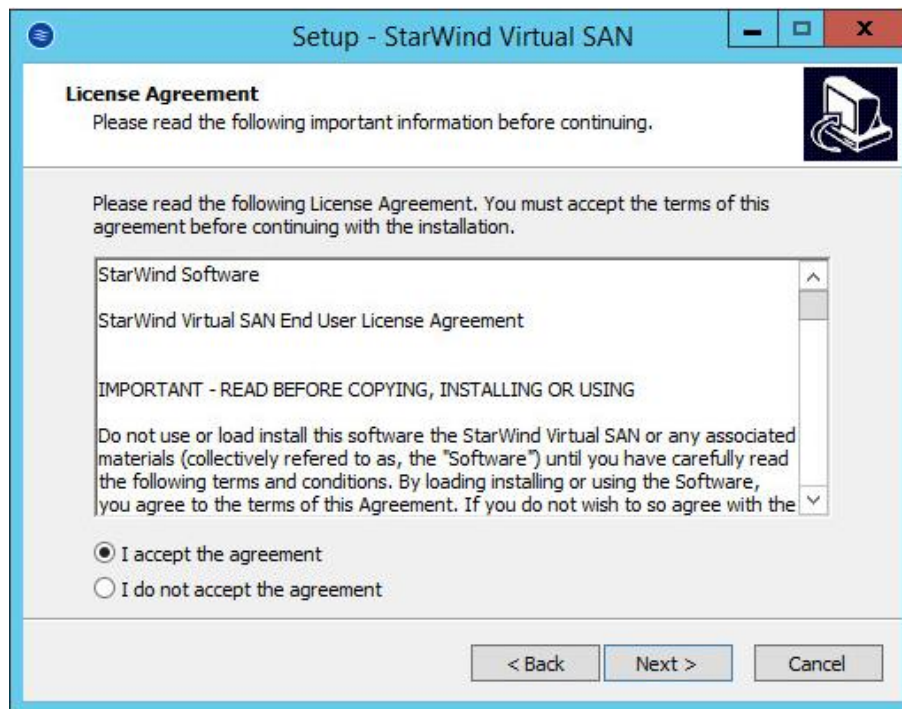
Click **Next** to continue.

11.   Carefully read the information about new features and improvements.
         Red text indicates warnings for users who are updating existing software installations.
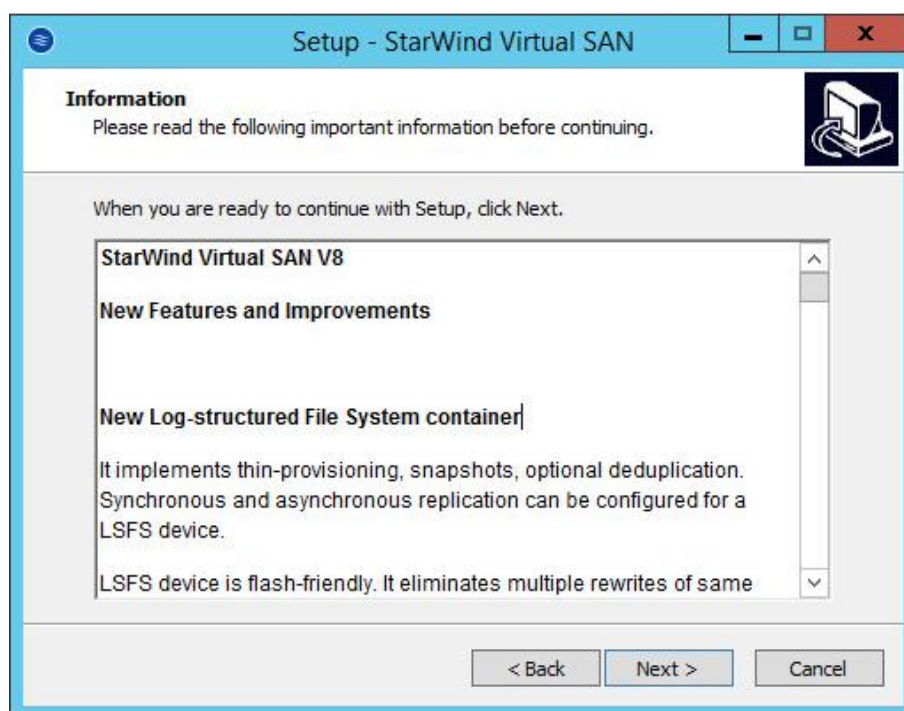
Click **Next** to continue.

12.   Click Browse to modify the installation path if necessary.
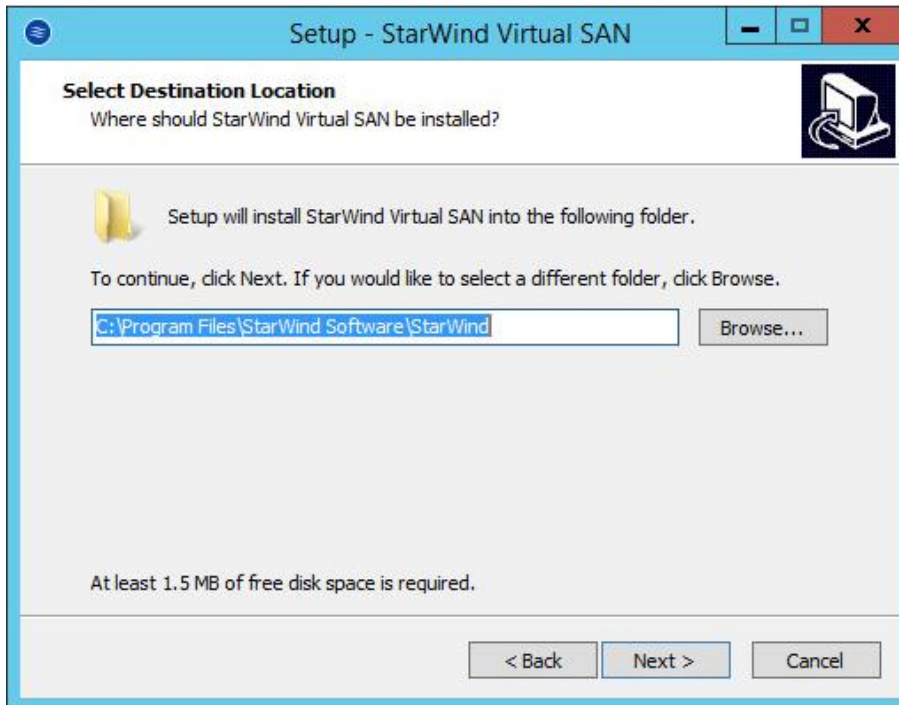
Click **Next** to continue.

13.   Specify one of the following installation types:

• StarWind Virtual SAN Server (recommended)

Full installation includes both StarWind Service and Management Console elements. It allows users to manage storage resources on the machine where StarWind Virtual SAN is installed, as well as manage other StarWind Virtual SAN installations on the network.

• StarWind Virtual SAN Service

This installation type is designed for Core OS editions. StarWind Service is the core of the software. It can create iSCSI targets as well as share virtual and physical devices. Service can be managed using StarWind Management Console from any Windows computer on the network that has StarWind Management Console installed.

• StarWind Management Console

The 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 connected to the network StarWind Virtual SAN servers).
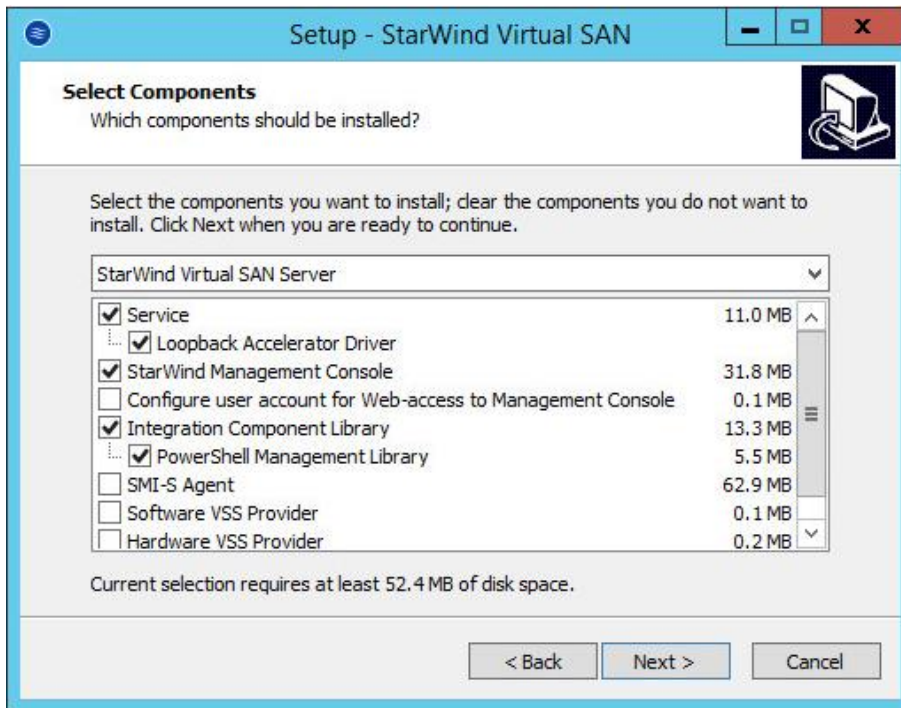
Click **Next** to continue.

14.   Specify the Start Menu folder.
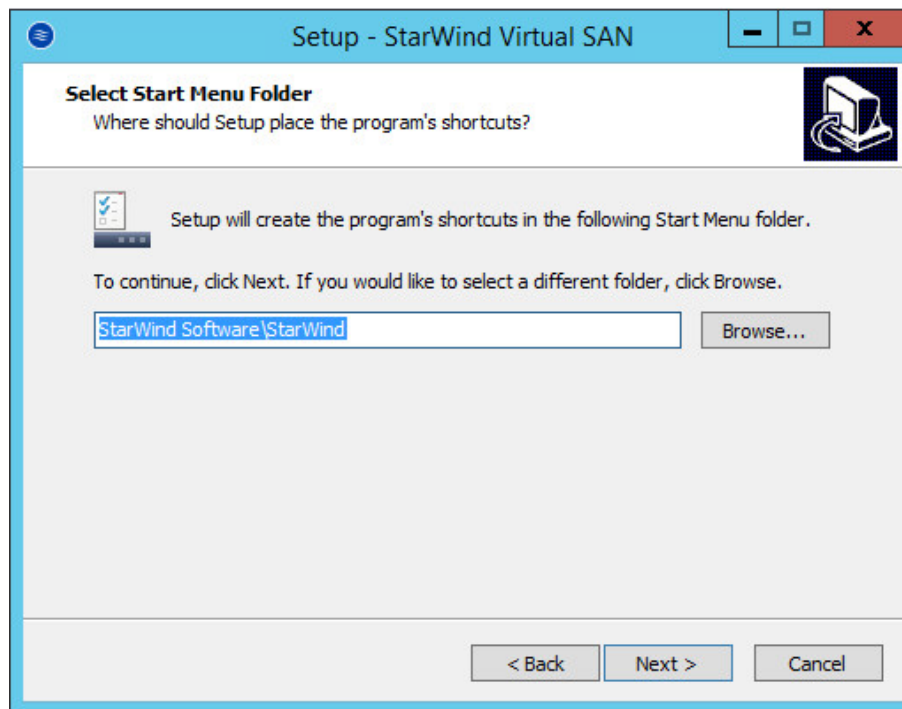
Click **Next** to continue.

15.   Enable the checkbox if you want to create a desktop icon.
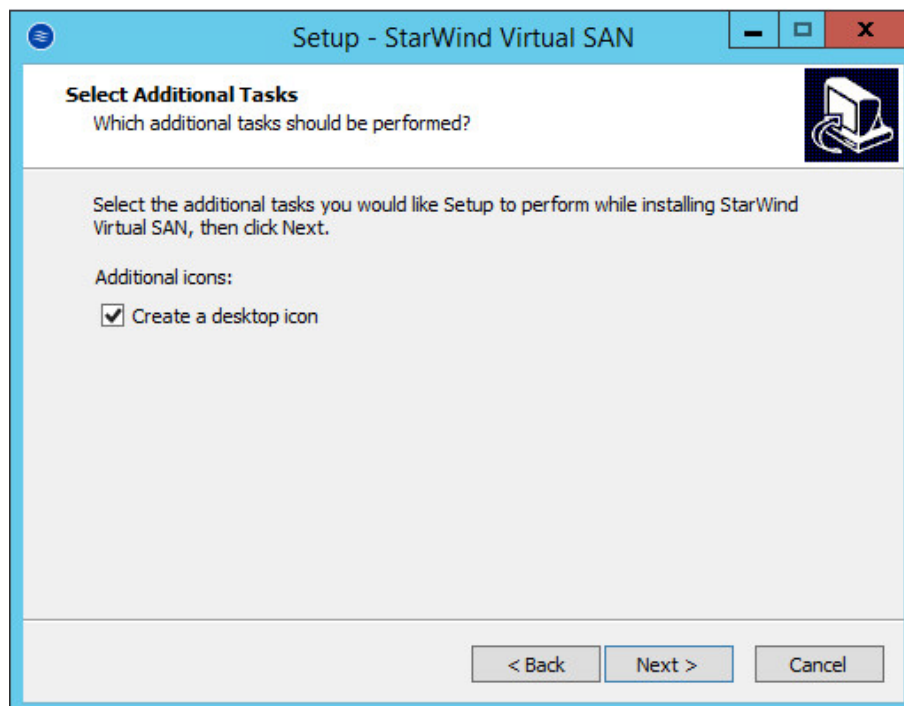
Click **Next** to continue.

16. You will be prompted to request a time-limited fully functional evaluation key, or a FREE version key, or a fully commercial license key sent to you with the purchase of **StarWind Virtual SAN**. Select the appropriate option.

Click **Next** to continue.

