

StarWind Native SAN:

Providing HA Shared Storage for Hyper-V
March 2012

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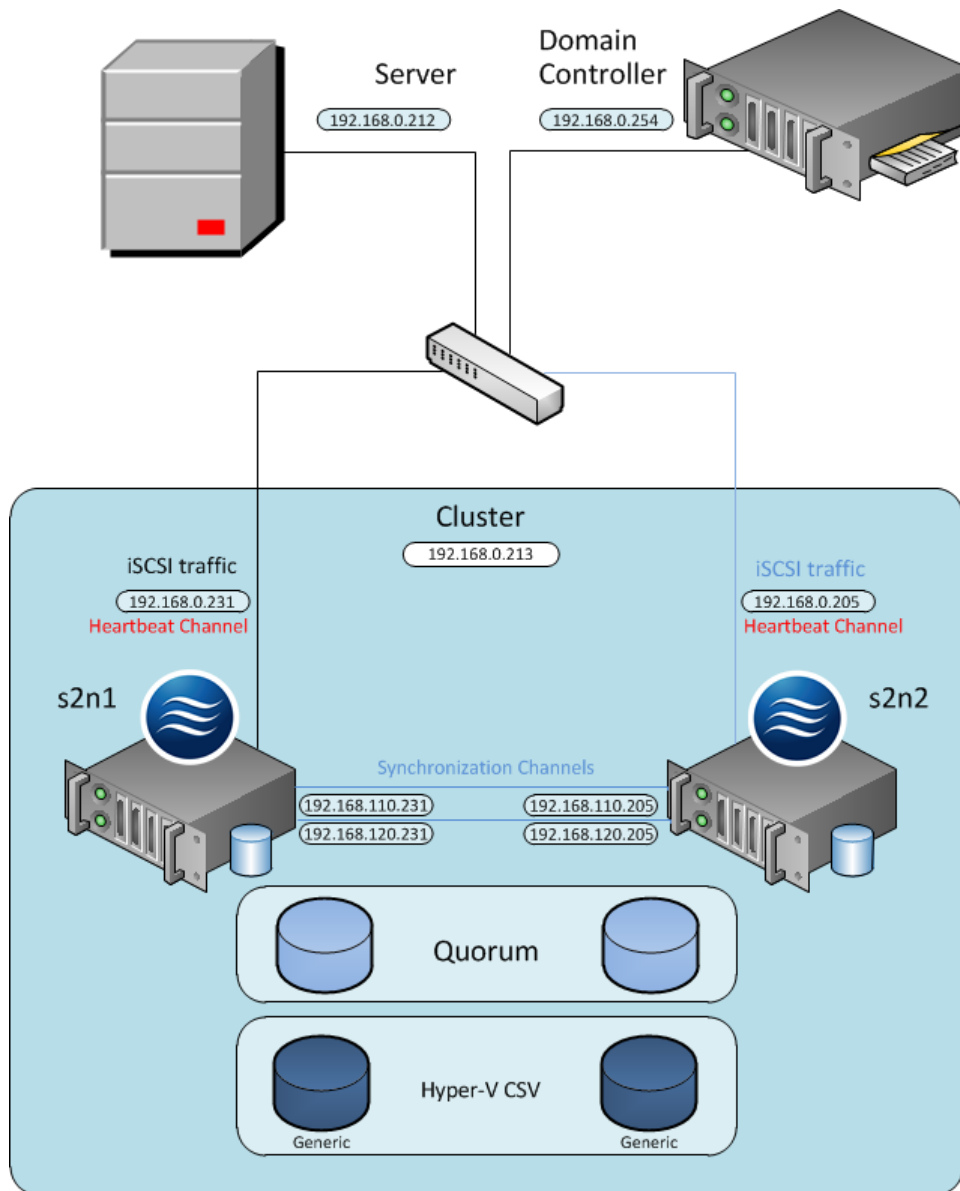
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INTRODUCTION

Software clustering technology allows a group of systems function as unified redundant network resource. There are different cluster configurations that can be implemented, though a failover cluster is one of the most frequently used. Its High Availability (HA) configuration assumes that if one of the cluster nodes fails, the reserved node automatically comes online, providing little or no application downtime. With this type of configuration, user workflow remains virtually uninterrupted and secured.

Failover cluster configuration requires two or more server nodes that share an external storage. Based on the iSCSI technology, the StarWind solution enables creation of an external storage system in the Windows environment without expensive Fiber Channel or external SCSI solutions. With StarWind you can create a shared disk array on a host running Microsoft Windows Server.

This document provides step-by-step instructions on configuring StarWind Native SAN with Hyper-V and failover clustering.



CONFIGURING SHARED STORAGE

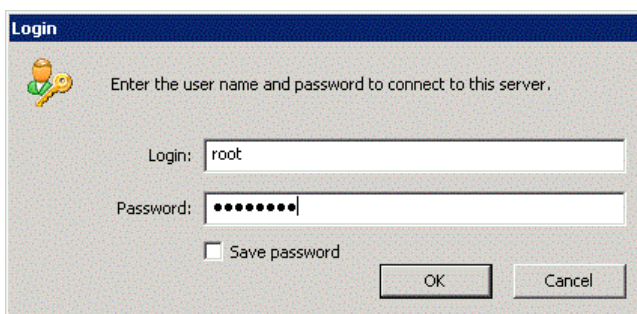
1. Launch **StarWind Management Console** by clicking **Start -> All Programs -> StarWind Software -> StarWind -> StarWind Management Console**.

Note: The **StarWind Console icon** appears in the system tray, when the **Console** is running. To open **StarWind Management Console**, double-click the icon, or right click it. Then select **Start Management Console** from the Shortcut menu.

2. From the **Console tree**, select the server you want to provide with the iSCSI target device.

3. Double-click the host to connect.

4. You will be prompted to enter login and password. The default login and password are “**root**” and “**starwind**”. You can always change them later.



Note: Optionally select the **Save password** checkbox to save a password.

5. Click **OK** to continue.

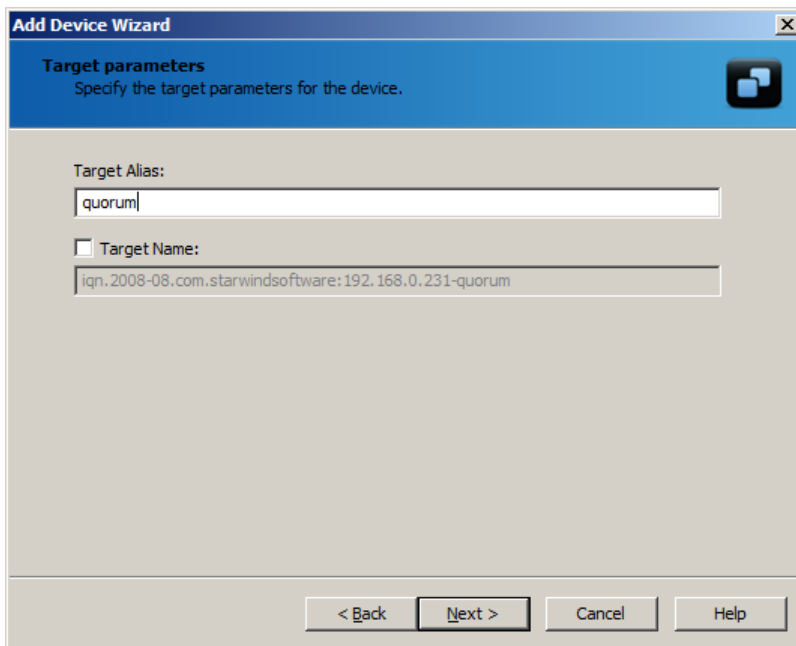
6. Click **Add Target** on the toolbar.

7. **Add Device Wizard** appears. Please, follow the wizard's steps to complete creation of a new HA device.

8. Go to **Hard Disk->Advanced Virtual->High Availability Device** to select the HA device type.

9. Click **Next** to continue.

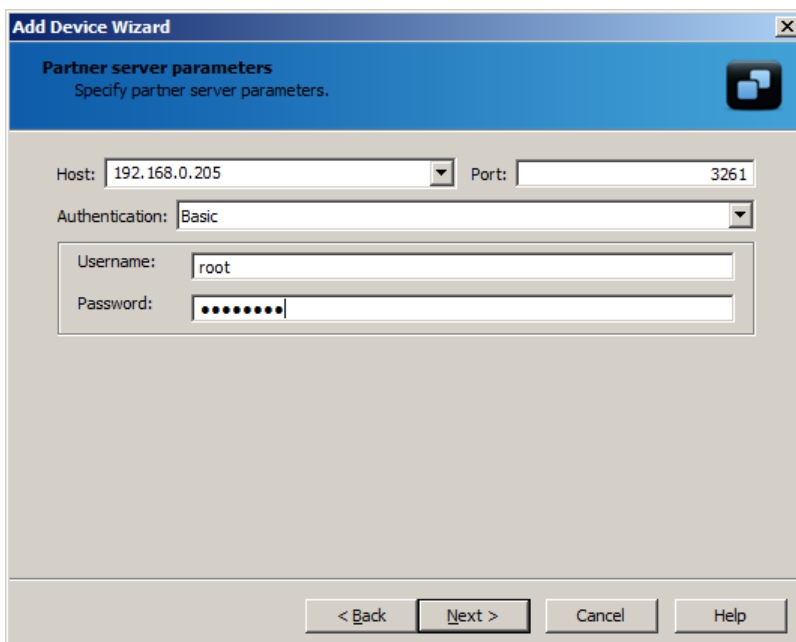
10. In the **Target Alias** and **Target Name** text fields, specify corresponding information. The name must be unique. Under this name the device is declared to the iSCSI initiators, connecting to the StarWind Service over an IP network.



The screenshot shows the 'Add Device Wizard' dialog box with the 'Target parameters' step selected. The title bar reads 'Add Device Wizard'. The main heading is 'Target parameters' with the instruction 'Specify the target parameters for the device.' Below this, there are two text input fields. The first is labeled 'Target Alias:' and contains the text 'quorum'. The second is labeled 'Target Name:' and contains the text 'iqn.2008-08.com.starwindsoftware:192.168.0.231-quorum'. At the bottom of the dialog, there are four buttons: '< Back', 'Next >', 'Cancel', and 'Help'.

11. Click **Next** to continue.

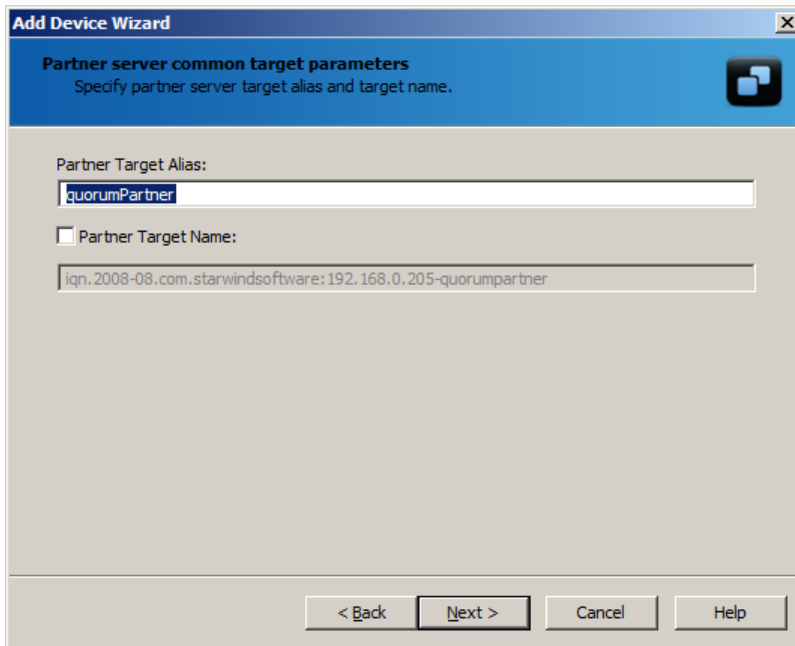
12. Specify the partner server parameters. Enter the server's IP-address in the **Host** text field, and specify username and password for the StarWind Service in the corresponding text fields.



The screenshot shows the 'Add Device Wizard' dialog box with the 'Partner server parameters' step selected. The title bar reads 'Add Device Wizard'. The main heading is 'Partner server parameters' with the instruction 'Specify partner server parameters.' Below this, there are several input fields. The 'Host' field contains '192.168.0.205' and the 'Port' field contains '3261'. The 'Authentication' dropdown menu is set to 'Basic'. Below these are two more text input fields: 'Username:' containing 'root' and 'Password:' containing a series of dots. At the bottom of the dialog, there are four buttons: '< Back', 'Next >', 'Cancel', and 'Help'.

13. Click **Next** to continue.

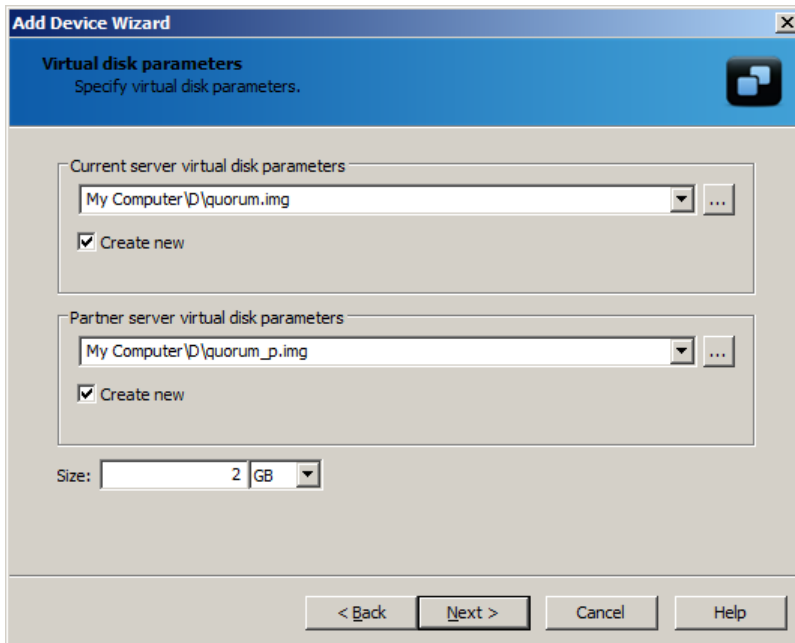
14. In the **Partner Target Alias** and **Partner Target Name** text fields specify corresponding information.



15. Click **Next** to continue.

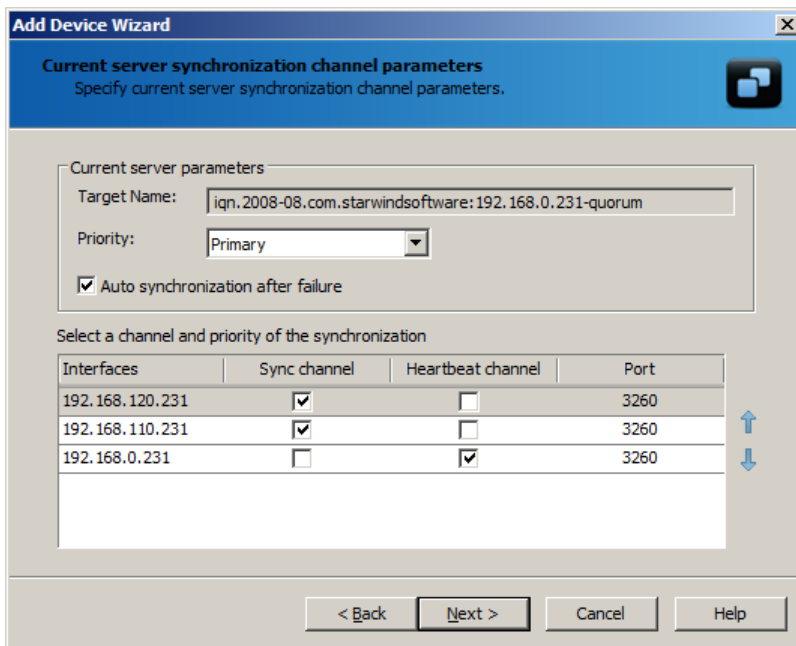
16. In the **Virtual disk parameters of the current server** field and the **Virtual disk parameters of the partner server** field specify name and location of HA virtual disks on the current and partner hosts, respectively. Click **...** for that purpose.

If you want to create new virtual disks, select the **Create New** checkbox.



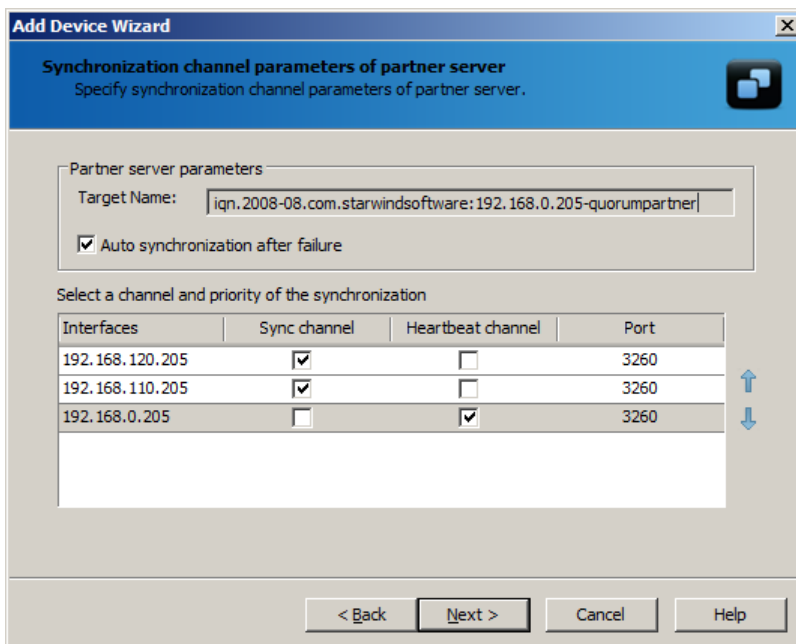
17. Click **Next** to continue.

18. Configure the data synchronization and heartbeat channels parameters of the current server. You can also specify Primary or Secondary node priority.



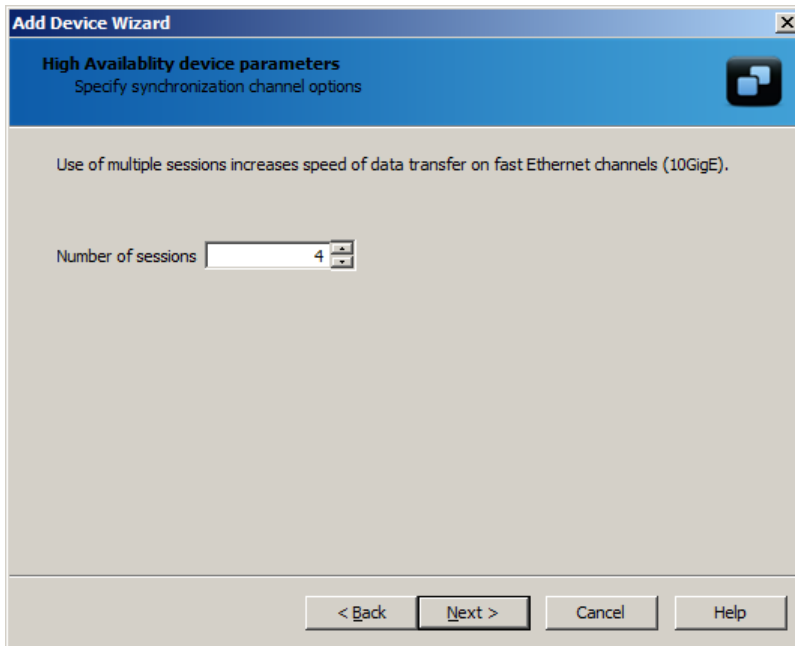
19. Click **Next** to continue.

20. Specify synchronization channel parameters of the partner server.



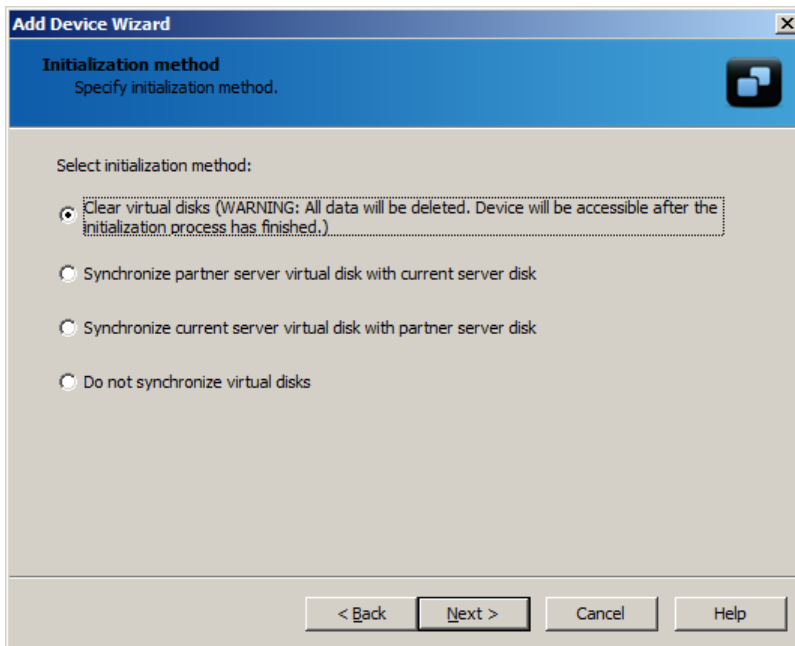
21. Click **Next** to continue.

22. Specify number of iSCSI sessions in the synchronization channel.



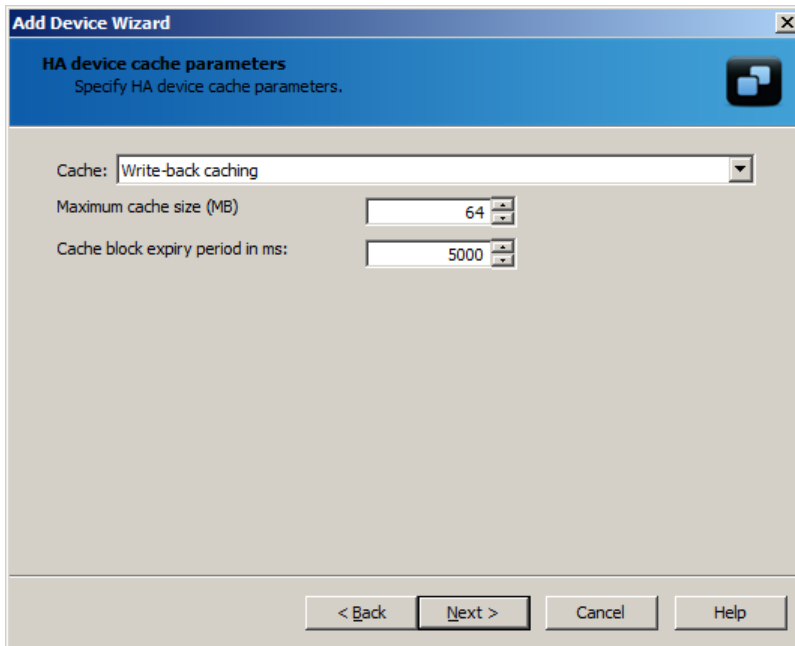
23. Click **Next** to continue.

24. Select initialization method of the HA device.



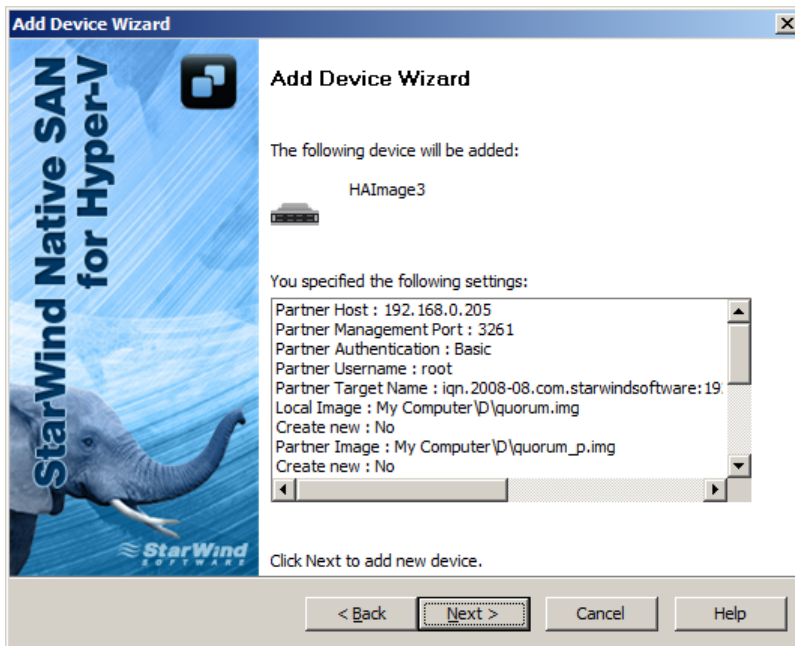
25. Click **Next** to continue.