17. Click **Browse** to locate the license file.
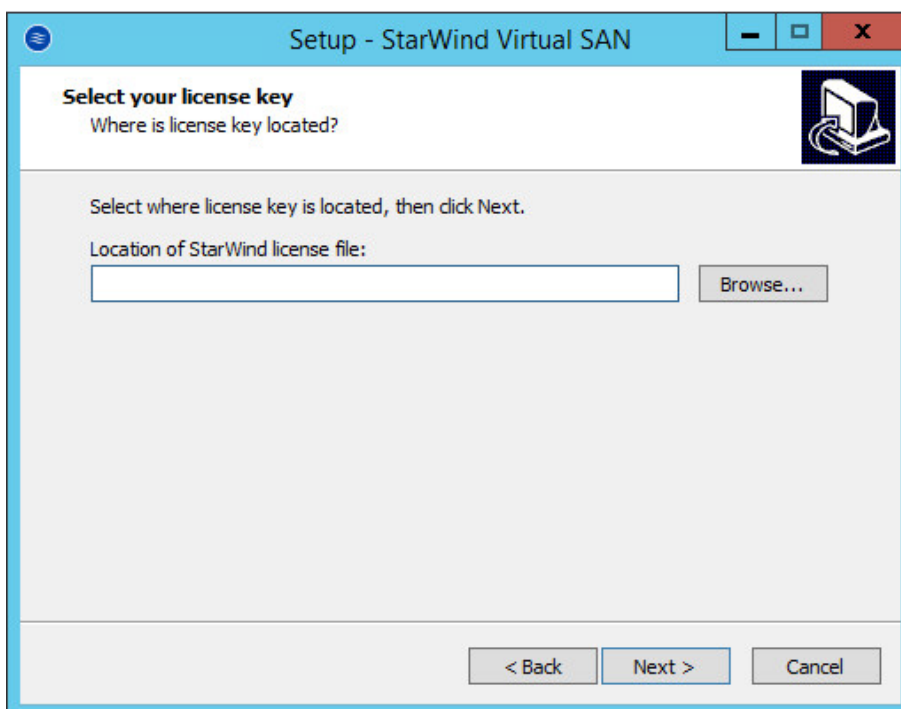
Click **Next** to continue.

18.   Review the licensing information.
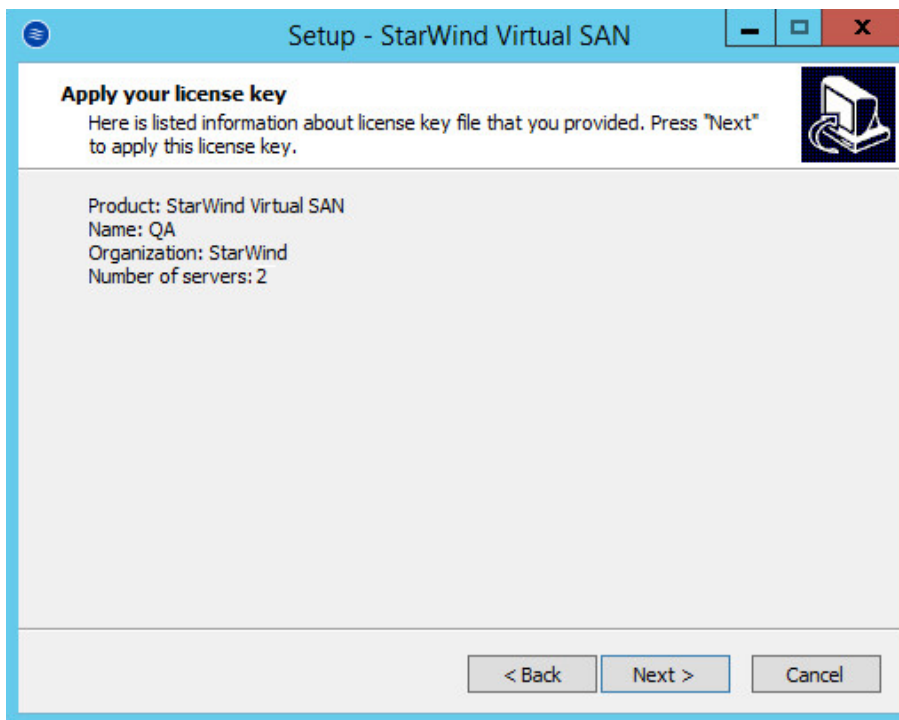
Click **Next** to apply the license key.

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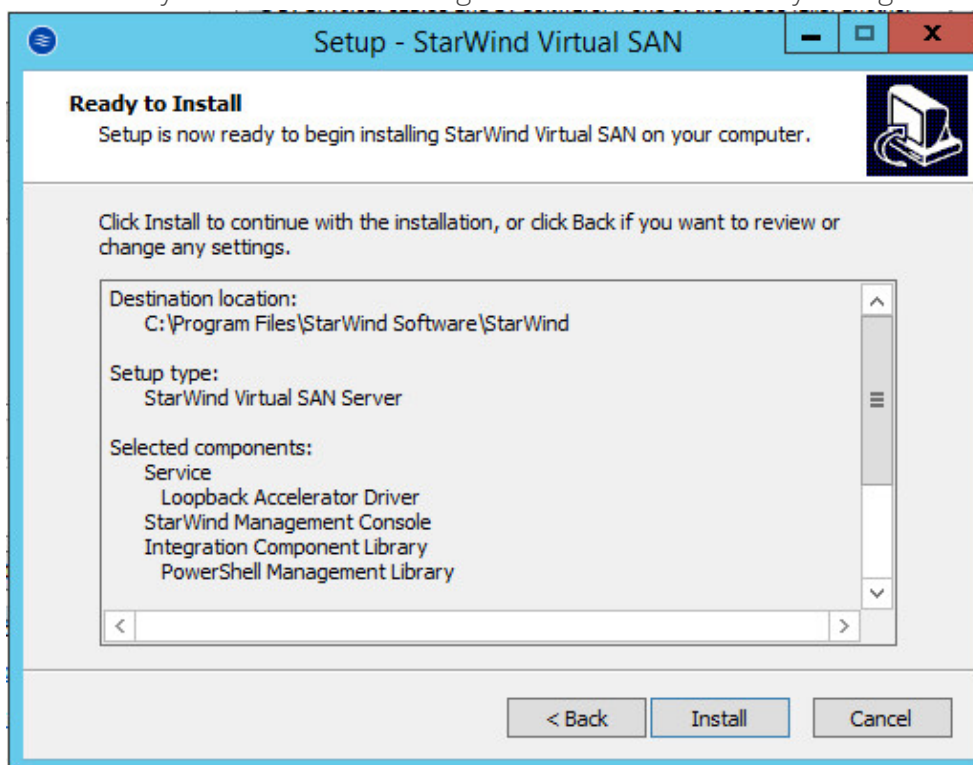
Click **Install** to continue.

20. Select the appropriate checkbox to launch the **StarWind Management Console** immediately after setup wizard is closed.
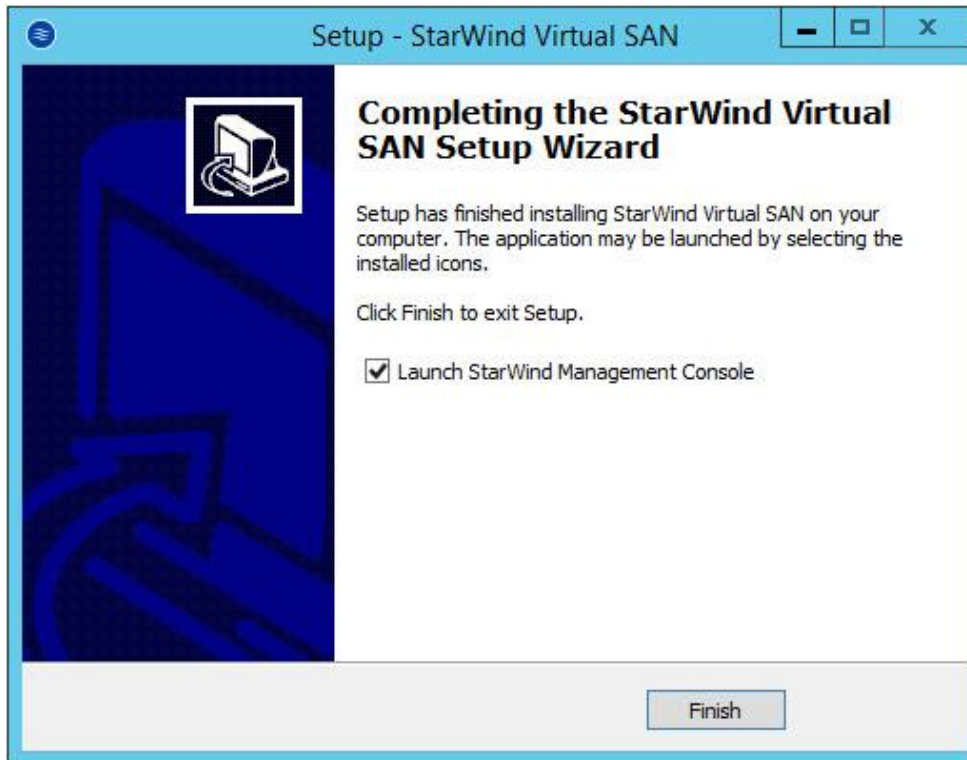
Click **Finish** to close the wizard.

Repeat steps 2 to 12 on the partner node.

NOTE: To manage **StarWind Virtual SAN** installed on a Server Core OS edition, StarWind Management console should be installed on a different computer running the GUI-enabled Windows edition.

Configuring Shared Storage

21.   Launch the **StarWind Management Console:** double-click the StarWind tray icon.

NOTE: StarWind Management Console cannot be installed on an operating system without a GUI. You can install it on any of the GUI-enabled Windows Editions including the desktop versions of Windows.
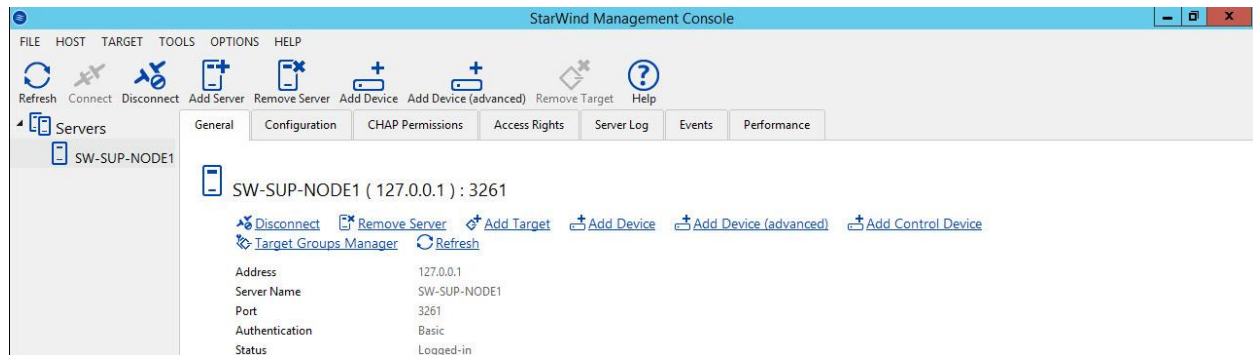
If **StarWind Service** and **Management Console** are installed on the same server, the **Management Console** will automatically add the local StarWind instance to the Console tree after the first launch. Then, the **Management Console** automatically connects to it using the default credentials. To add remote StarWind servers to the console, use the **Add Server** button on the control panel.

22.   StarWind Management console will ask you to specify the default storage pool on the server you're connecting to for the first time. Please configure the default storage pool to use one of the volumes you have prepared earlier. All the devices created through the Add Device wizard will be stored on it. Should you decide to use an alternative storage path for your StarWind virtual disks, please use the **Add Device (advanced)** menu item.

Press **Yes** button to configure the storage pool. Should you require to change the storage pool destination, press **Choose path...** and point the browser to the necessary disk.

NOTE: Each of the arrays which will be used by **StarWind Virtual SAN** to store virtual disk images should meet the following requirements:

- initialized as GPT

- Have a single NTFS-formatted partition

- Have a drive letter assigned

23. Select the StarWind server where you wish to create the device.

24. Press the **Add Device (advanced)** button on the toolbar.

25. Add Device Wizard will appear. Select Hard Disk Device and click Next.

26. Select Virtual disk and click Next.

27. Specify the virtual disk location, name and size.

Click **Next.**

28.   Specify virtual disk options.
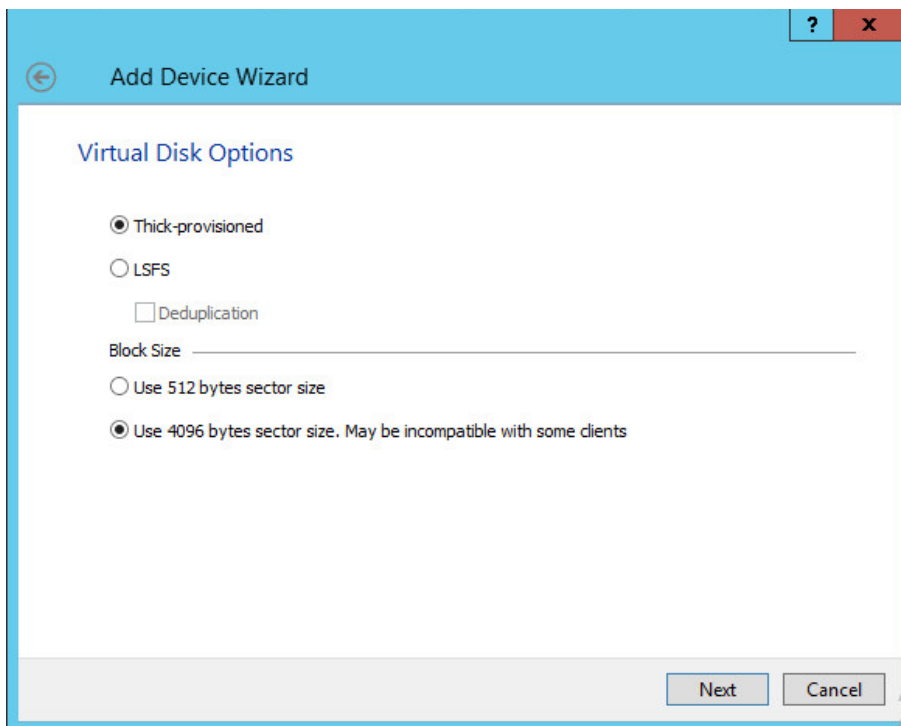
Click **Next**.

29.   Define the caching policy and specify the cache size (in MB).
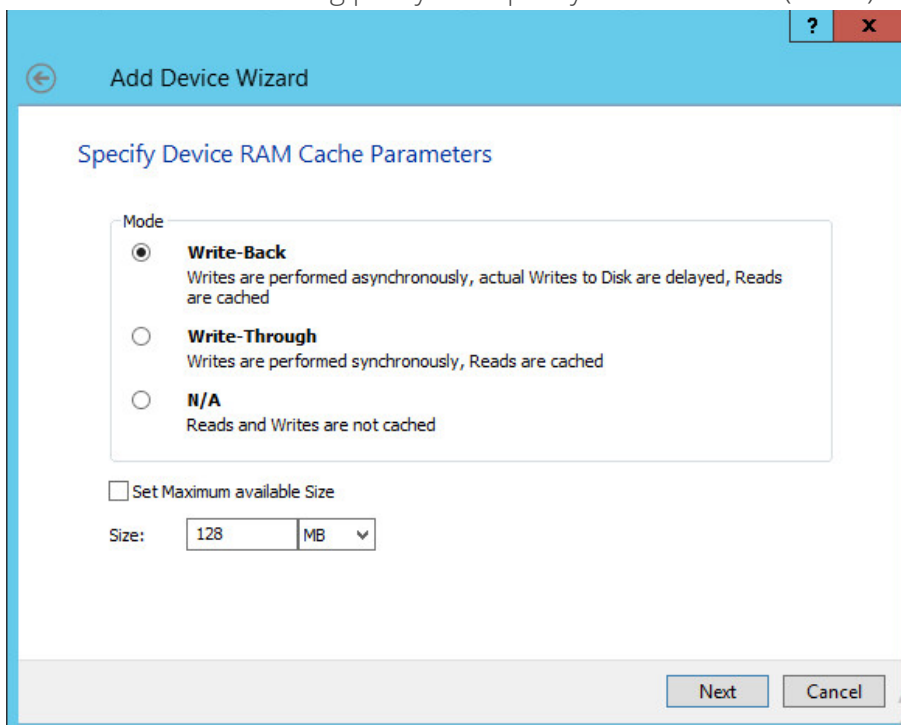
Click **Next.**

30.   Define the **Flash Cache Parameters** and size if necessary. Choose SSD location in the wizard.

Click **Next** to continue.

NOTE: It is recommended to put 1 GB of L1 cache in write-back mode per 1 TB storage capacity. The recommended size of L2 cache is 10% of initial StarWind device size.

31. Specify target parameters.

Select the **Target Name** checkbox to customize the target name.
Otherwise, the name will be generated automatically basing on the target alias.

Click **Next** to continue.

32. Click **Create** to add a new device and attach it to the target. Then click **Close** to close the wizard.

33. Right-click on the servers field and click **Add Server** button. Add new StarWind Server, which will be used as the second HA node.

Click **OK** and **Connect** button to continue.

34. Right-click on the device you have just created and select **Replication Manager.**
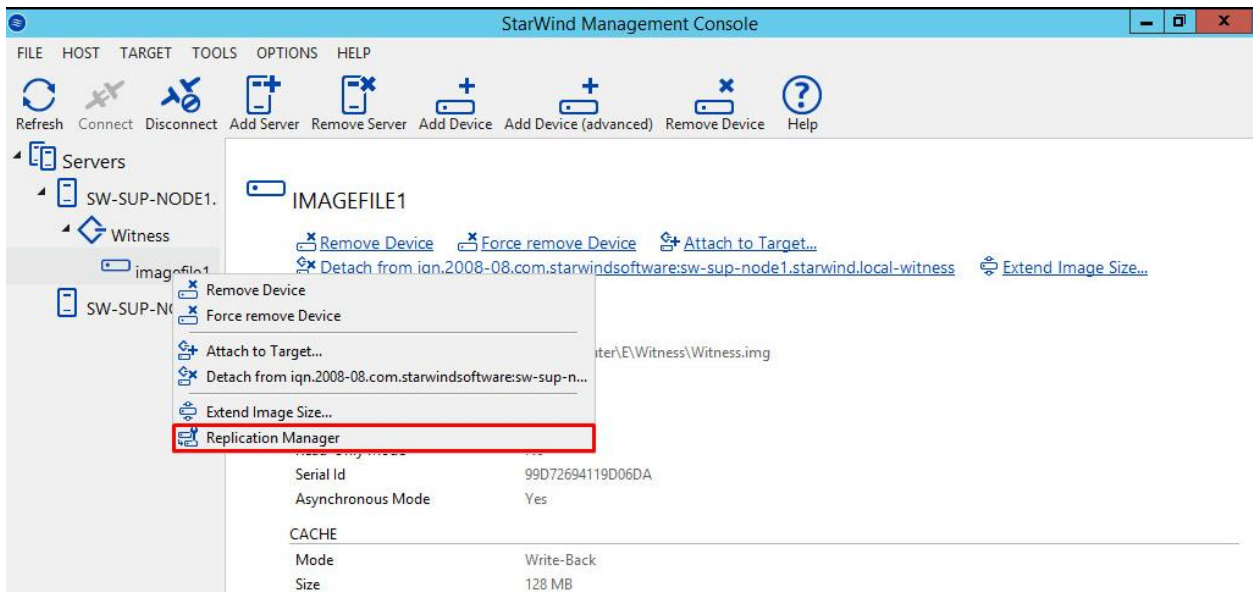
Replication Manager Window will appear. Press the **Add Replica** button.
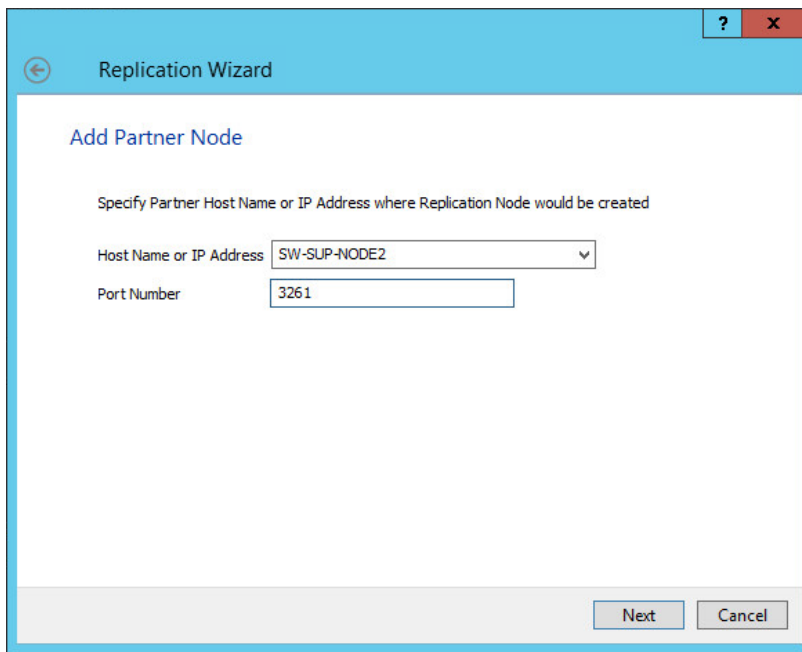
35. Select Synchronous two-way replication.
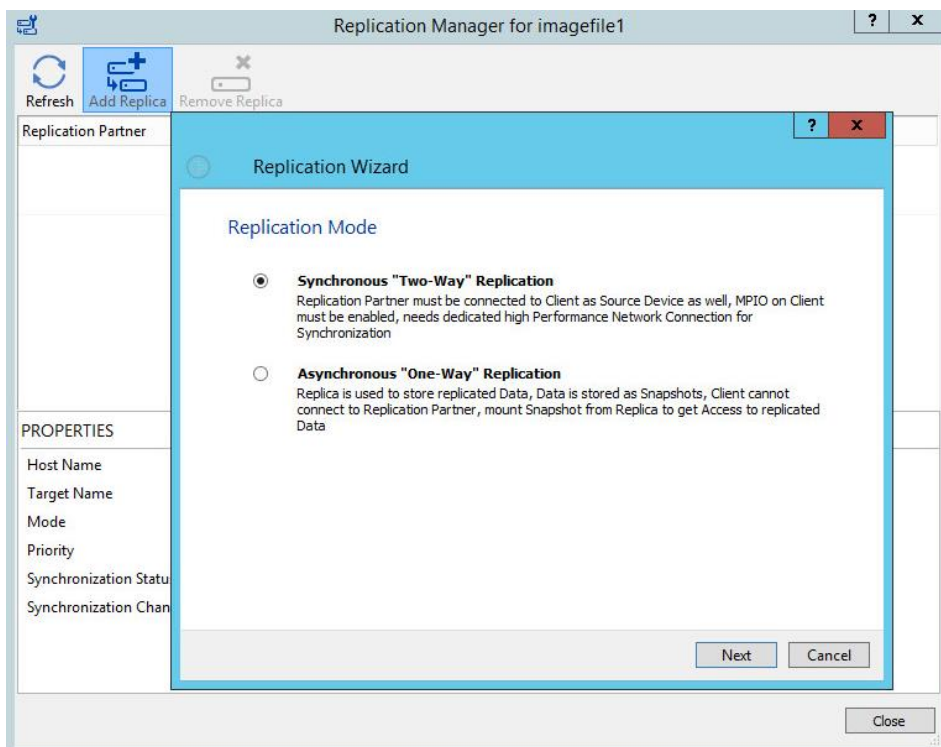
Click **Next** to proceed.

36.   Specify the partner server IP address.
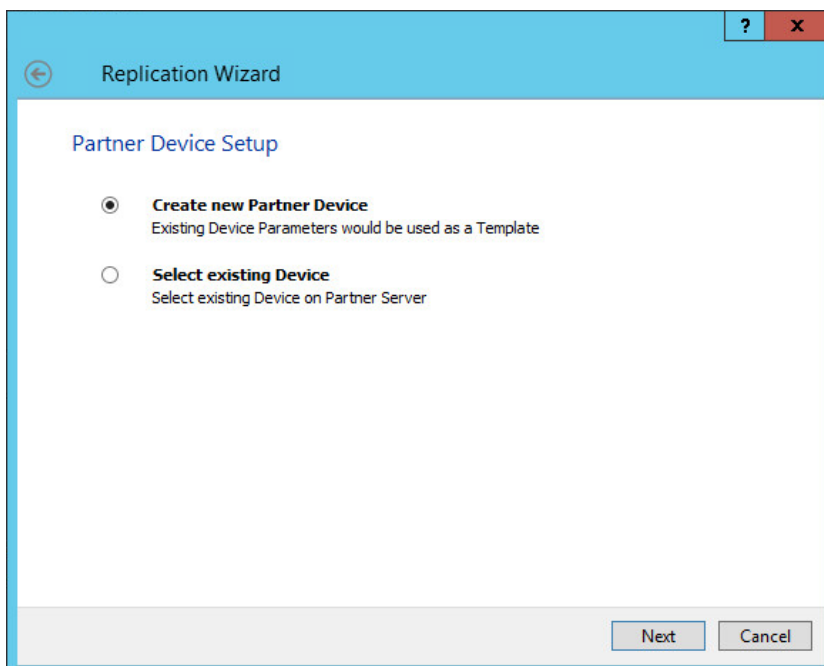
Default StarWind management port is 3261. If you have configured a different port, please type it in the **Port number** field.

Click **Next**.

37.   Choose Create new Partner Device

Click **Next**.

38. Specify partner device location if necessary. You can also modify the target name of the device.
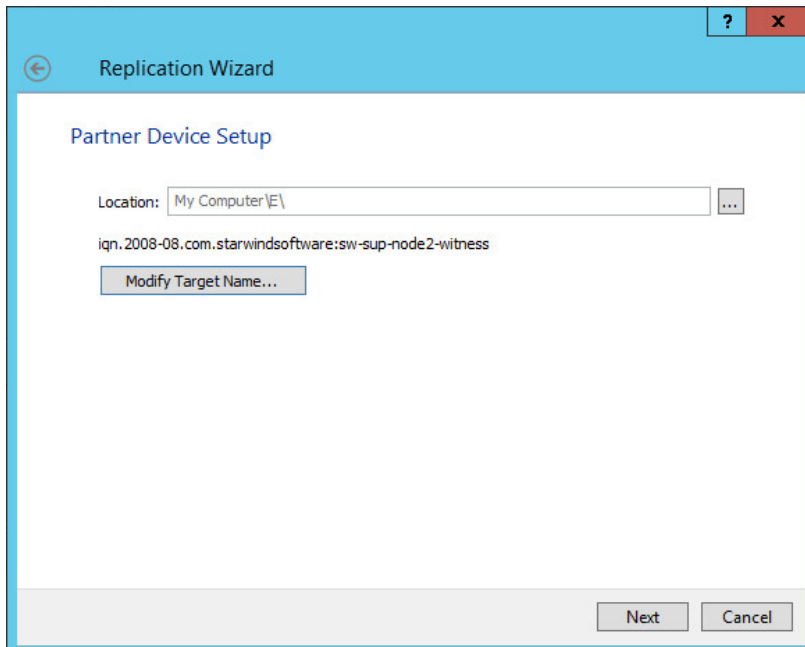
Click **Next**.

39. On this screen you can select the synchronization and heartbeat channels for the HA device. You can also modify the ALUA settings.
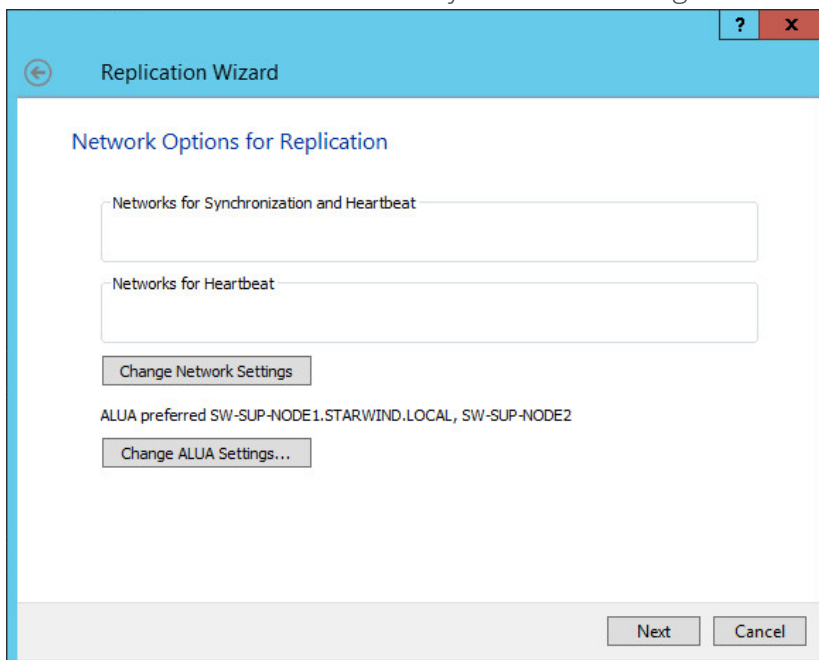
Click **Change network settings.**

40. Specify the interfaces for synchronization and Heartbeat.
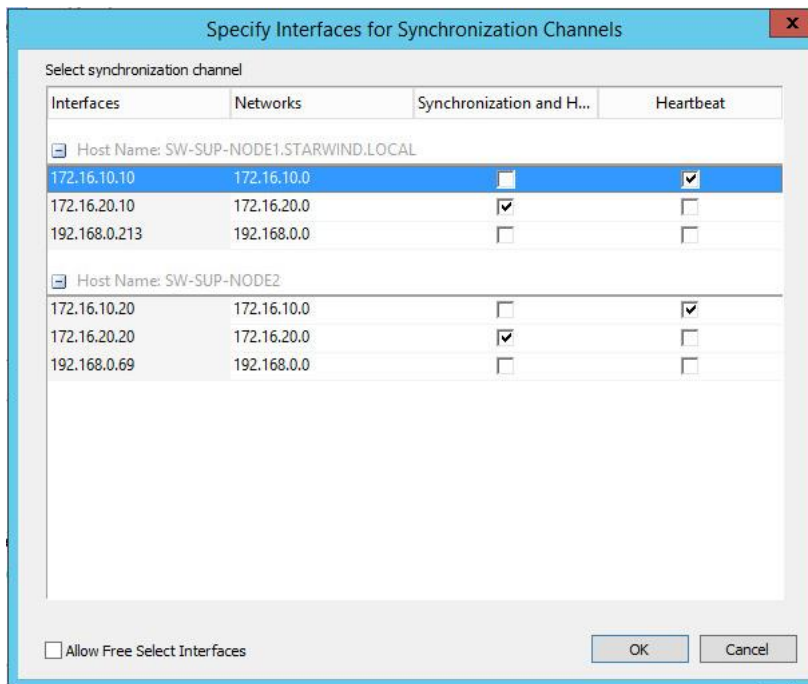
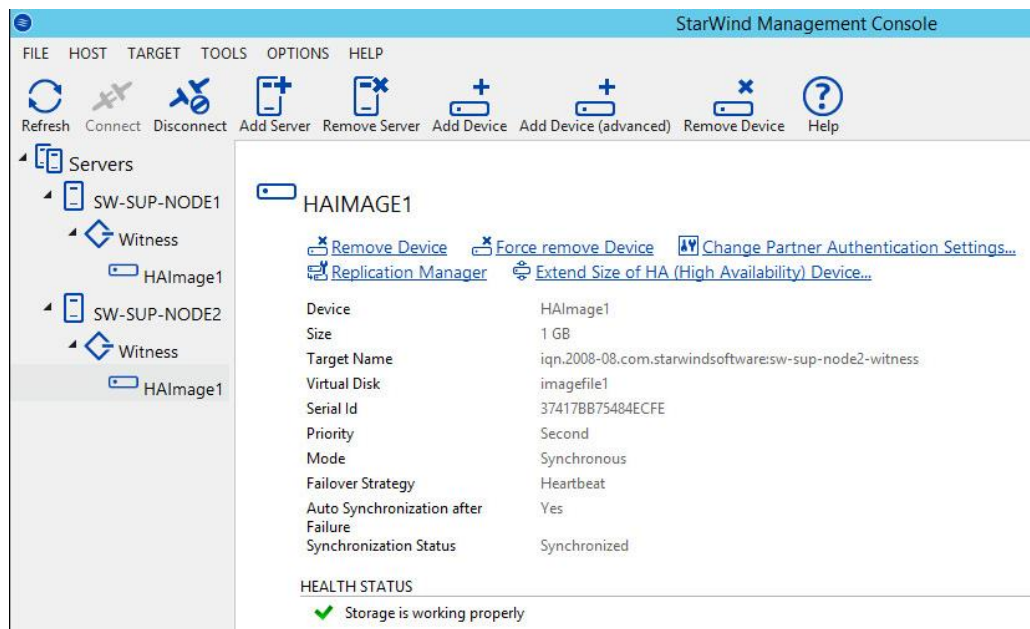Click **OK**. Then click **Next.**

41. Select partner device initialization mode **Synchronize from existing Device**.
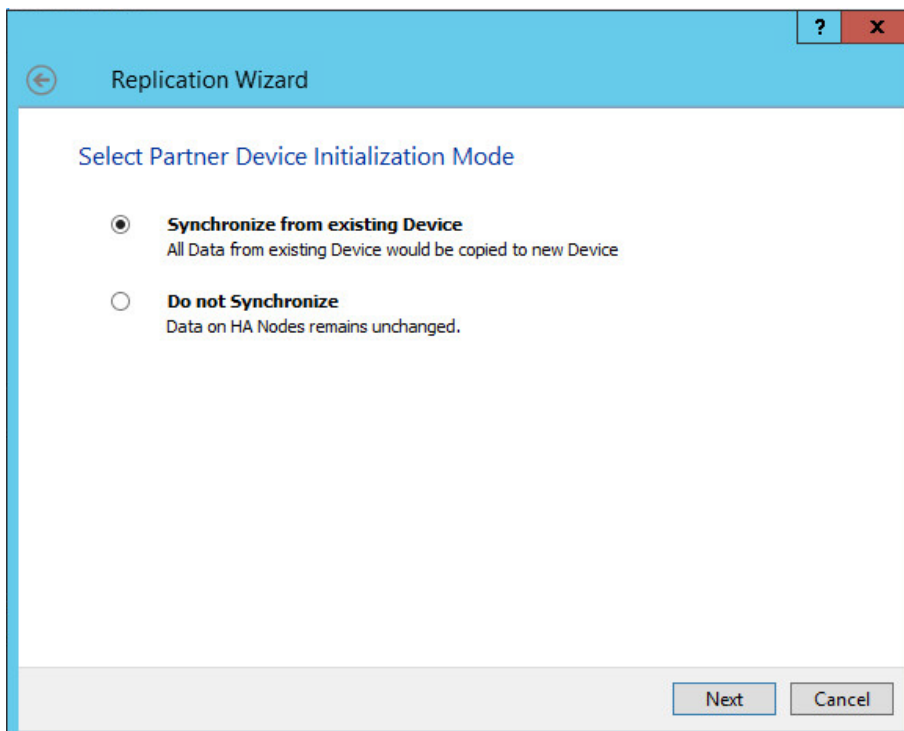
Click **Next**.

42.   Press the **Create Replica** button. Then click **Close** to close the wizard.

43.   The added devices will appear in the **StarWind Management Console**.

Repeat steps 3 – 23 for the remaining virtual disks that will be used as Cluster Shared Volumes.

Once all devices are created, the Management console should look as follows:
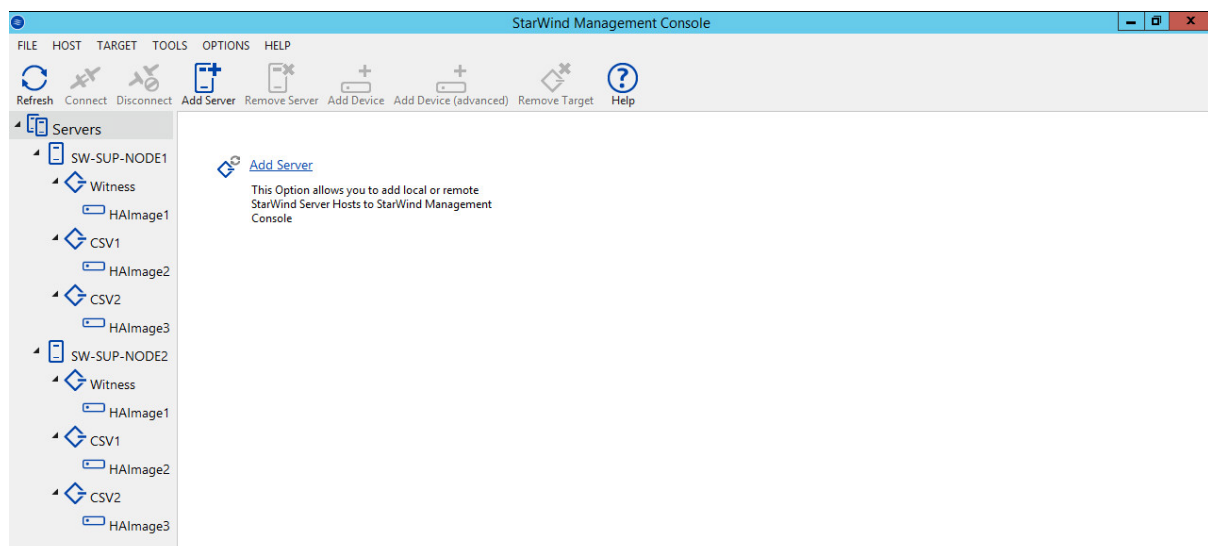
Discovering Target Portals

In this chapter, we will connect the previously created disks to the servers which will be added to the cluster:

44.   Launch Microsoft iSCSI Initiator: Start > Administrative Tools > iSCSI Initiator or iscsicpl from the command line interface. The iSCSI Initiator Properties window appears.

45.   Navigate to the **Discovery** tab.

46.   Click the **Discover Portal** button. Discover Target Portal dialog appears. Type in 127.0.0.1.
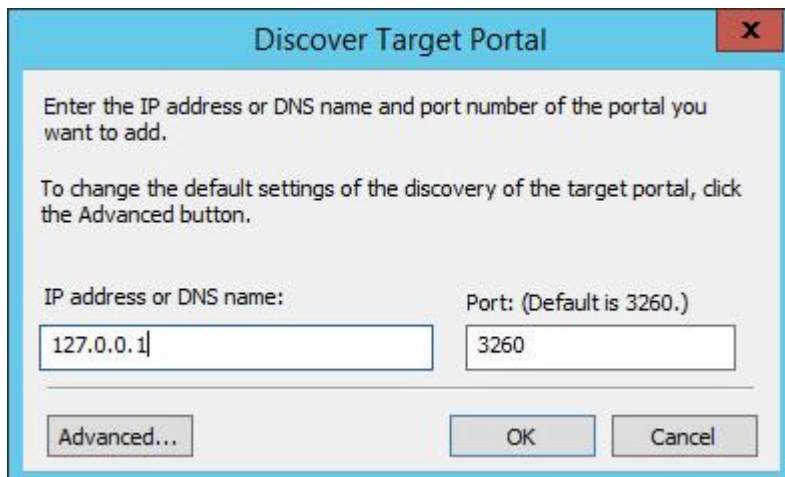
Click the **Advanced** button. Select **Microsoft ISCSI Initiator** as your **Local adapter** and select your **Initiator IP** (leave default for 127.0.0.1).
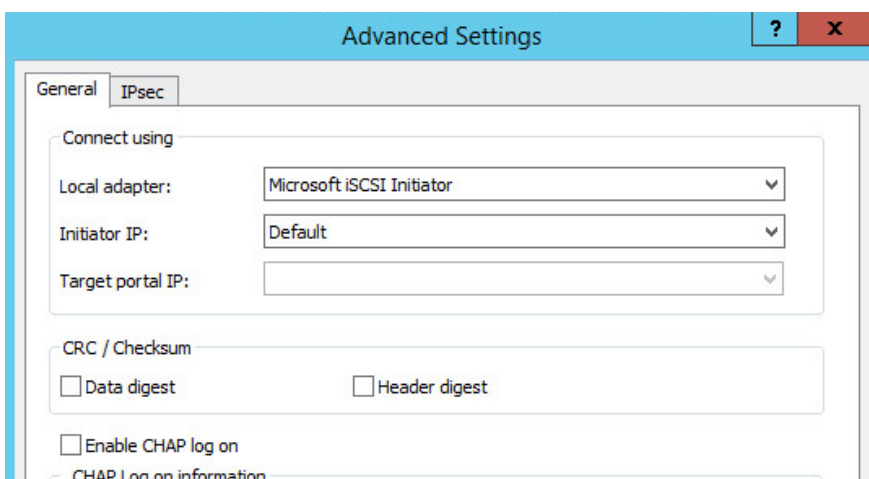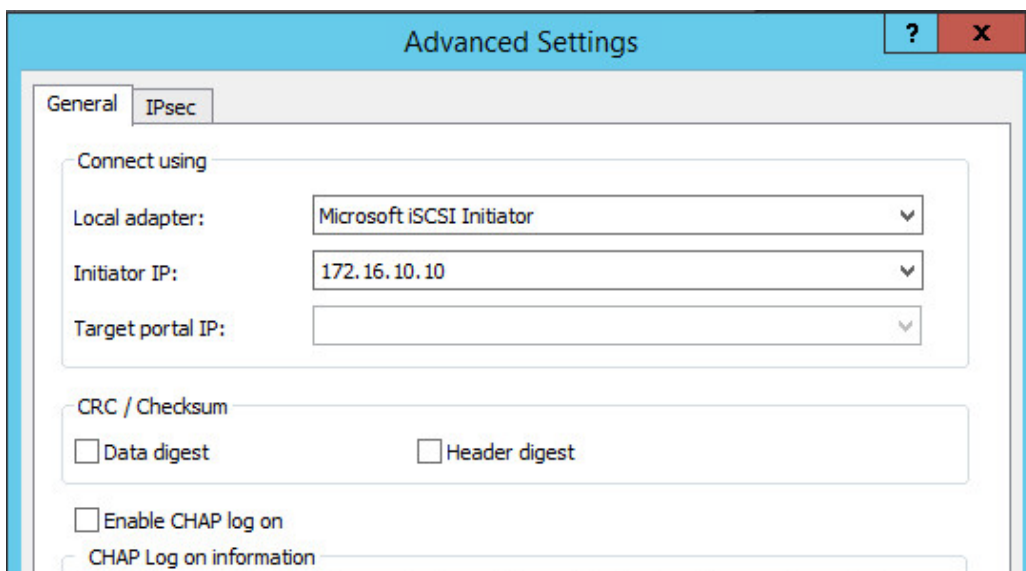

Click **OK.** Then click **OK** again to complete the Target Portal discovery.