26. Specify cache parameters of the HA device.



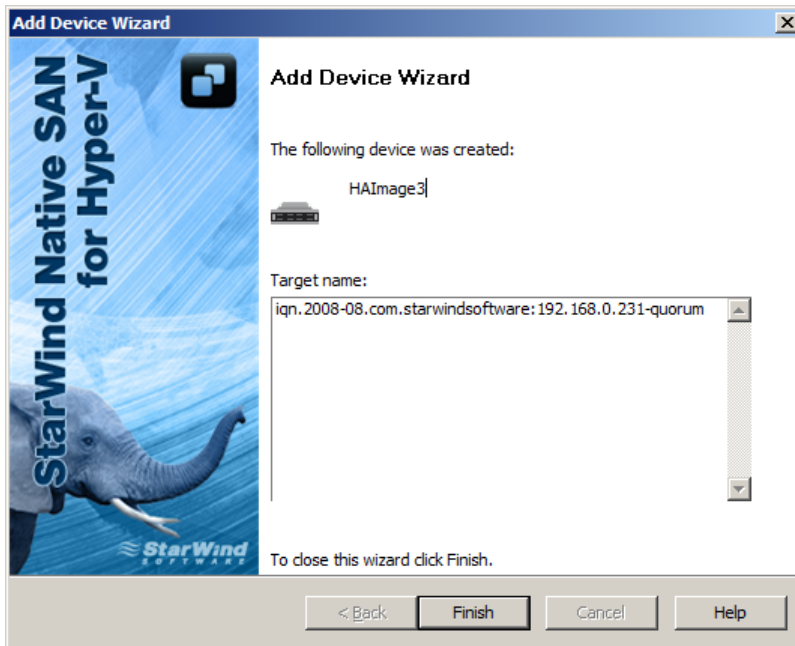
27. Click **Next** to continue.

28. Check whether device parameters are correct. Click **Back** to make any changes.



29. Click **Next** to continue.

30. Click **Finish** to close the wizard.



Follow the same procedure to create the second device, that'll be used as cluster storage.

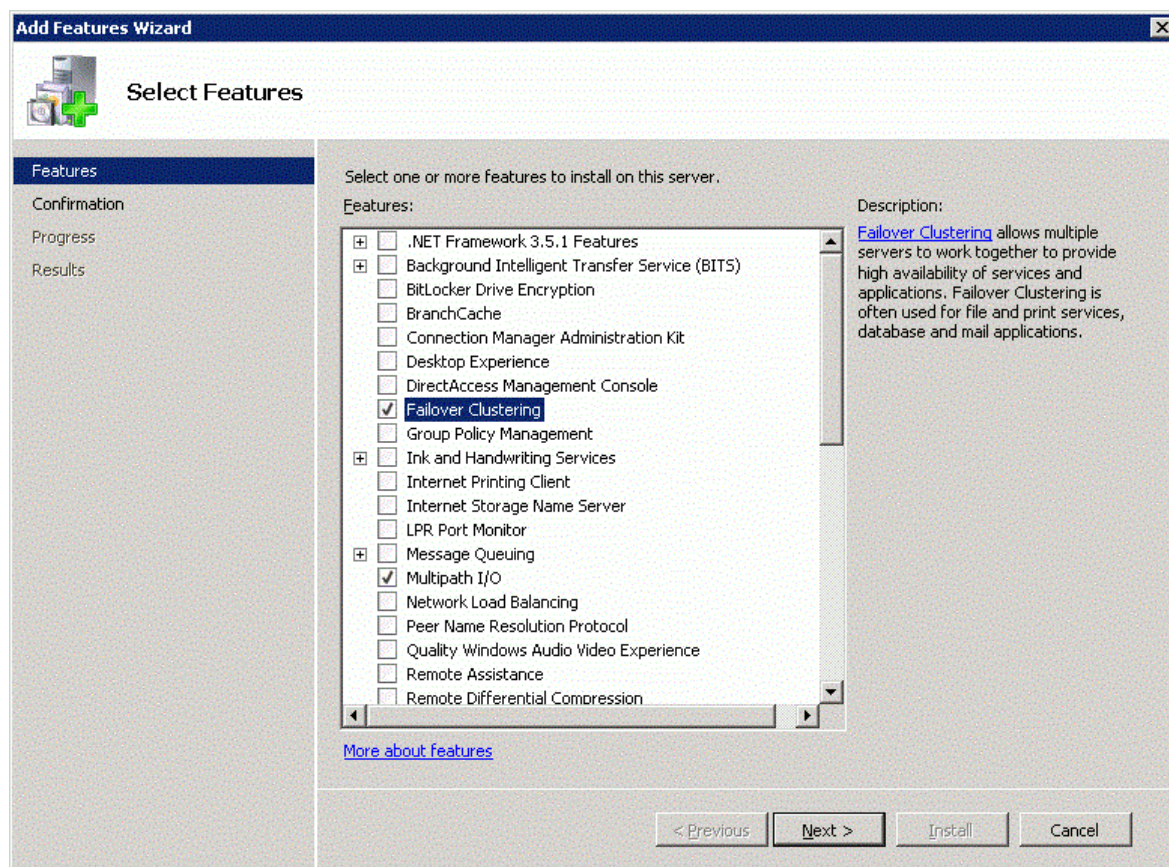
CONFIGURING HYPER-V SERVERS

This document assumes that you already have configured Active Directory and two servers in the domain. Besides, you are expected to have the **Failover Clustering, Multipath I/O** features enabled, as well as the **Hyper-V** role installed on both servers.

You can configure these features in the **Features and Roles** sections of **Server Manager**.

1. Launch **Server Manager**, select the **Features** item and click the **Add Features** link.
2. **Add Features Wizard** appears. Select **Multipath I/O** and **Failover Clustering** features checkboxes and follow the wizard's instructions.

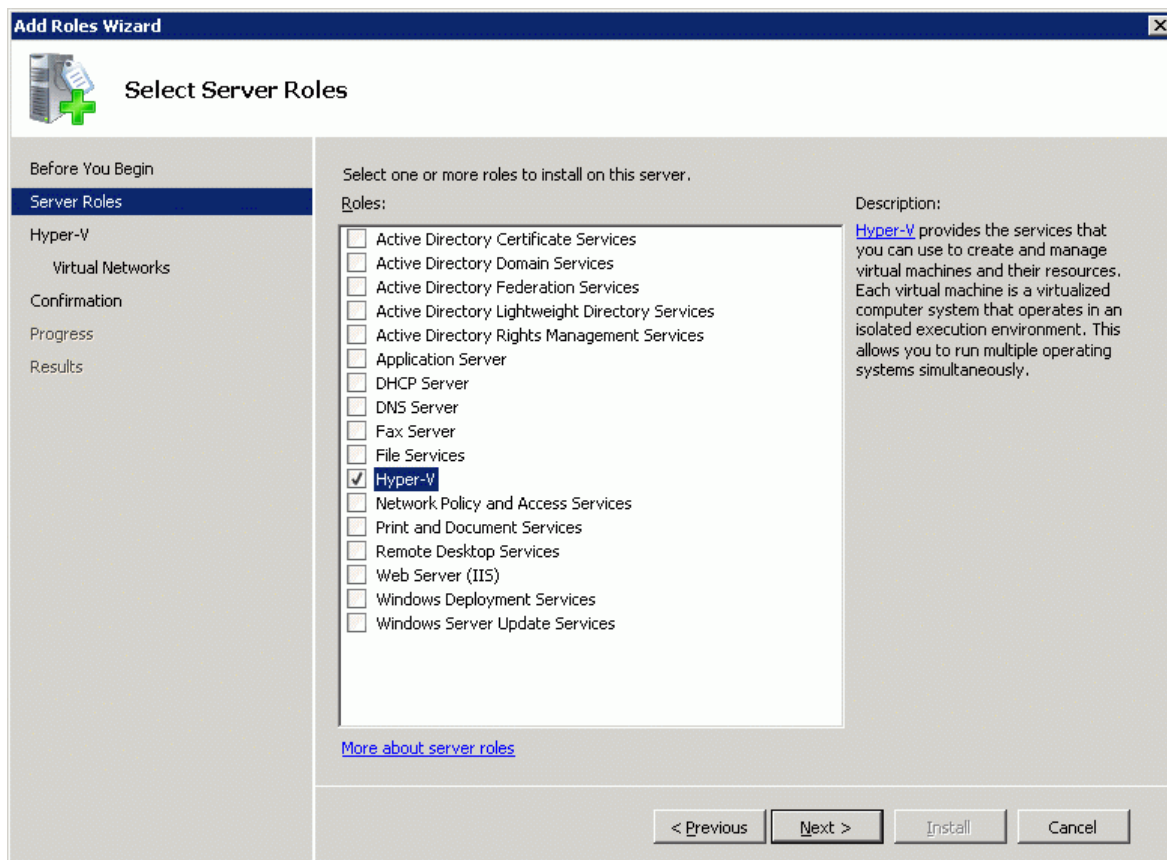
Note: Restart the server after installation is completed. **Do not restart both nodes at the same time!** First, restart one node, and wait until the device synchronization process is finished. Then, restart the second node.



3. Launch **Server Manager**, select the **Server Roles** item, and click the **Add Roles** link.

4. **Add Roles Wizard** appears. In the **Roles** section, select the **Hyper-V** checkbox and follow the wizard's instructions.

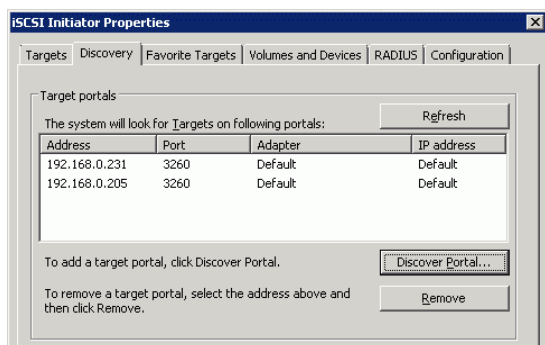
Note: Restart the server after installation is completed. **Do not restart both nodes at the same time!** First, restart one node, and wait until the device synchronization process is finished. Then, restart the second node.



Connecting Targets

This step implies connection of previously created disks of all the servers which make up the cluster.

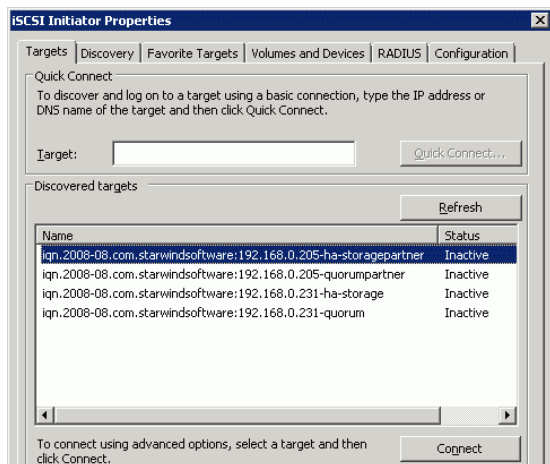
1. Launch **Microsoft iSCSI Initiator** and click the **Discovery** tab.
2. Enter IP address of both StarWind servers in the **Discover Target Portal** window.



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

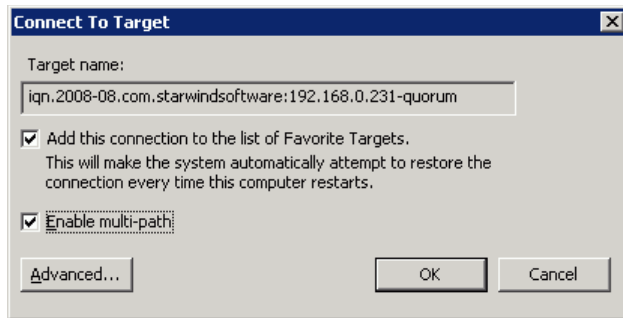
Note: If the created targets are not listed, check the firewall settings on the StarWind server as well as the list of networks served by the StarWind server. To check it, go to **StarWind Management Console -> Configuration -> Network**.

4. Select each target and click **Connect**.



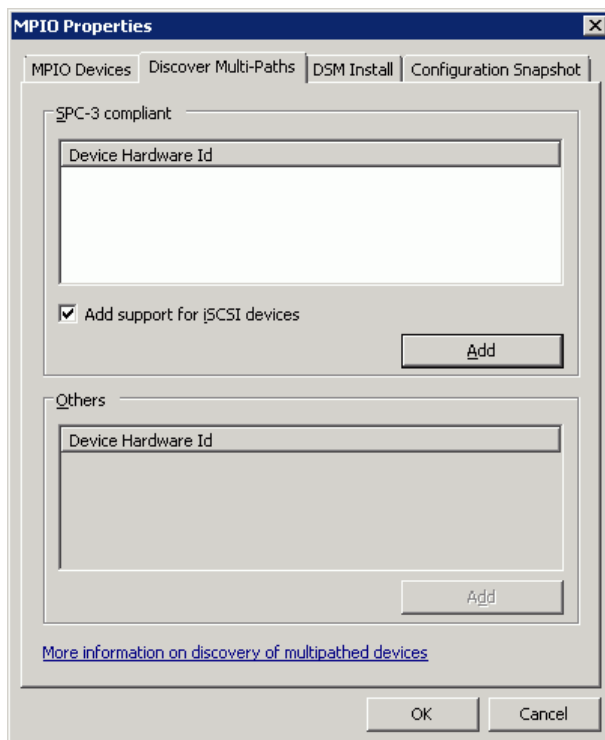
5. In the **Connect to Target** dialog box select **Add this connection to the list of Favorite Targets** and **Enable multi-path** check boxes. This is necessary to automatically reconnect to the targets after client restart.

6. Click **Ok**.



7. The **iSCSI Initiator Properties** window appears.

6. Now open **MPIO manager** by clicking **Start -> Administrative Tools -> MPIO**.



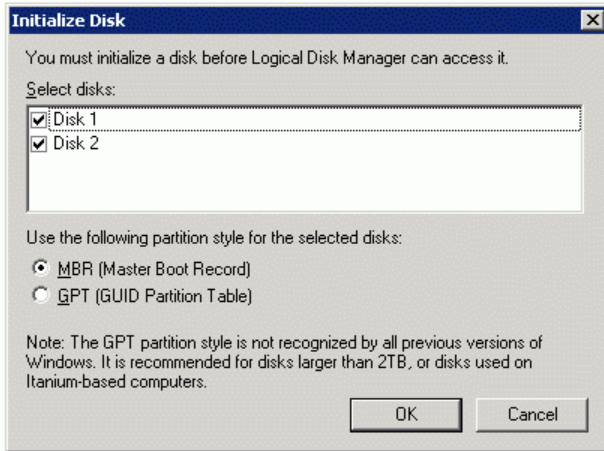
7. Go to the **Discover Multi-Paths** tab. Select the **Add support for iSCSI devices** check box and click **Add**. When prompted to restart the server, click **Yes** to proceed.

Note: Do not restart both nodes at the same time! First, restart one node, and wait until the device synchronization process is finished. Then, restart the second node.

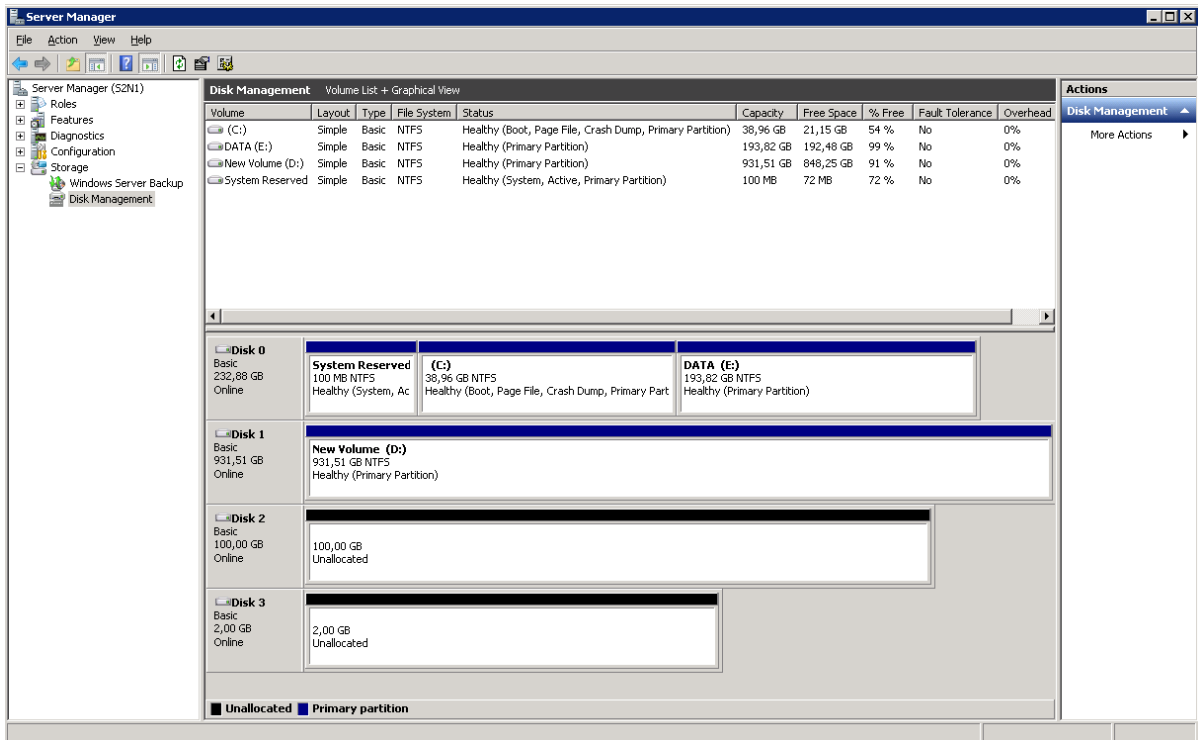
8. After the server is restarted, initialize the disk and create partitions, as if it were physical hard drive.

Note: The procedures performed on the first server are automatically shown on the second one.

9. Launch **Server Manager** and go to the **Disk Management** section. Bring the available disks online and initialize them.

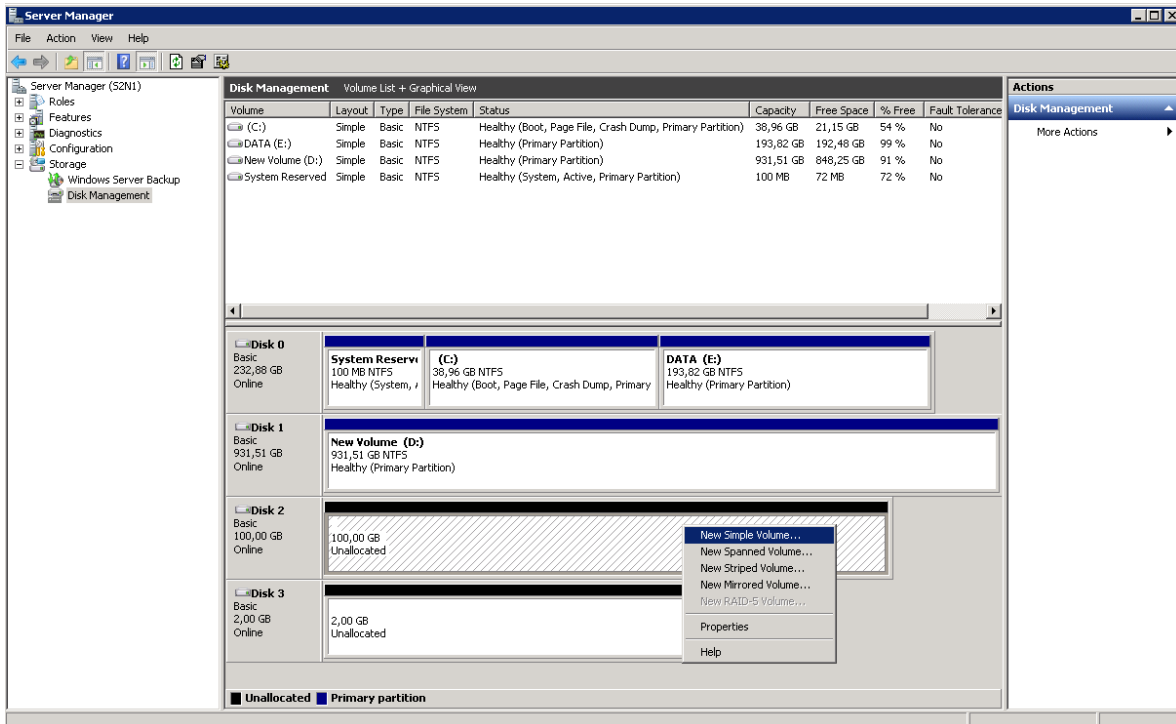


10. The **Server Manager** window appears. Two new empty disks are detected by the system.

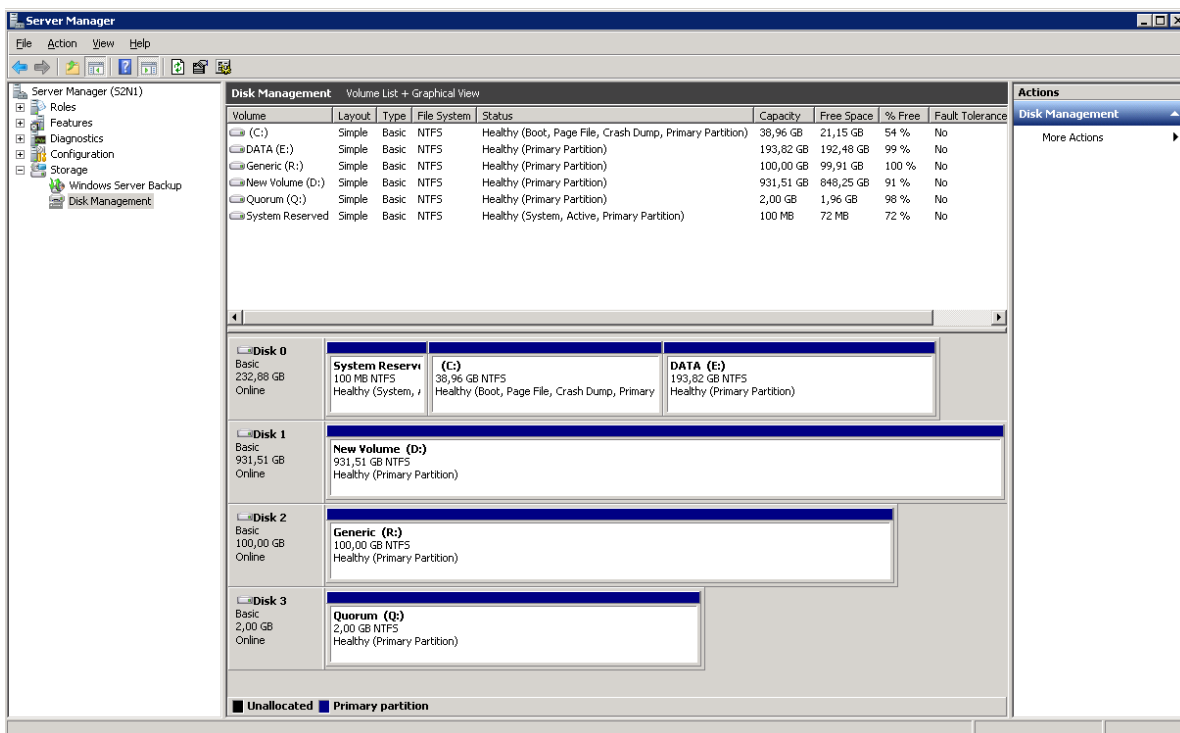


To create partitions and format new disks:

1. Right-click each of the disks, and select the **New Simple Volume** item from the **Shortcut menu**.

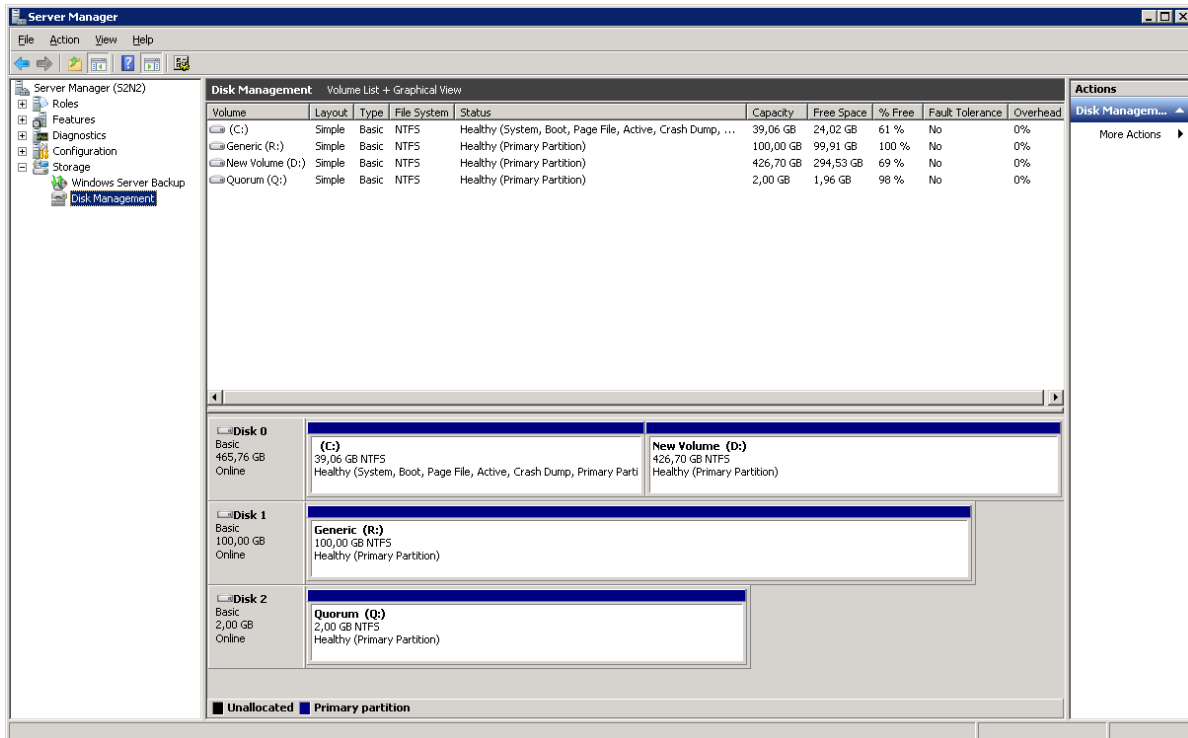


2. Follow the wizard's instructions to create partitions. In the end the **Server Manager** window appears.



Follow the same procedure for the other servers, except that creating partitions is no longer necessary:

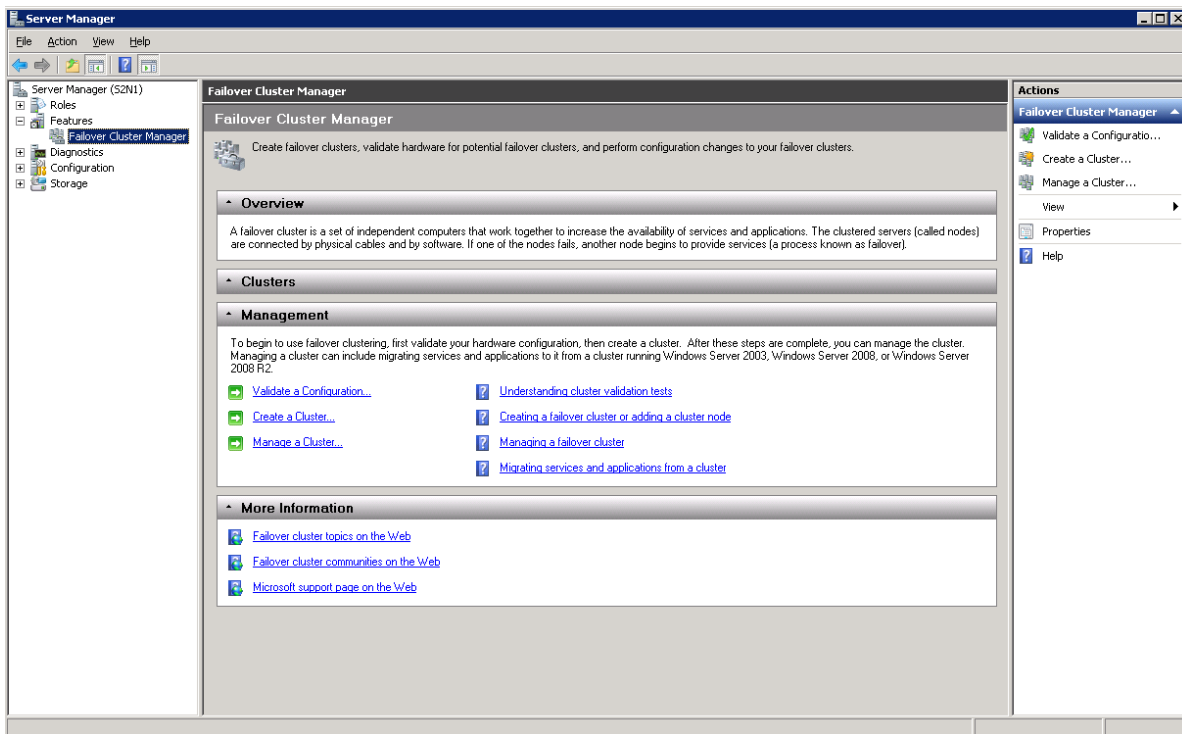
1. Launch **Microsoft iSCSI Initiator**, and click the **Discovery** tab.
2. Add IP address of the StarWind server to **Target Portals**.
3. Click the **Targets** tab and connect System to the targets by selecting the **Add this connection to the list of Favorite Targets** and **Enable multi-path** checkboxes.
4. Launch **Server Manager**, go to the **Disk Management** section, and bring the available disks online. The **Server Manager** window appears.



Creating a Cluster

To validate a cluster:

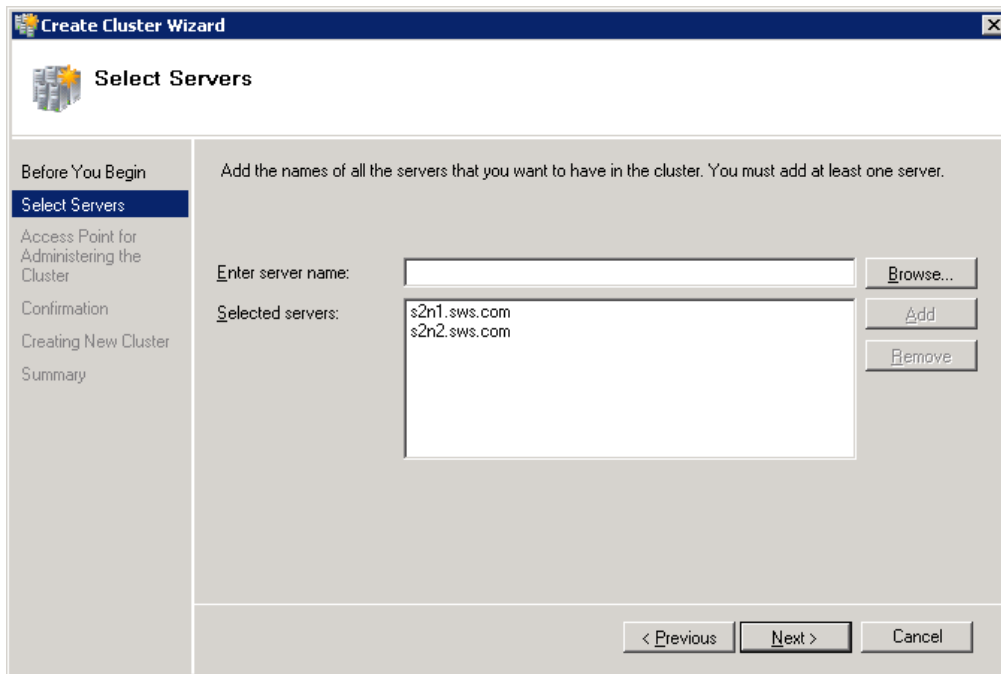
1. Open **Server Manager**. Expand the **Features** item on the **Console tree** and select the **Failover Cluster Manager** item.



2. Before creating a cluster, you need to validate your configuration. In the **Actions** pane, click **Validate a Configuration** to verify whether your servers are suitable for building a cluster. As validation is completed, you are returned to the **Failover Cluster Manager** window.

To create a cluster:

1. Click the **Create a Cluster** item in the **Actions** pane.
2. **Create Cluster Wizard** appears. Click **Browse** to specify the servers that will be included into the cluster, or enter their names manually.

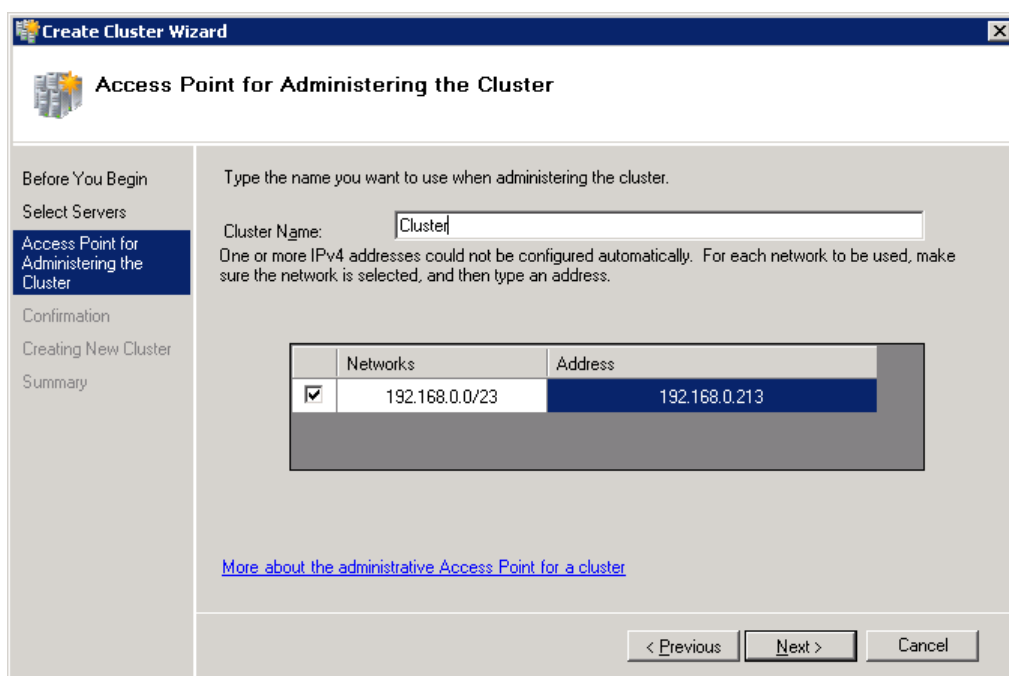


The screenshot shows the 'Create Cluster Wizard' dialog box with the 'Select Servers' step selected in the left-hand navigation pane. The main area contains the following text: 'Add the names of all the servers that you want to have in the cluster. You must add at least one server.' Below this text is a text input field labeled 'Enter server name:' with a 'Browse...' button to its right. Below the input field is a list box labeled 'Selected servers:' containing the entries 's2n1.sws.com' and 's2n2.sws.com'. To the right of the list box are 'Add' and 'Remove' buttons. At the bottom of the dialog are '< Previous', 'Next >', and 'Cancel' buttons.

3. Click **Next** to continue.

4. Specify the cluster name.

Note: If IP addresses of the cluster servers are assigned by DHCP, the cluster's IP address is also assigned by DHCP. If the IP addresses are set statically, you need to set an IP address for the cluster manually.

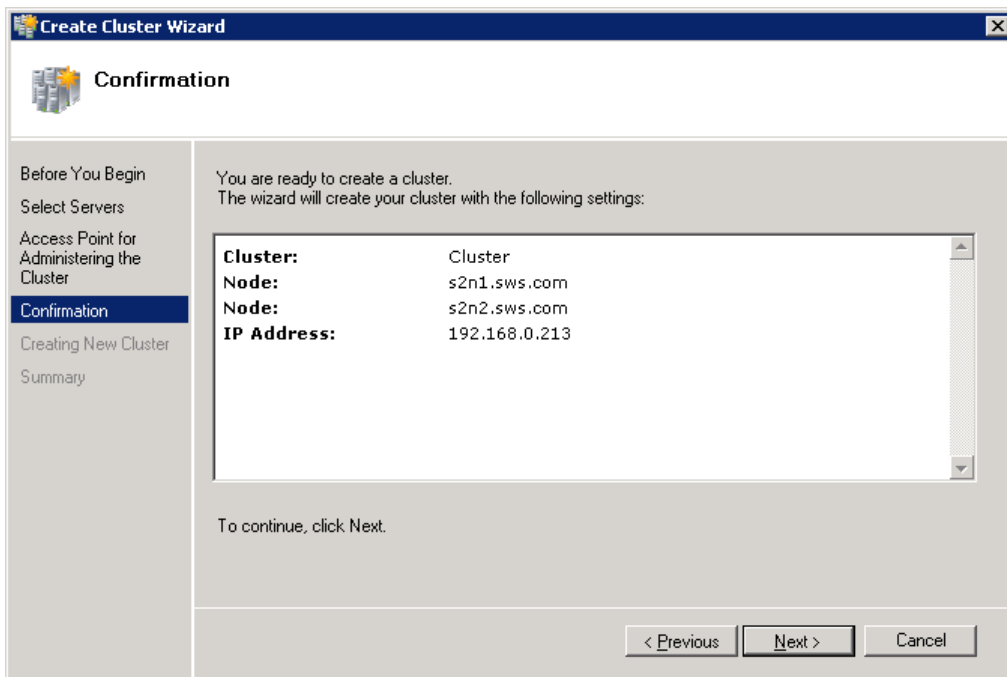


The screenshot shows the 'Create Cluster Wizard' dialog box with the 'Access Point for Administering the Cluster' step selected in the left-hand navigation pane. The main area contains the following text: 'Type the name you want to use when administering the cluster.' Below this text is a text input field labeled 'Cluster Name:' with the value 'Cluster1' entered. Below the input field is the text: 'One or more IPv4 addresses could not be configured automatically. For each network to be used, make sure the network is selected, and then type an address.' Below this text is a table with two columns: 'Networks' and 'Address'. The table has one row with a checked checkbox in the 'Networks' column, the value '192.168.0.0/23' in the 'Networks' column, and the value '192.168.0.213' in the 'Address' column. Below the table is a blue hyperlink: '[More about the administrative Access Point for a cluster](#)'. At the bottom of the dialog are '< Previous', 'Next >', and 'Cancel' buttons.