47. Click the **Discover Portal**… button again.

48. Discover Target Portal dialog appears. Type in the first IP address of the partner node you will use to connect the secondary mirrors of the HA devices.
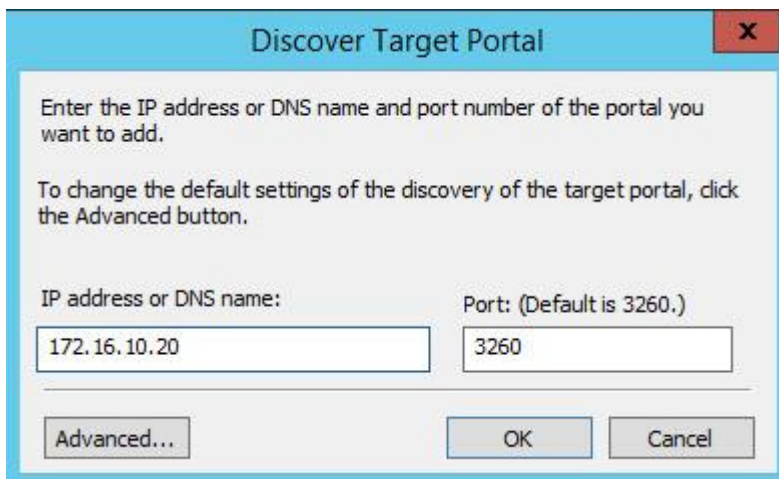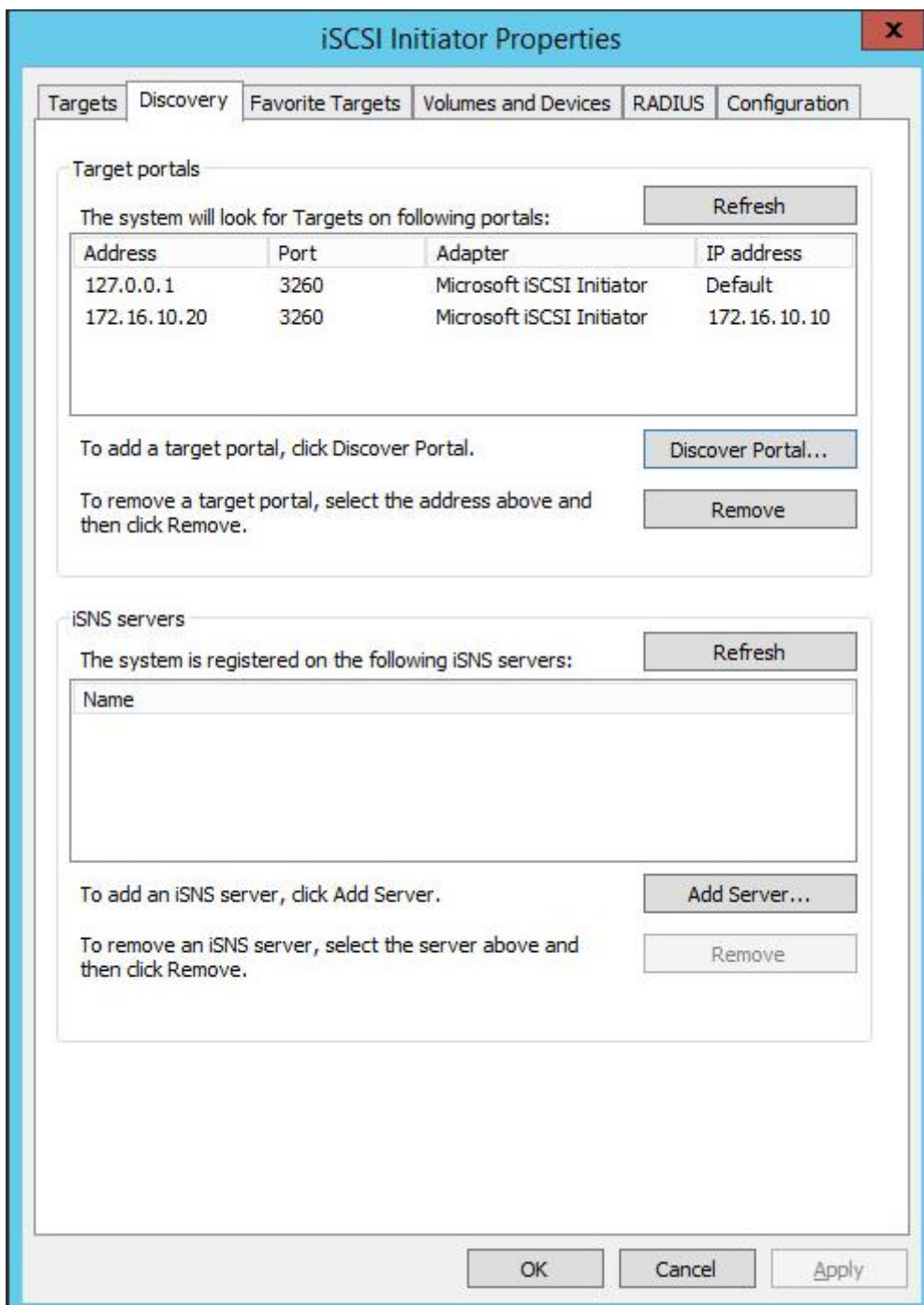

Click **Advanced.**

49. Select **Microsoft ISCSI Initiator** as your **Local adapter**, select the **Initiator IP** in the same subnet as the IP address of the partner server from the previous step.
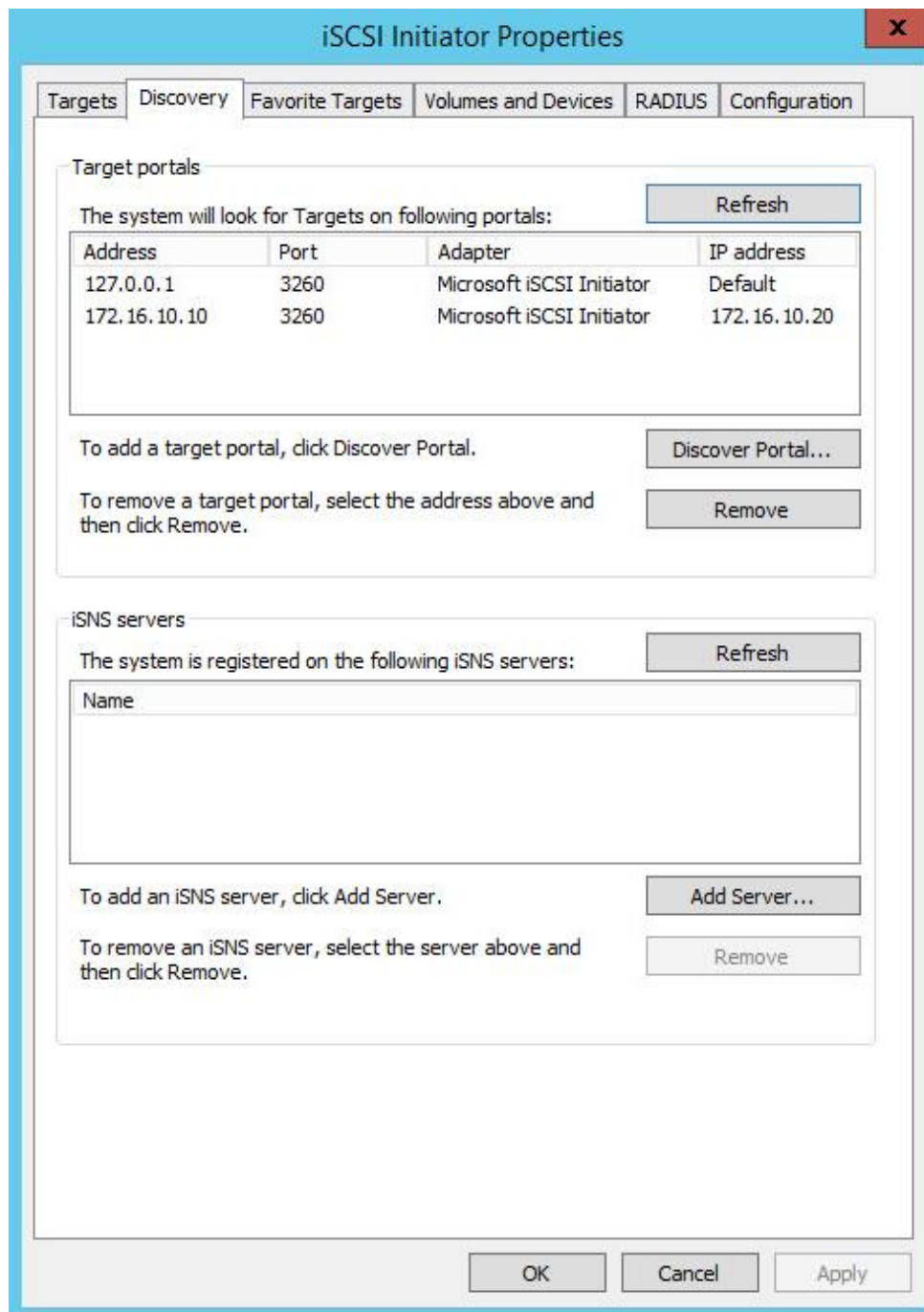

Click **OK.** Then click **OK** again to complete the Target Portal discovery.

Now all target portals are added on the first node.

50. Go through the same steps for the second node.

51.   All target portals are added on the second node.

Connecting Targets

52.   Click the **Targets** tab. The previously created targets are listed in the **Discovered Targets** section.

NOTE: If the created targets are not listed, check the firewall settings of the StarWind Server as well as the list of networks served by the StarWind Server (go to **StarWind Management Console -> Configuration -> Network)**.
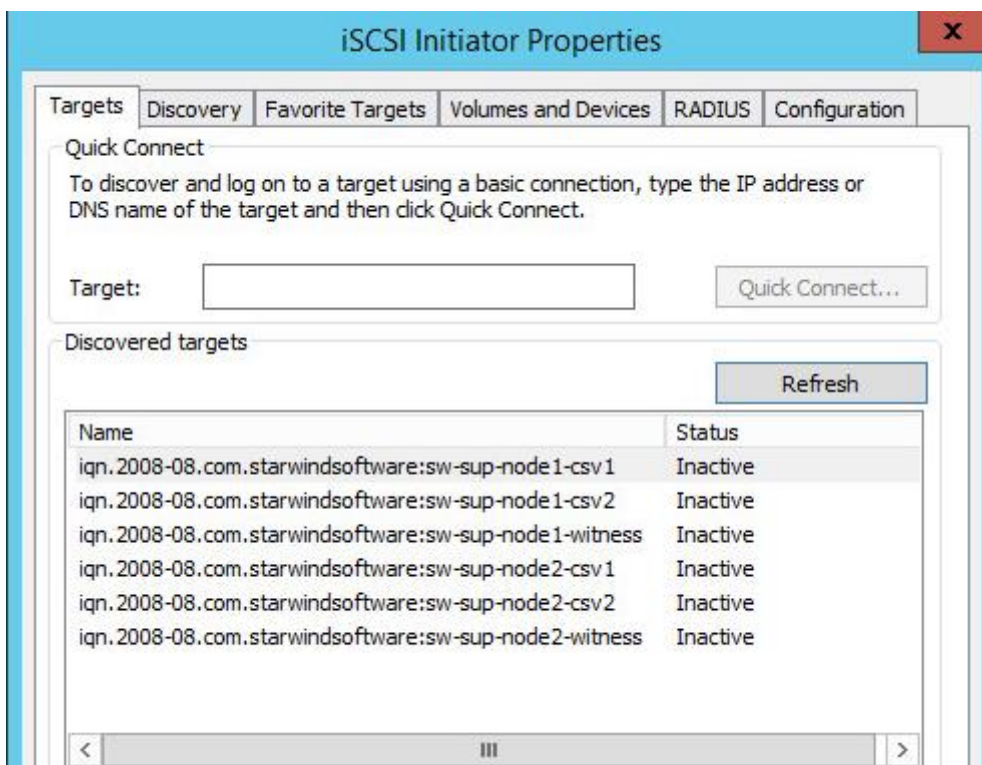
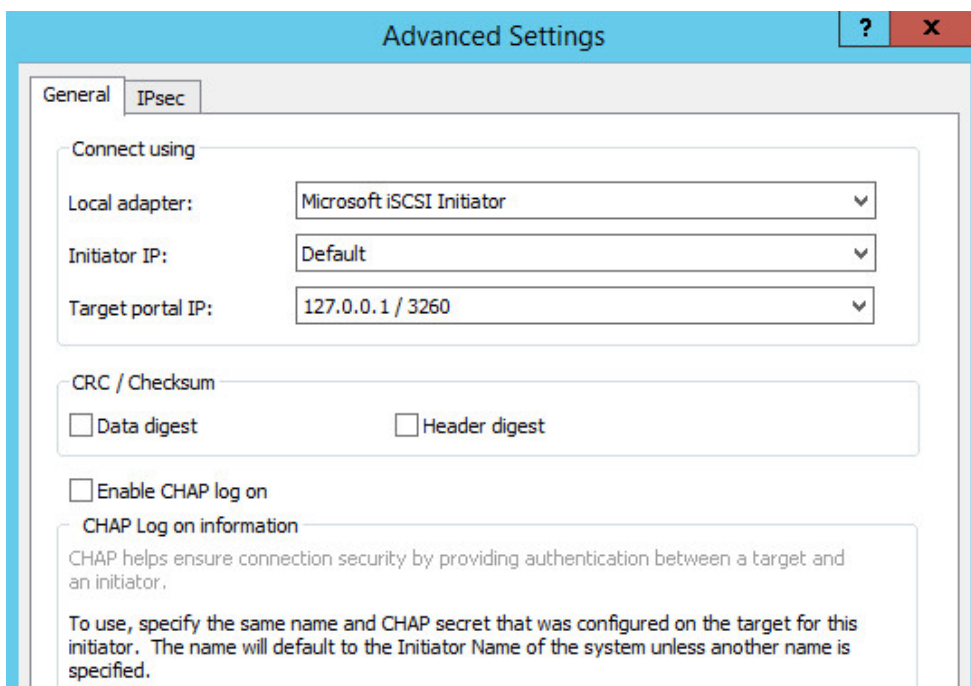53.   Select a target of witness located on the local server and click **Connect**.

54. Enable checkboxes as on the image below.
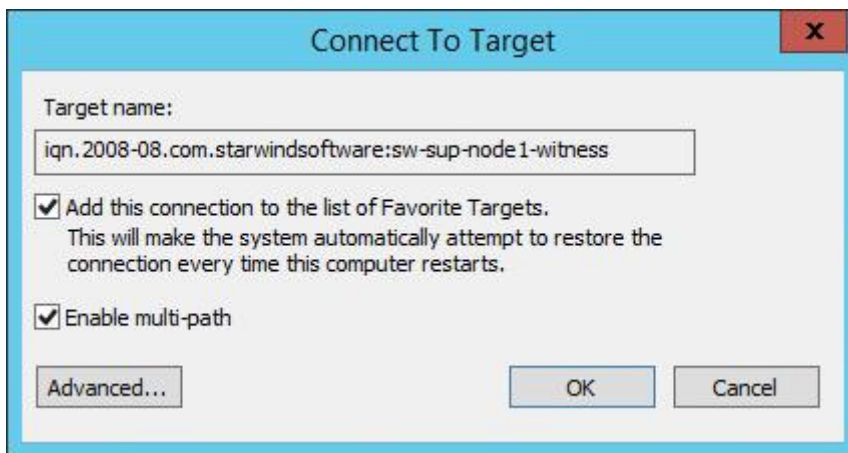
Click **Advanced.**

55. Select Microsoft iSCSI Initiator in the Local adapter text field.

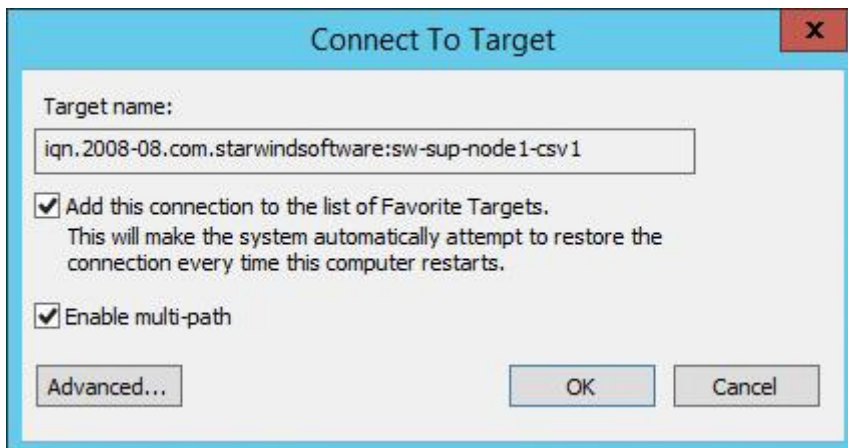Select 127.0.0.1 in the **Target portal IP**.

Click **OK.** Then click **OK** again.

Do not connect the partner-target for **Witness** device from the other StarWind node.

56. Select another target located on the local server and click **Connect**.

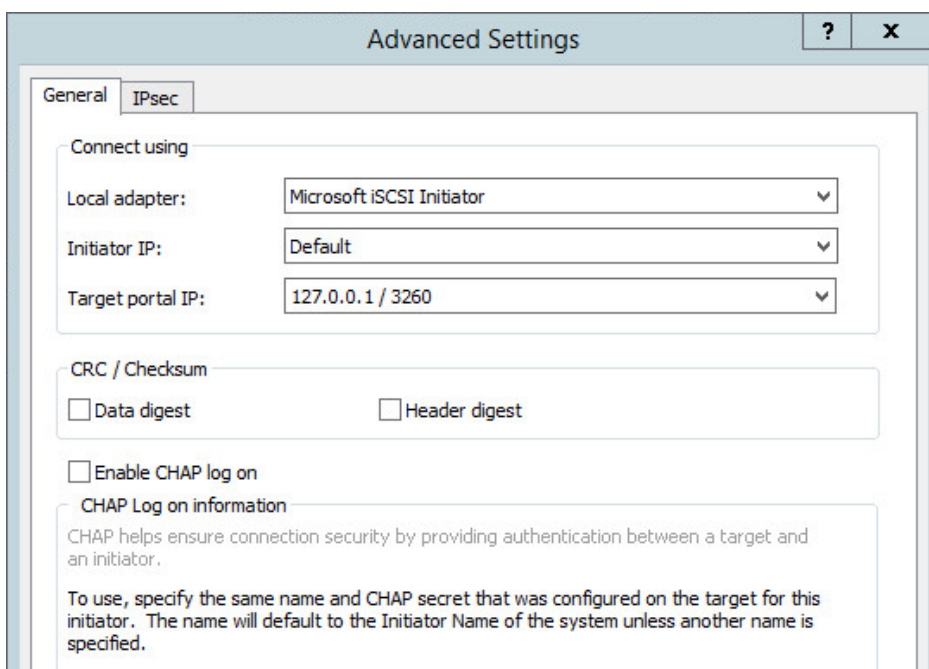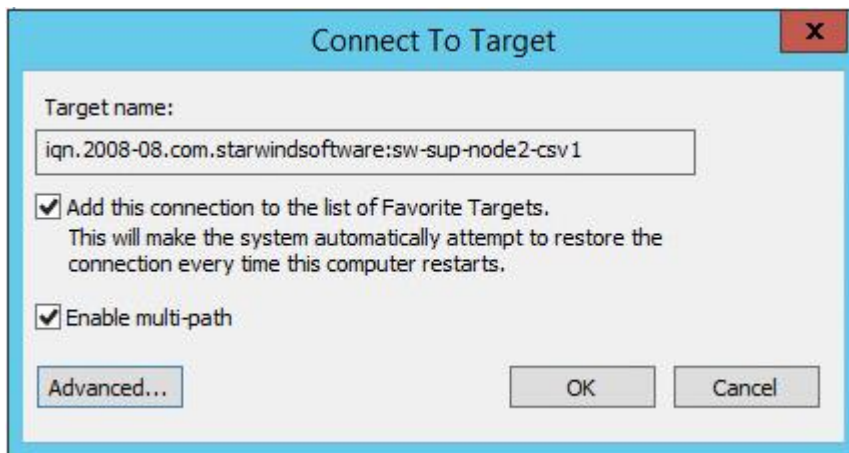57. Enable checkboxes as on the image below.

Click **Advanced**.

58.	Select Microsoft iSCSI Initiator in the Local adapter text field.

Select 127.0.0.1 in the **Target portal IP**.

Click **OK**. Then click **OK** again.

59.	Select the partner-target from the other StarWind node and click Connect.
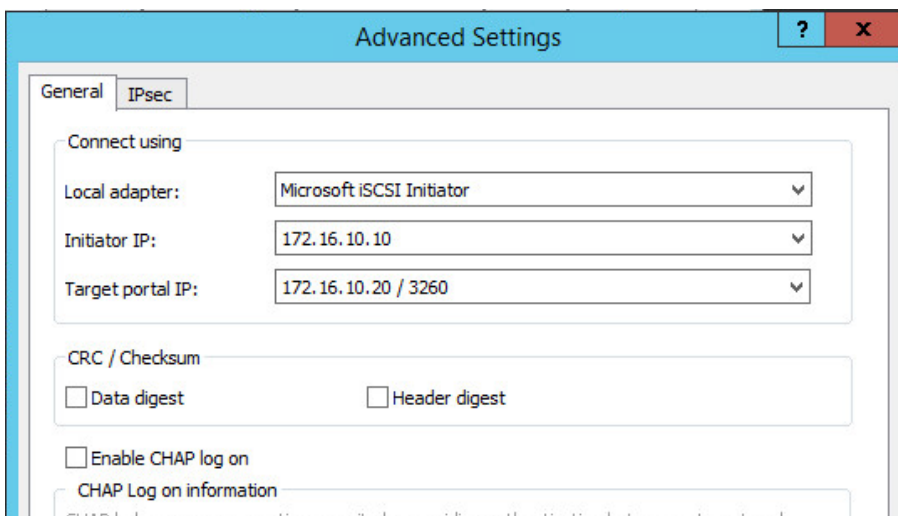
60.   Enable checkboxes as on the image below.

Click **Advanced.**

61.   Select Microsoft iSCSI Initiator in the Local adapter text field. In the **Initiator IP** field select the IP address for ISCSI channel. In the **Target portal IP** select the corresponding portal IP from the same subnet.
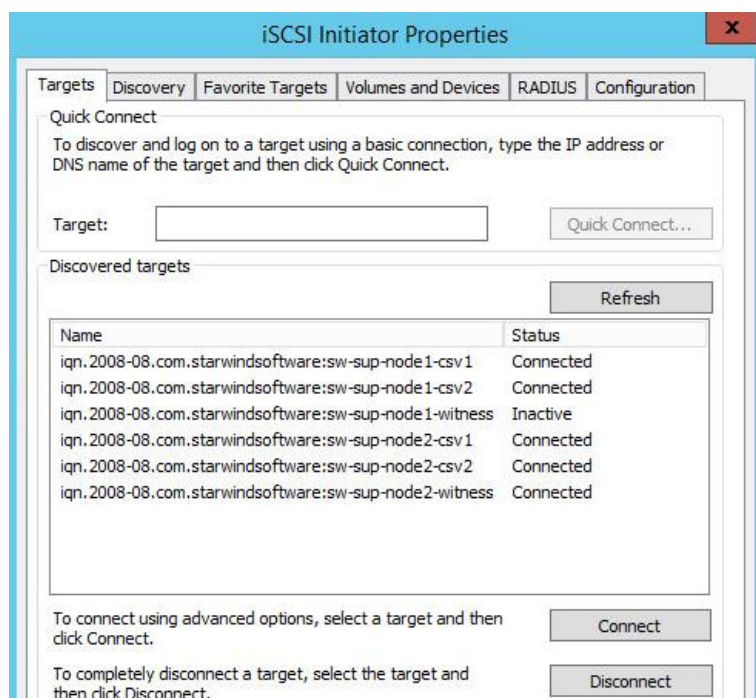

Click **OK**. Then click **OK** again.