Networks	Address
<input checked="" type="checkbox"/> 192.168.0.0/23	192.168.0.213

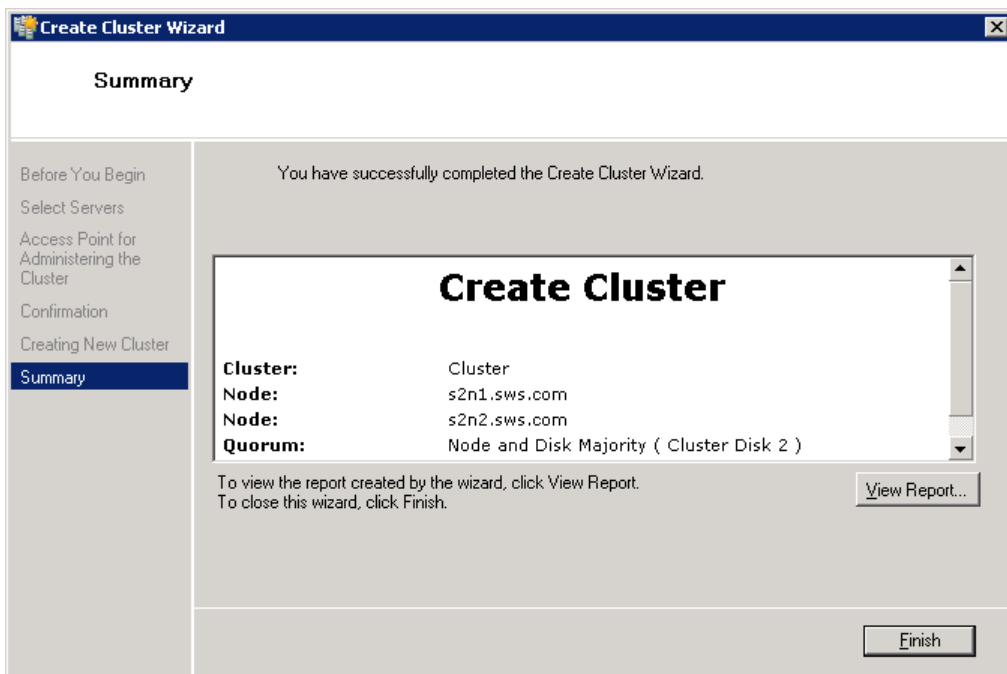
5. Click **Next** to continue.

6. Make sure that all of the previously defined options are correct. Click **Previous** to make any changes.

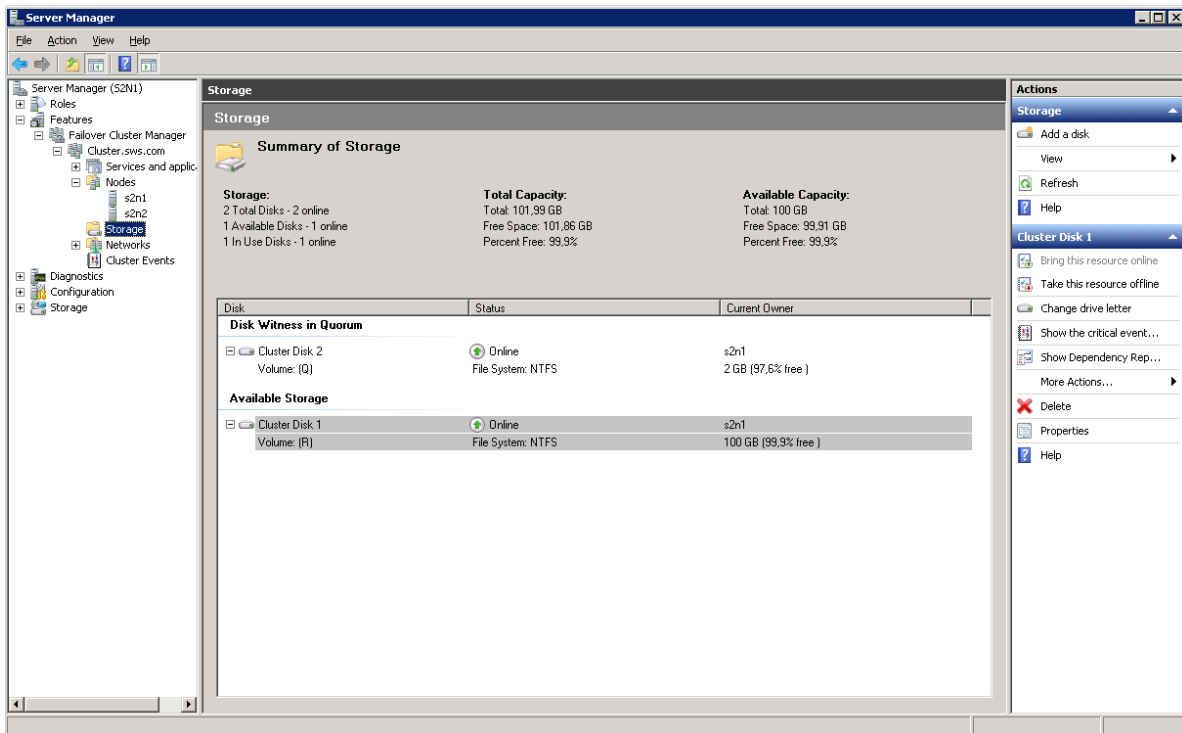


7. Click **Next** to continue.

8. The process of creating a cluster begins. After a cluster is created, a report with additional information appears. Click **Finish** to close the wizard.



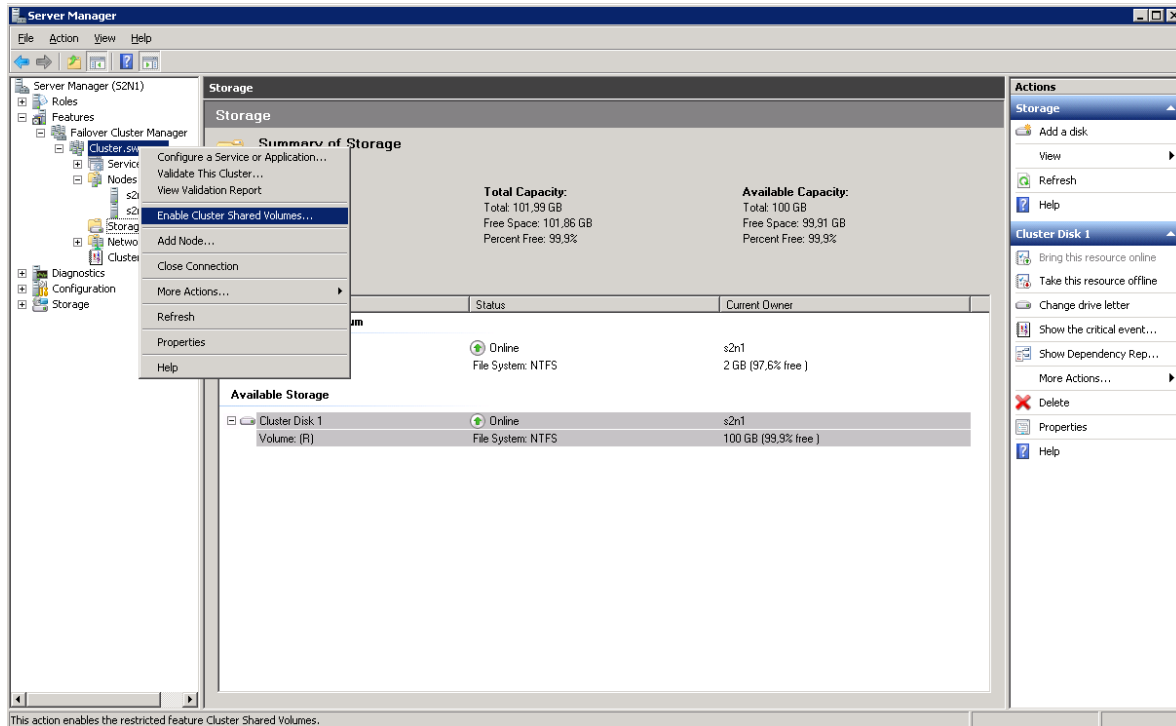
9. Failover Cluster Manager appears.



Enabling Cluster Shared Volumes

To enable **Cluster Shared Volumes (CSV)**, perform the following actions:

1. Right-click the cluster, and click **Enable Cluster Shared Volumes**.

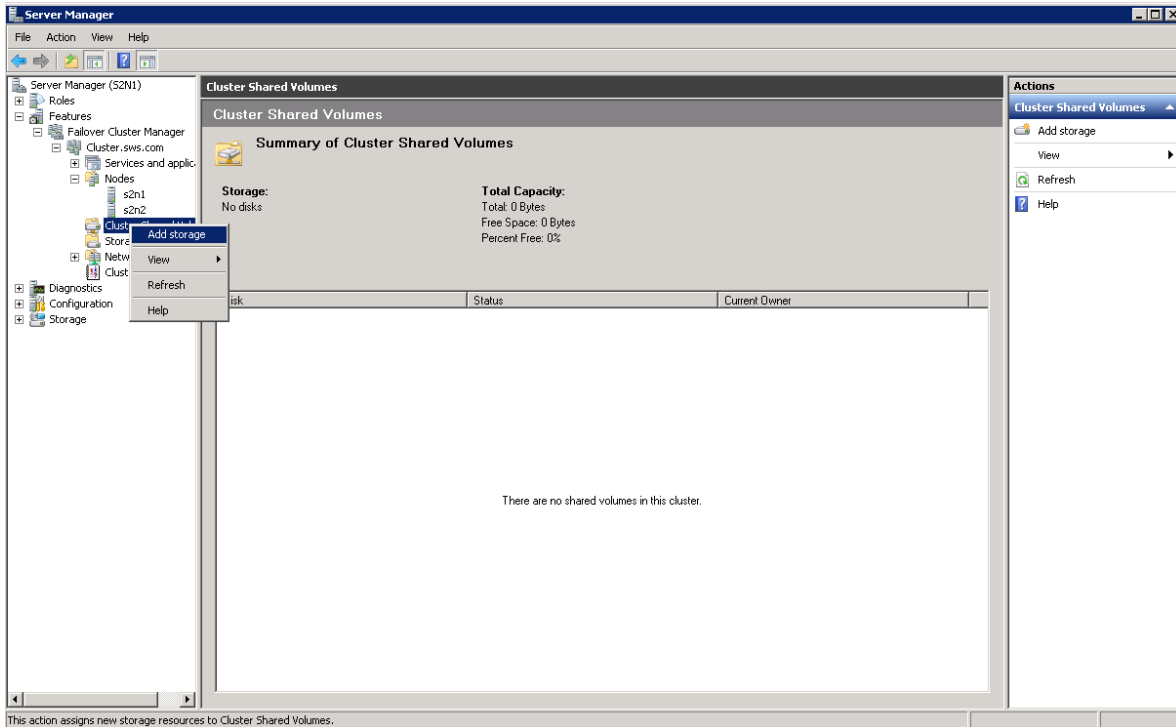


2. As CSV warning message appears, read it carefully.

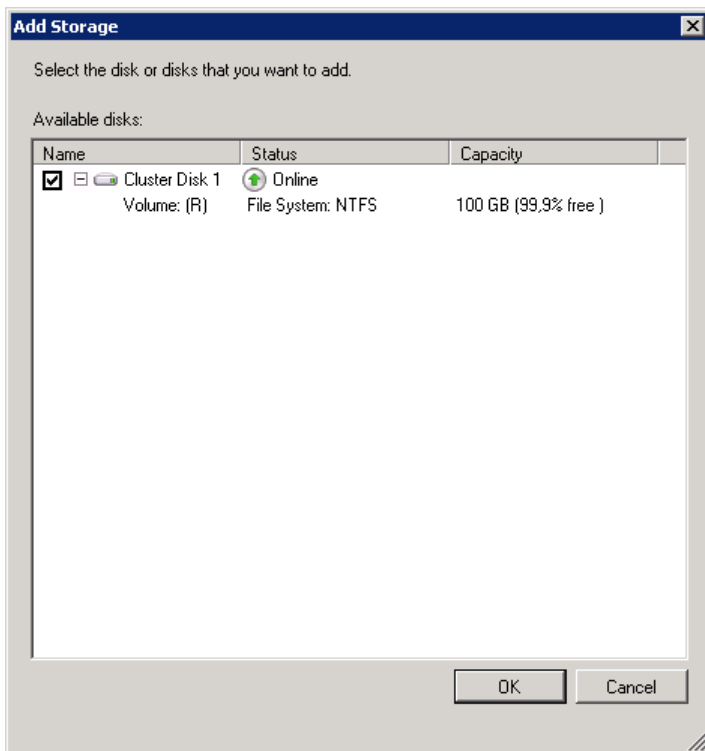
Note: Use the CSV feature for its intended purpose only.

3. Click **OK**.

4. The **Cluster Shared Volumes** item appears in the **Actions** pane. Right-click this item, and select **Add storage**.