62. Repeat actions described in the steps above for all HA devices. The result should look like the screenshot below.
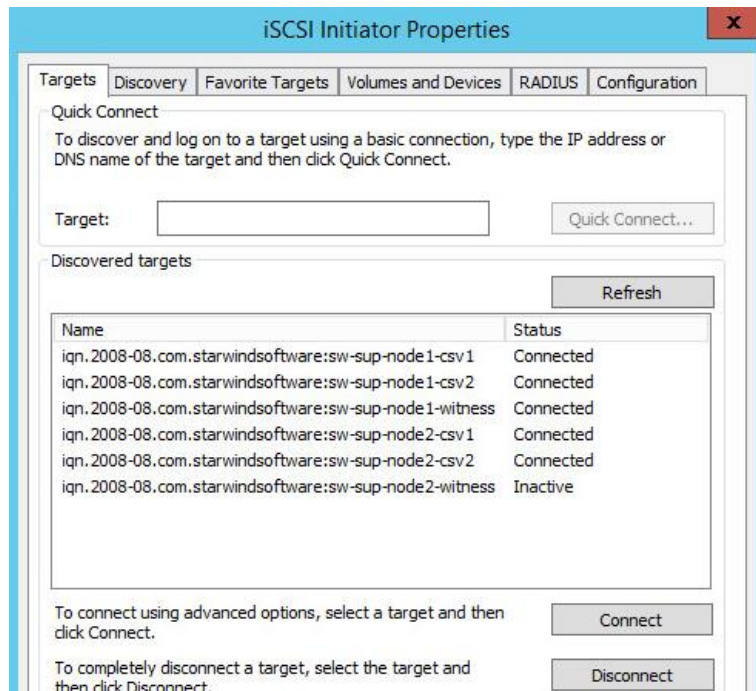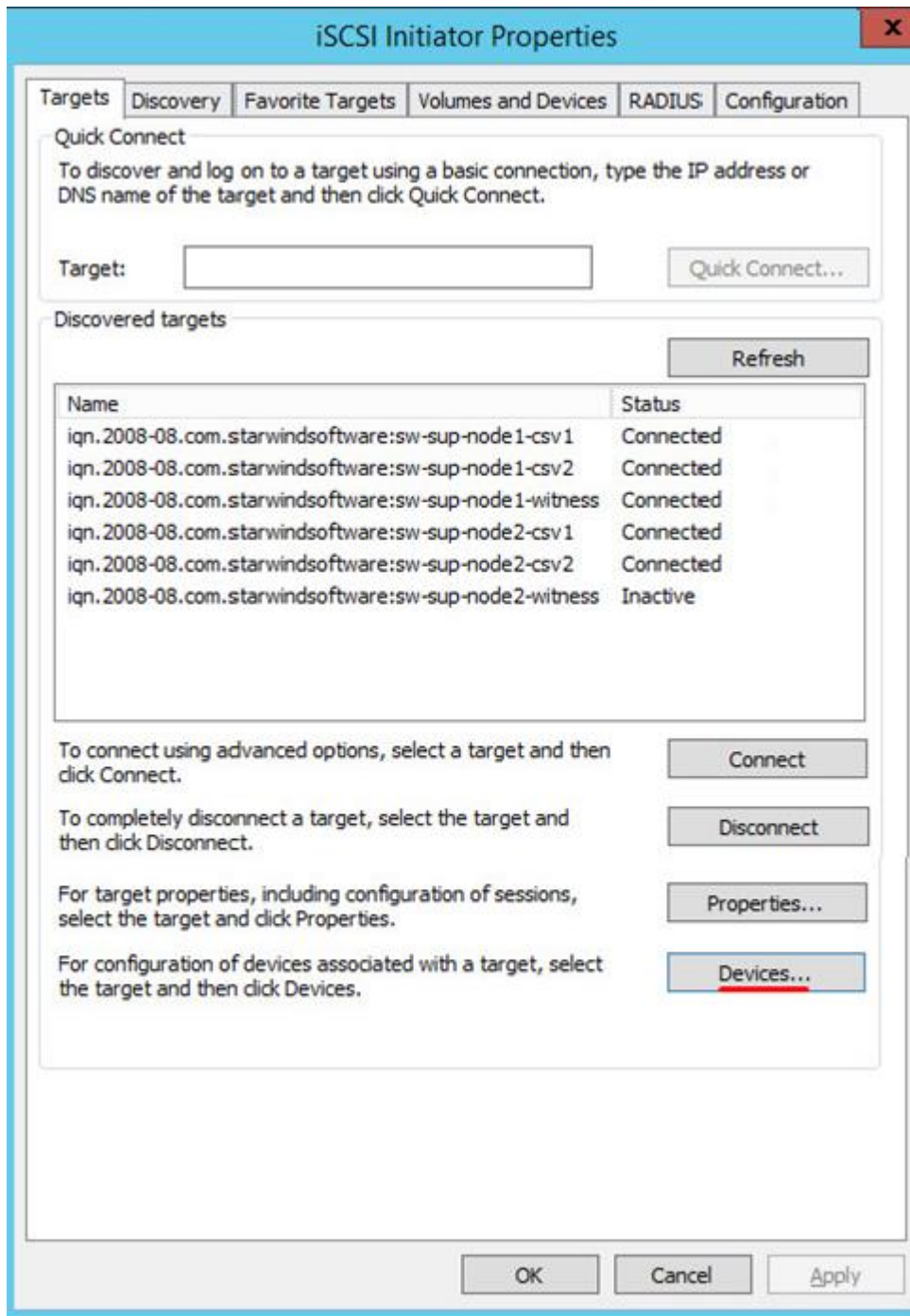

63. Repeat all the steps of this section on the second StarWind node, specifying corresponding local and data channel IP addresses. The result should look like the screenshot below.
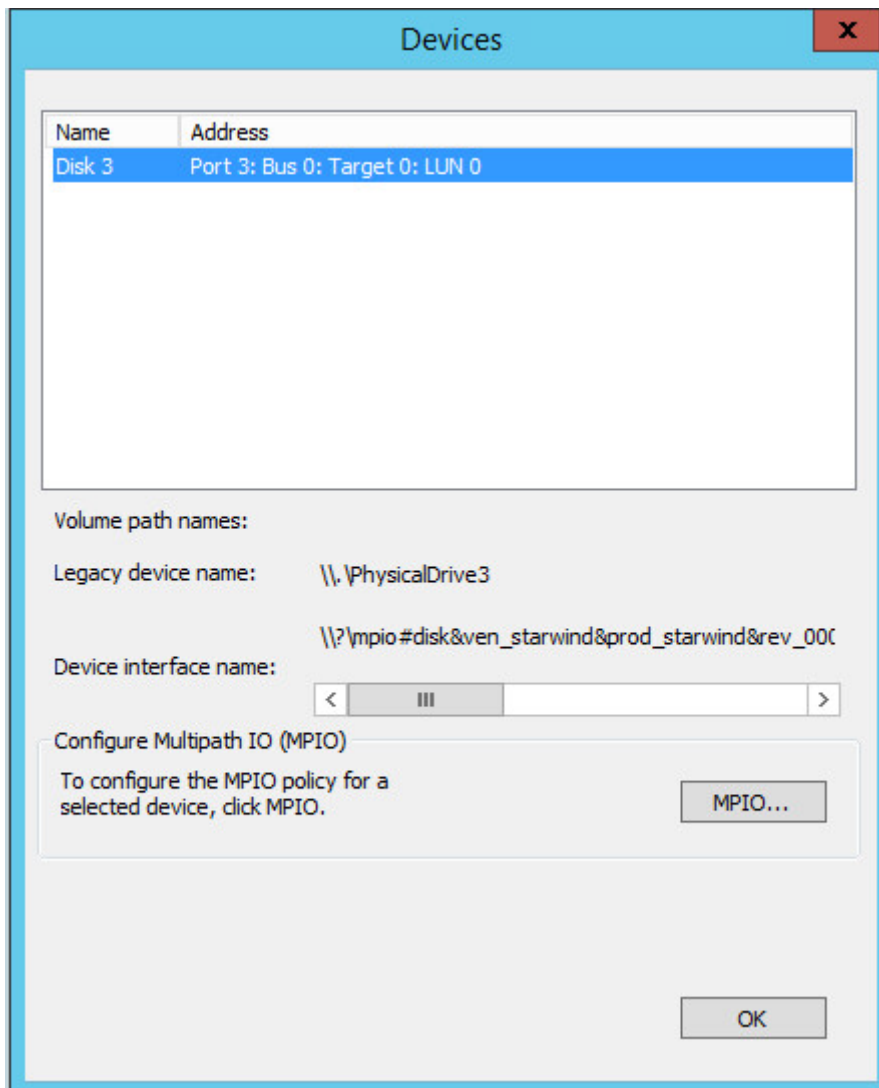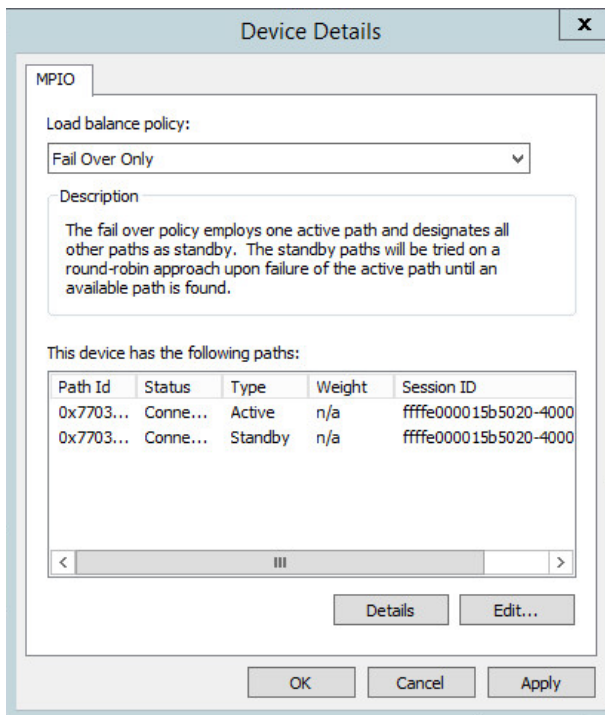
Multipath Configuration

64.   Configure the MPIO policy for each device, specifying localhost (127.0.0.1) as the active path. Select a target located on the local server and click **Devices**.
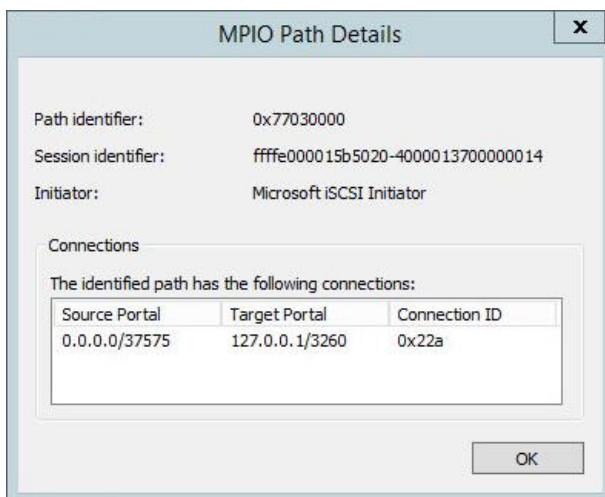
65. Devices dialog appears. Click **MPIO**.

66.   Select **Fail Over Only** load balance policy, and then designate the local path as active.

67.   You can check that 127.0.0.1 is the active path by selecting it from the list and clicking **Details**.


68.   Repeat the same steps for each device on the current and the second node.

69.   Initialize the disks and create partitions on them using the **Disk Management** snap-in. The disk devices are required to be visible on both nodes in order to create the cluster.
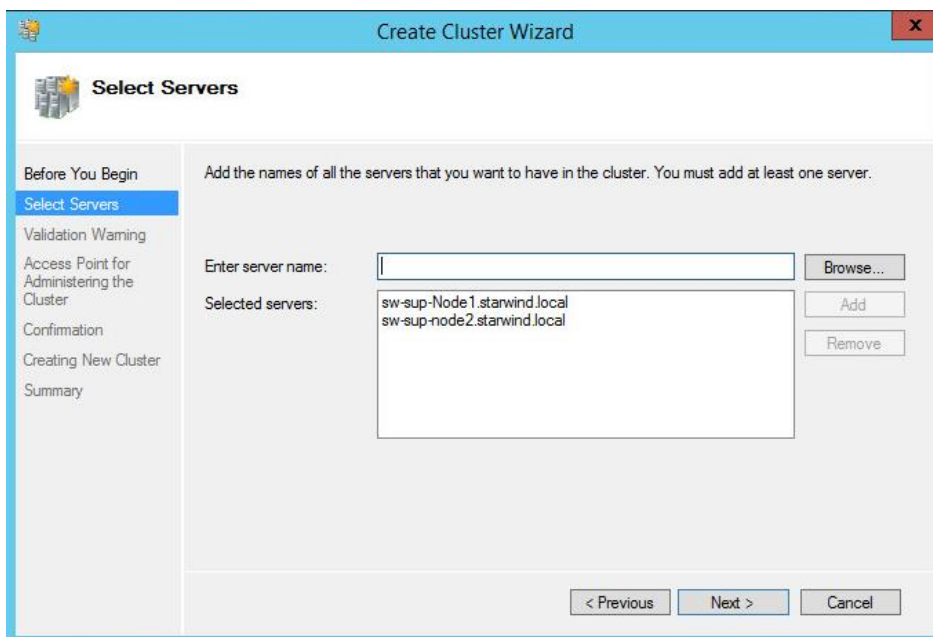
NOTE: it is recommended to initialize the disks as GPT.

Creating a Cluster

70.   Open **Server Manager**. Select the **Failover Cluster Manager** item from the **Tools** menu.
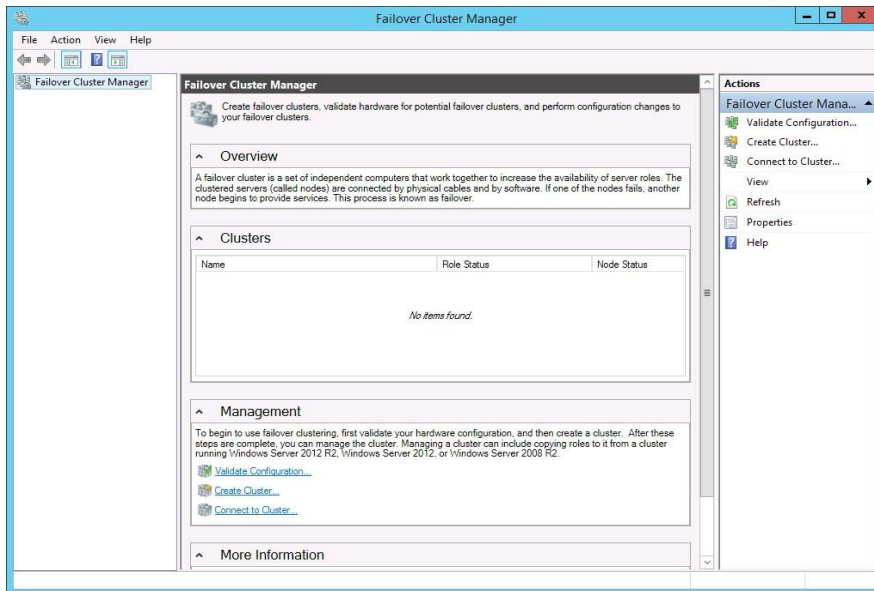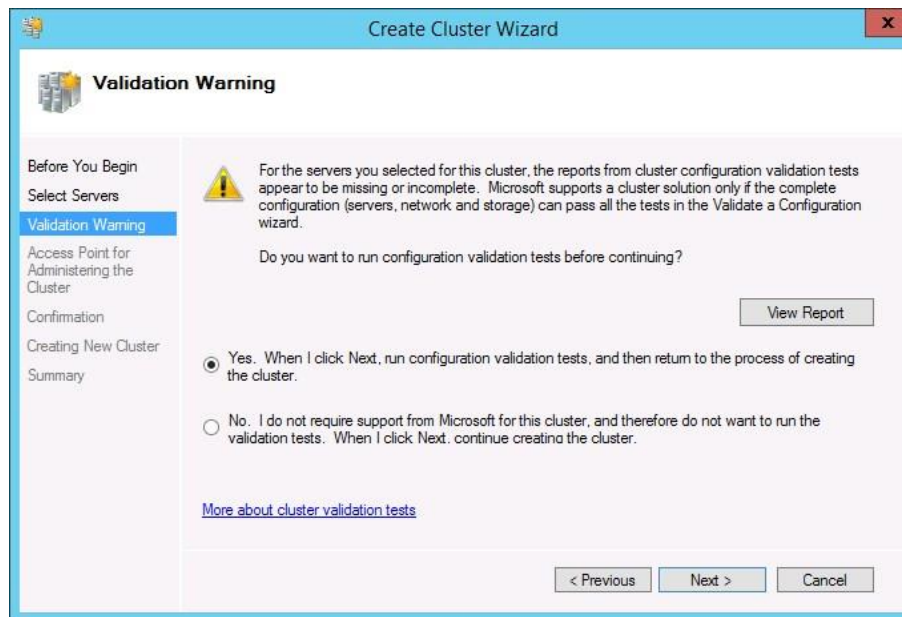

71.   Click the **Create Cluster** link in the Actions section of the Failover Cluster Manger.

72.   Specify the servers to be added to the cluster.

Click **Next** to continue.