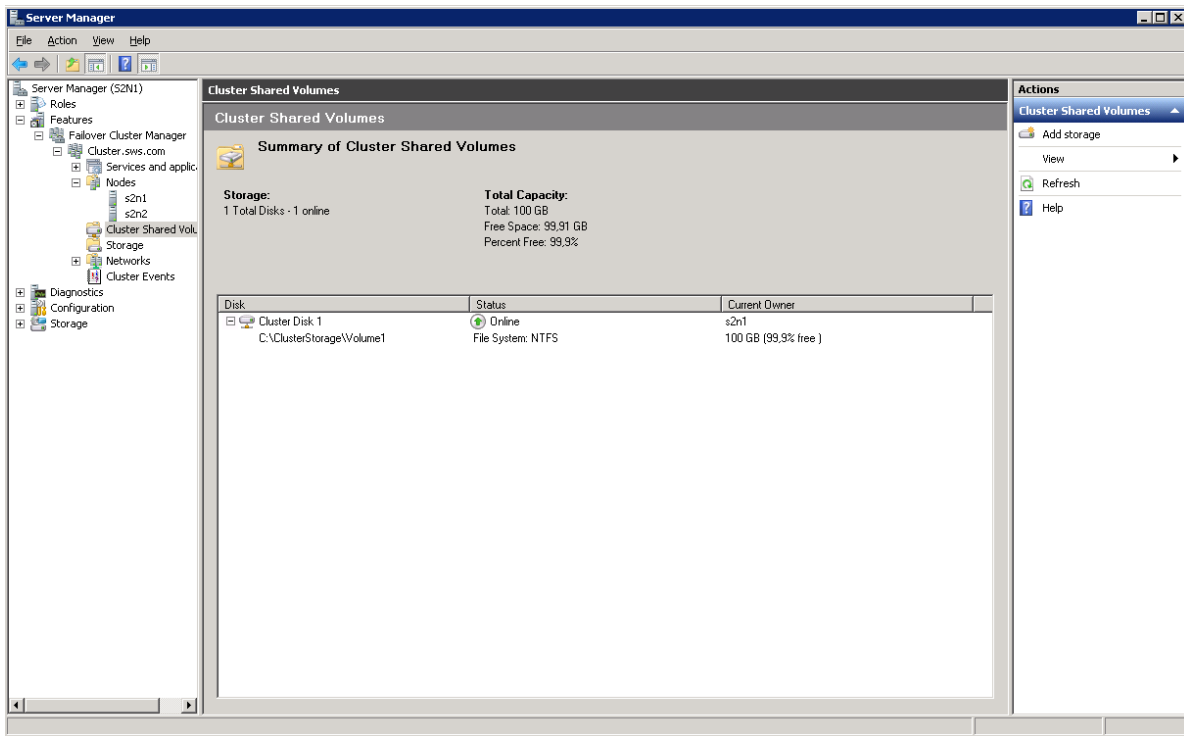


5. In the **Add Storage** dialog box that appears, specify the disk to be added.



6. Click **OK**.

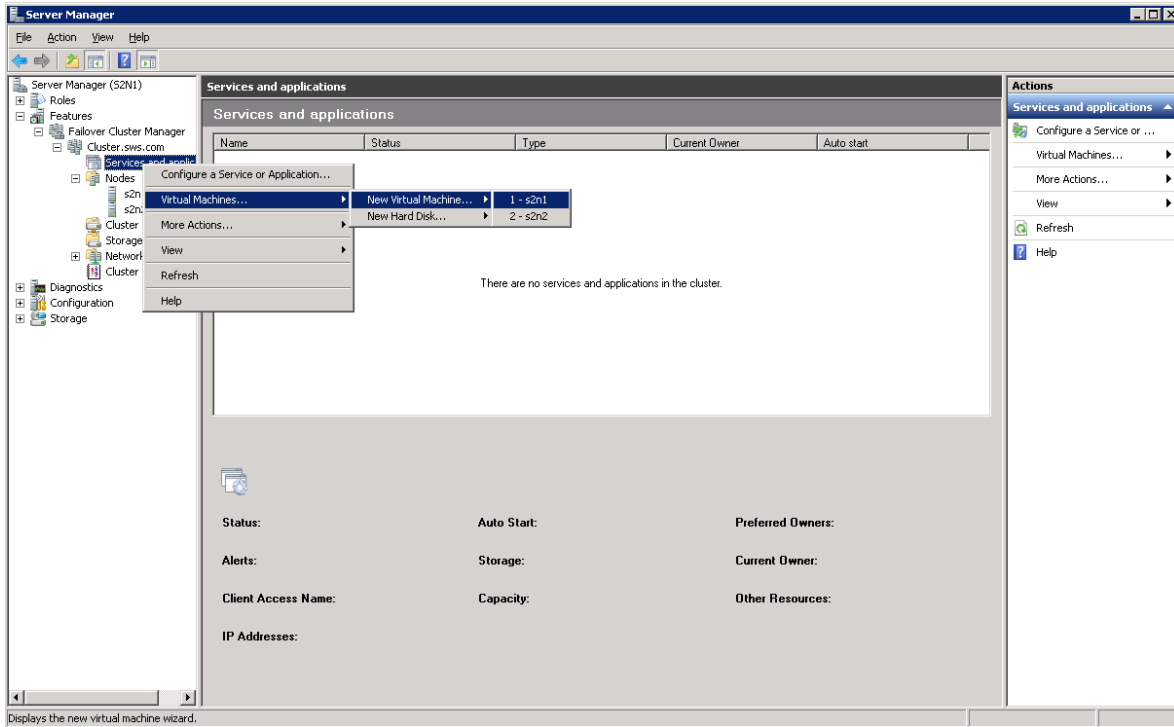
7. The **Server Manager** window appears.



Creating a Highly Available Virtual Machine

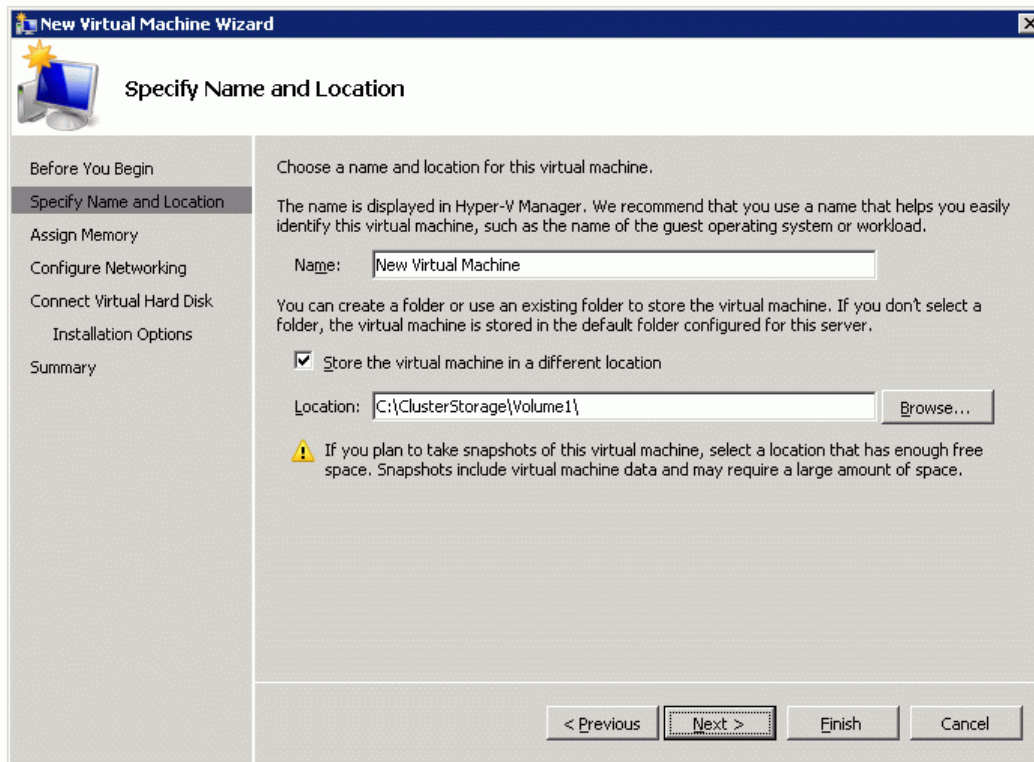
To create an HA virtual machine:

1. Launch **Server Manager**.
2. Right-click the **Services and applications** and click **Virtual Machines -> New Virtual Machine -> [host name]**.



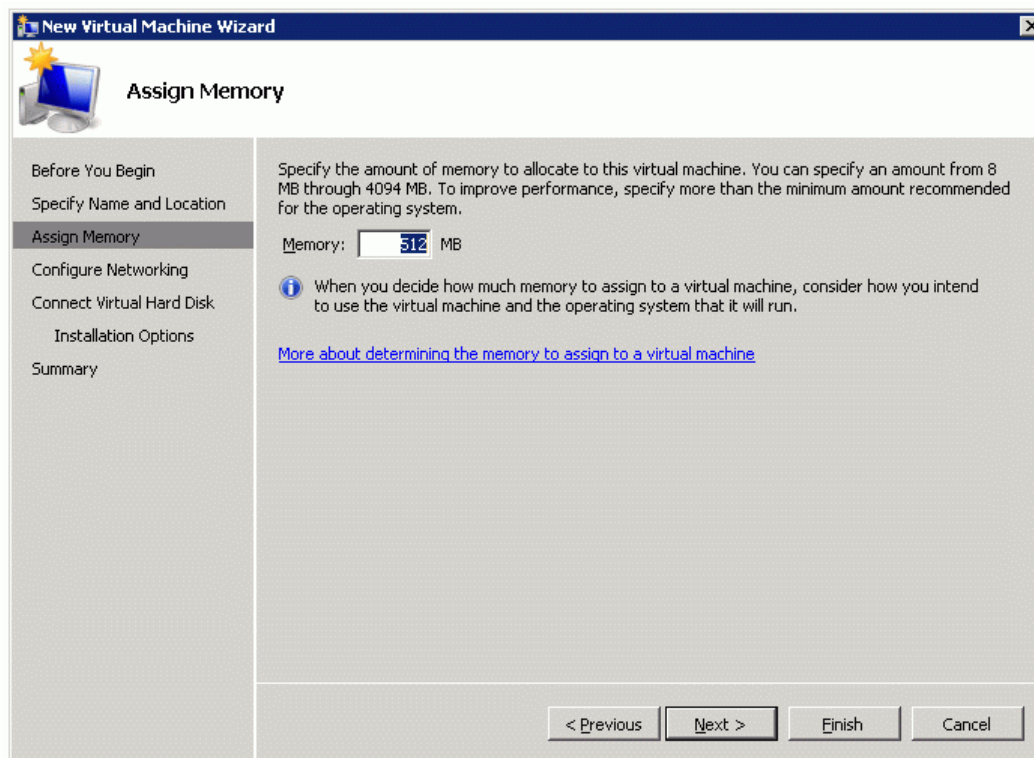
Displays the new virtual machine wizard.

3. Specify the name and location of the virtual machine.



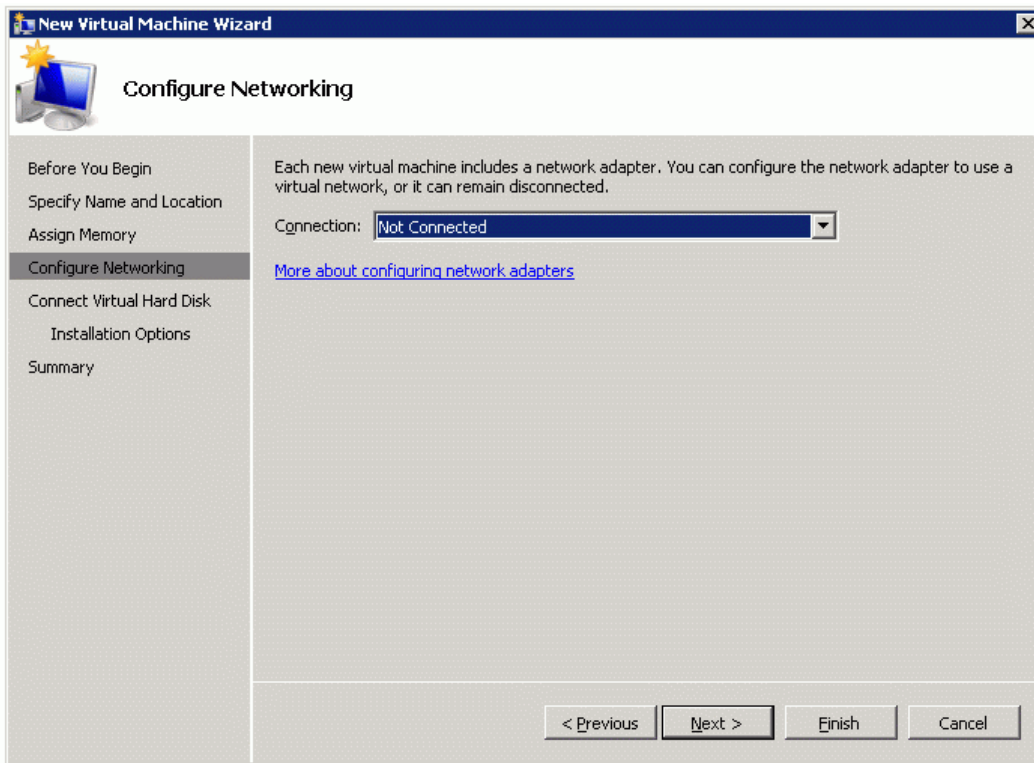
4. Click **Next** to continue.