73.   Validate the configuration by passing the cluster validation tests: select "Yes…"

Click **Next** to continue.
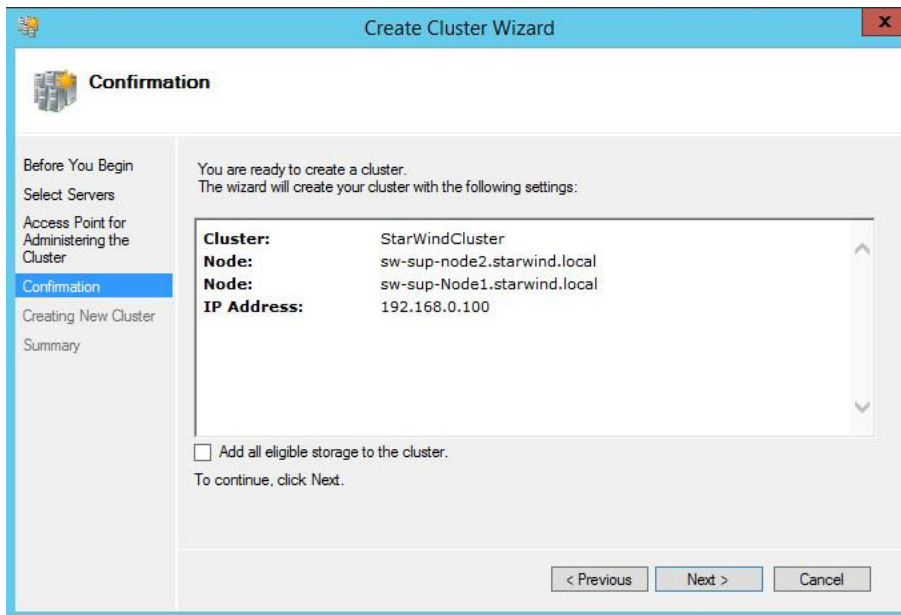
74.   Specify a cluster name.

NOTE: If the cluster servers get IP addresses over DHCP, the cluster also gets its IP address over DHCP. If the IP addresses are set statically, you need to set a cluster IP address manually.
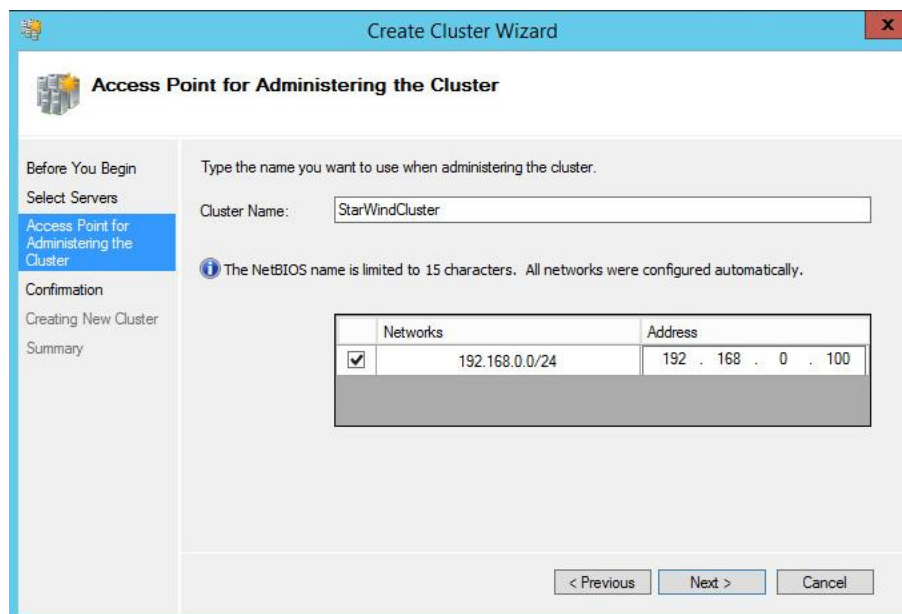

Click **Next** to continue.

75.   Make sure that all of the settings are correct. Click **Previous** to make any changes.

NOTE: If checkbox "**Add all eligible storage to the cluster**" is selected, the wizard will try to add all disks to the cluster automatically. The smallest device will be assigned as Witness. It is recommended to uncheck it before you click **Next** and add **Witness** manually

76.   The process of cluster creation starts. Upon completion, the system displays a report with detailed information.
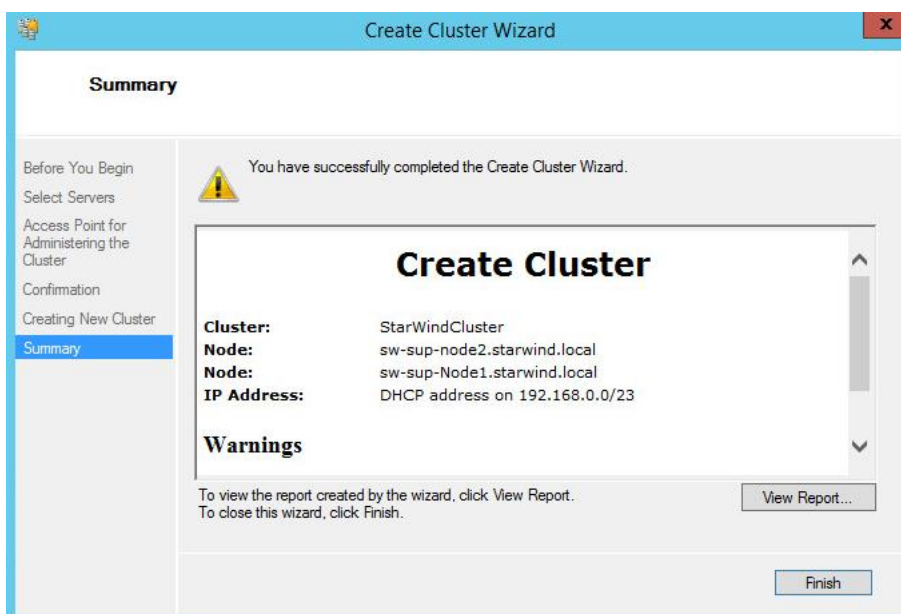

Click **Finish** to close the wizard.

Adding Witness and Cluster Shared Volumes

To add Cluster Shared Volumes (CSV) that is necessary to work with Hyper-V virtual machines:

77. Open **Failover Cluster Manager.**

78. Go to Cluster->Storage -> Disks.

79. Click **Add Disk** in the Actions panel, choose StarWind disks from the list, and click OK.

80. To configure Witness drive, right click the Cluster->More Actions->Configure Cluster Quorum Settings, follow the wizard, and use default quorum configuration
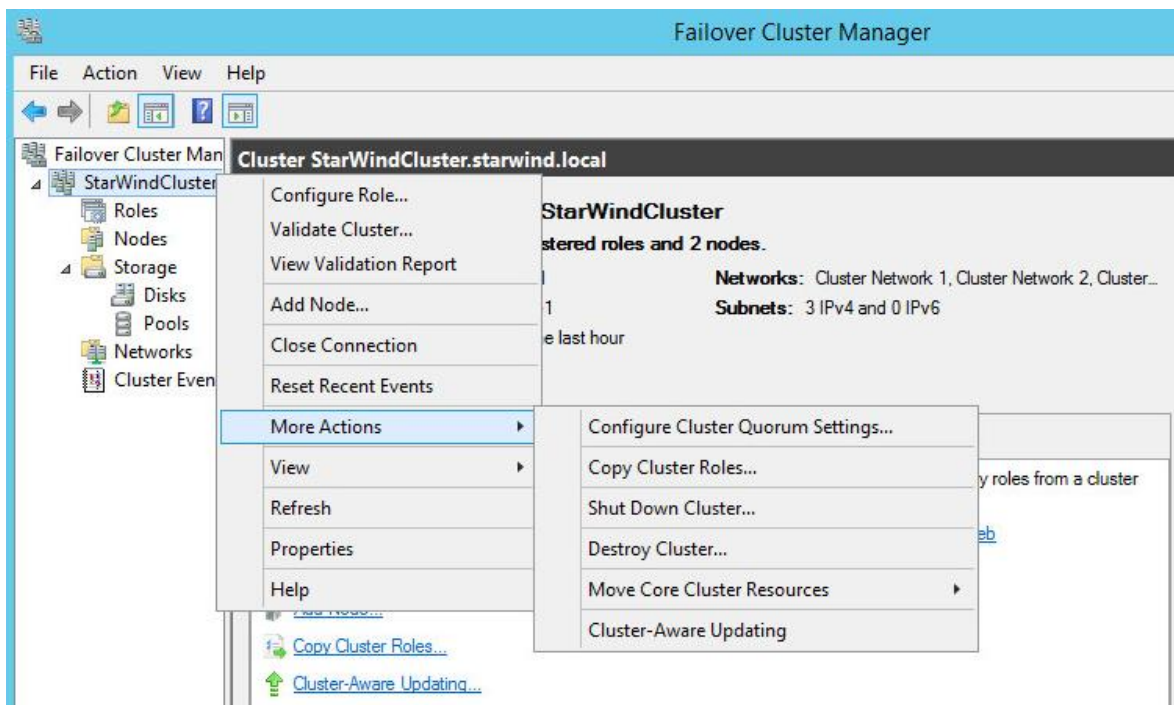
81.   Right-click the required disk and select **Add to Cluster Shared Volumes**.
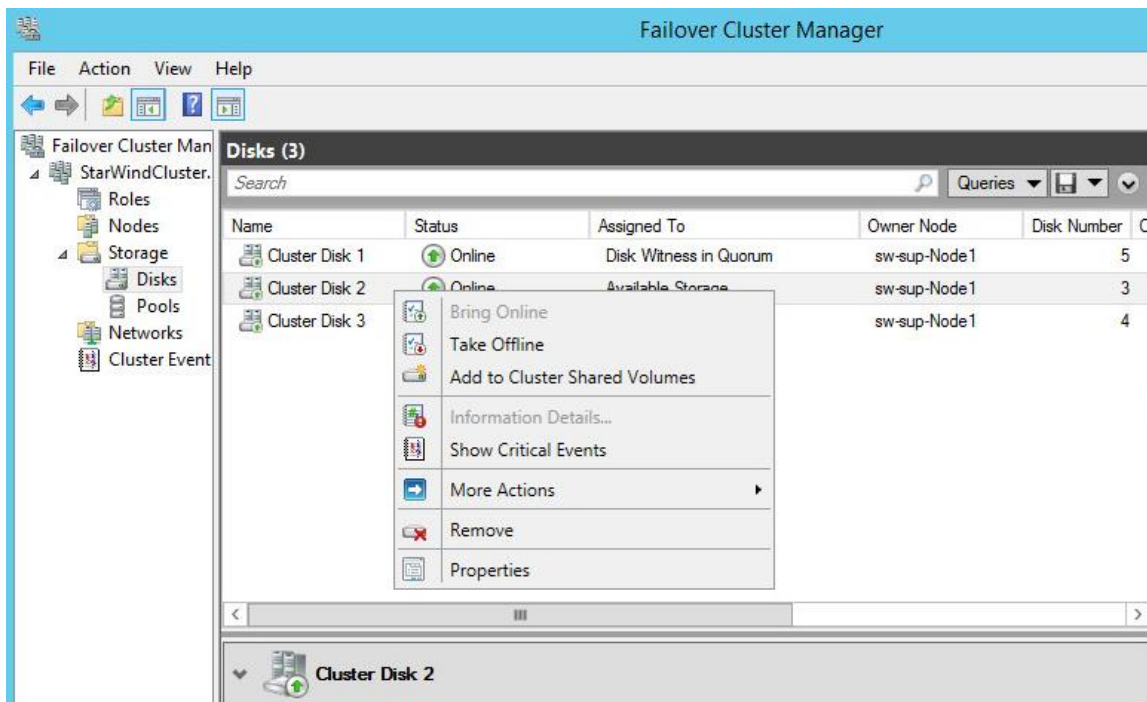
Once the disks are added to the cluster shared volumes list, you can start creating highly available virtual machines on them.

NOTE: to avoid unnecessary CSV overhead configure, each CSV to be owned by one cluster node. This node should also be the preferred owner of the VMs running on that node.

Conclusion

This Cluster will increase the availability of the services or applications on it, as well as exclude the downtime during the maintenance.

In case you need help or have any additional questions, visit our Support Forum, and our technical support department will gladly provide answers to Your questions.

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