5. Define the amount of memory to allocate to the virtual machine.



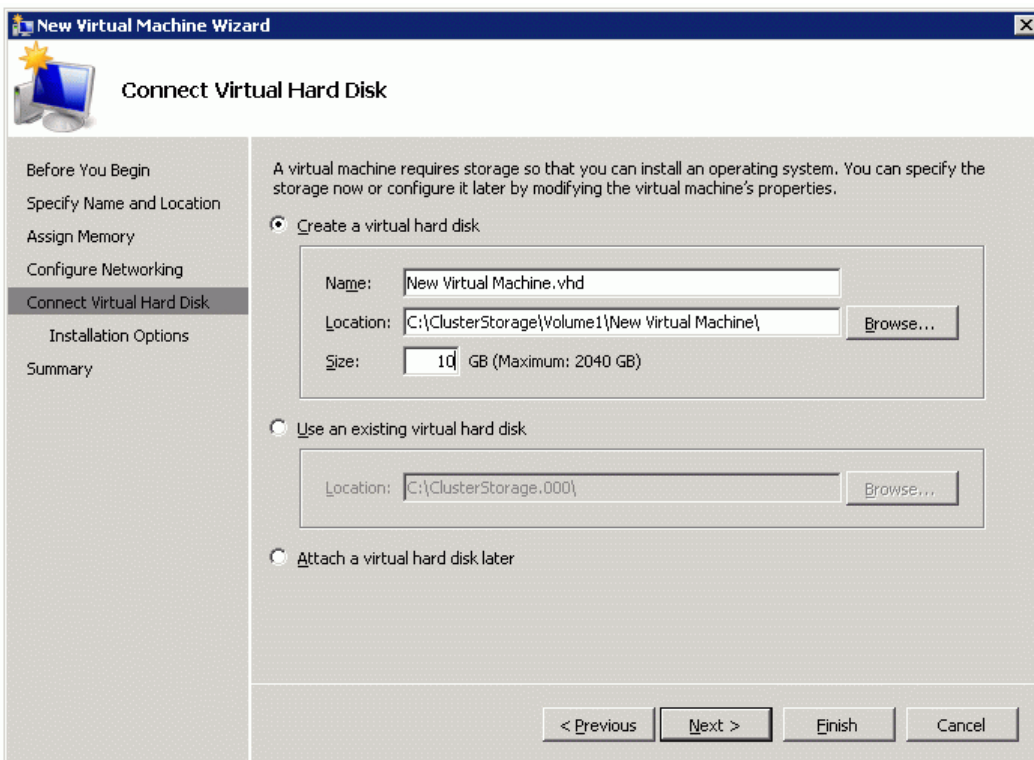
6. Click **Next** to continue.

7. Specify the necessary network connection options or leave the default parameters unchanged.



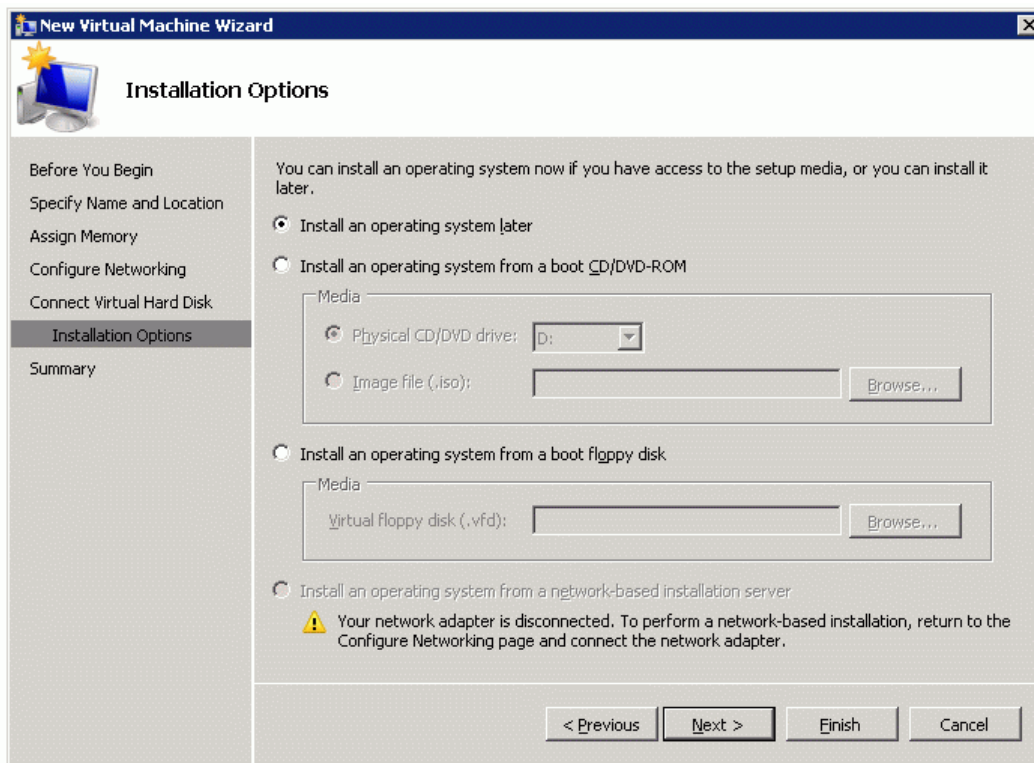
8. Click **Next** to continue.

9. Specify name, size and location of the virtual disk.



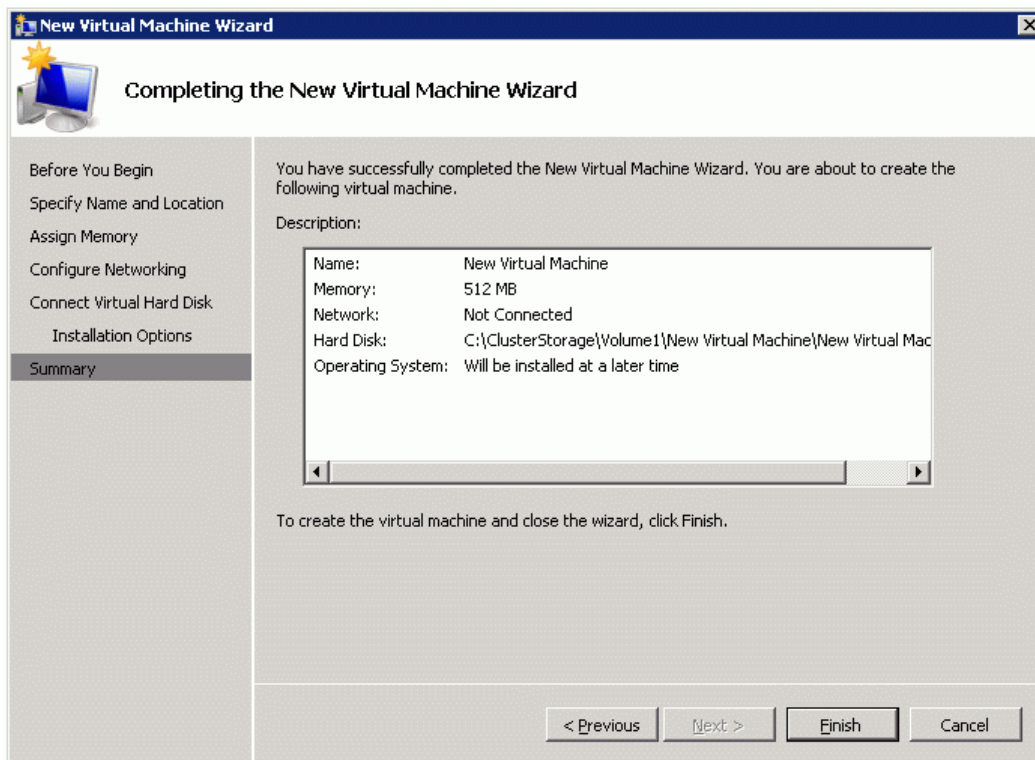
10. Click **Next** to continue.

11. Specify the installation options of the operating system or leave the default parameters unchanged.



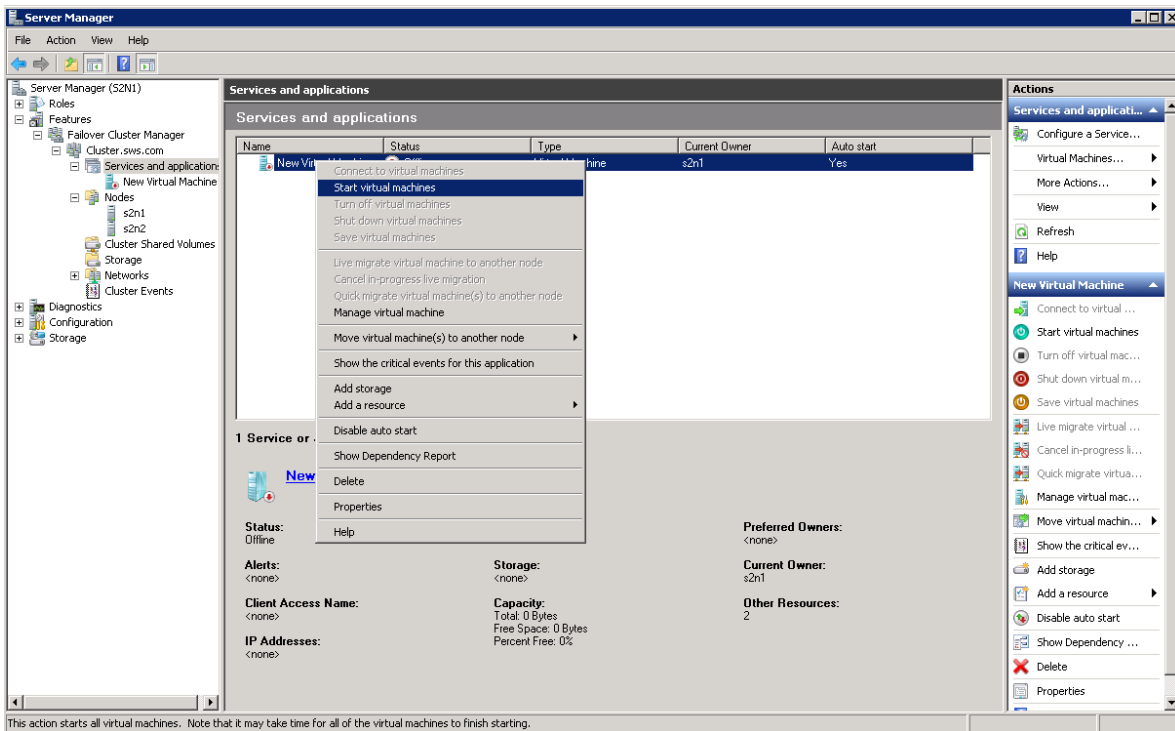
12. Click **Next** to continue.

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

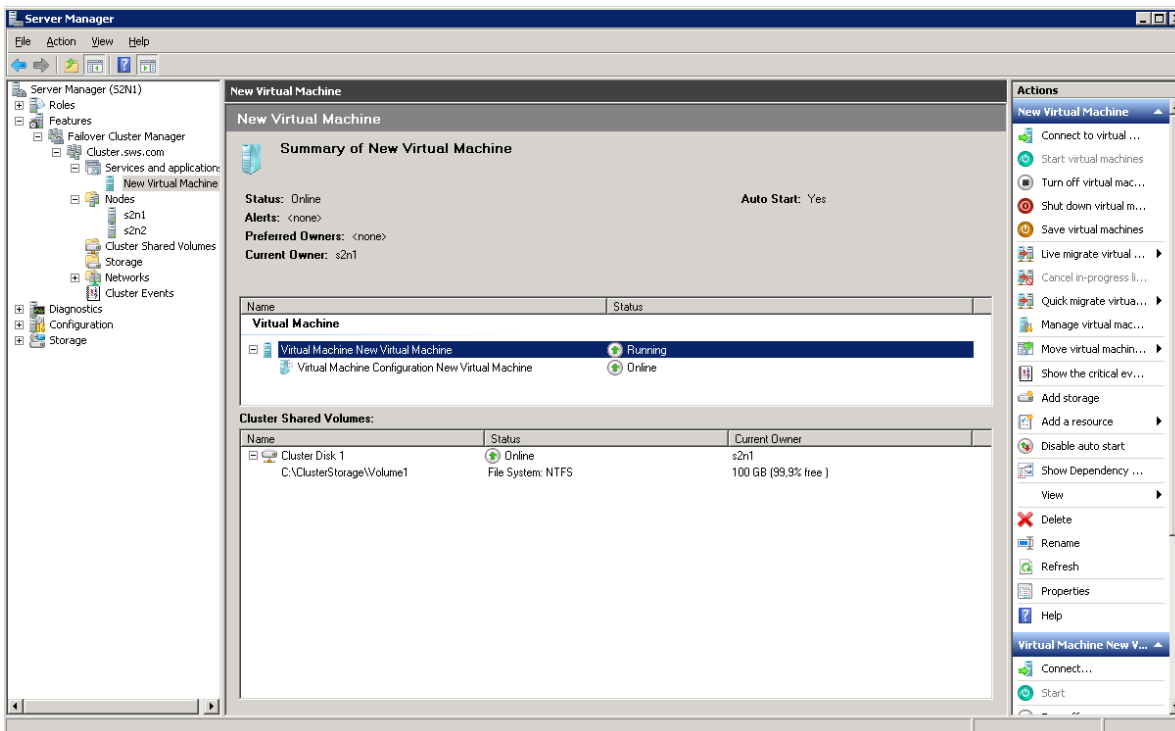


14. Click **Finish** to close the wizard.

15. Right-click the added virtual machine, and click **Start virtual machines**. The **Server Manager** window appears.



16. Check whether the virtual machine is running and operating successfully.



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