

StarWind iSCSI SAN & NAS:

Configuring 3-Node HA Storage for Live Migration on Windows Server 2012
December 2012

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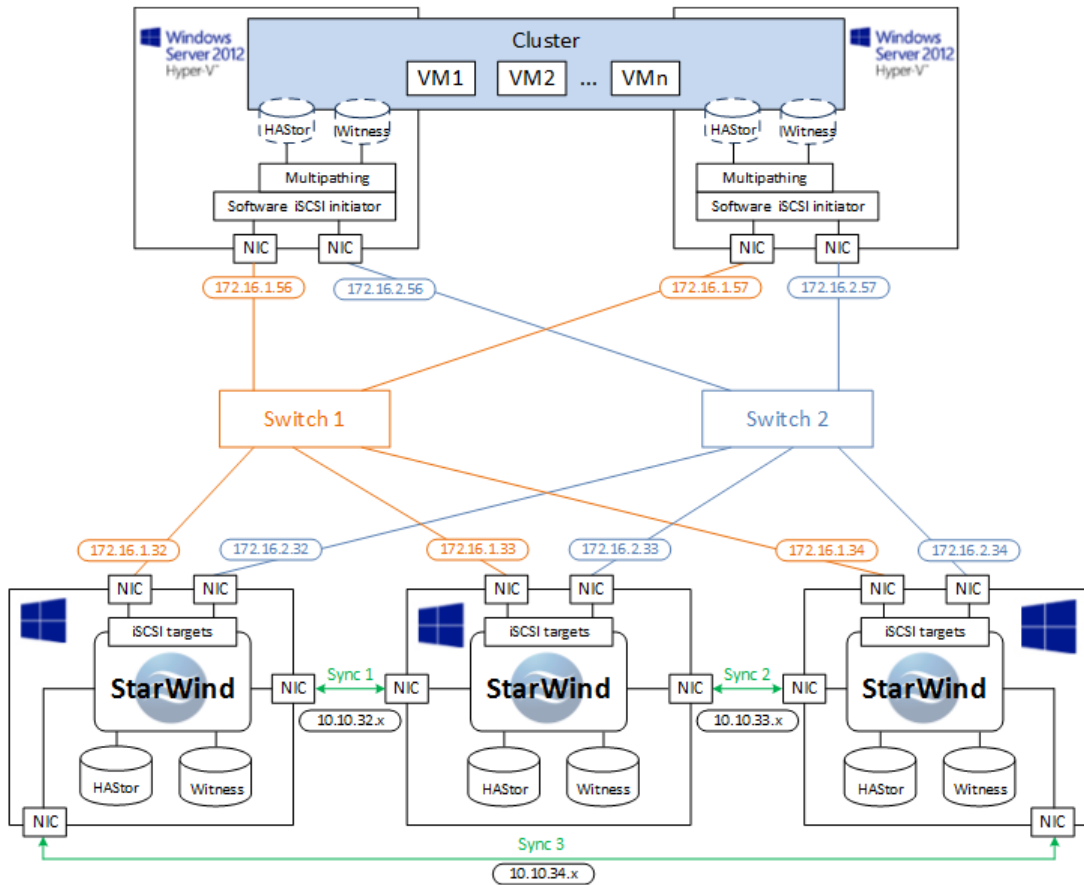
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INTRODUCTION



CREATING AN HA DEVICE

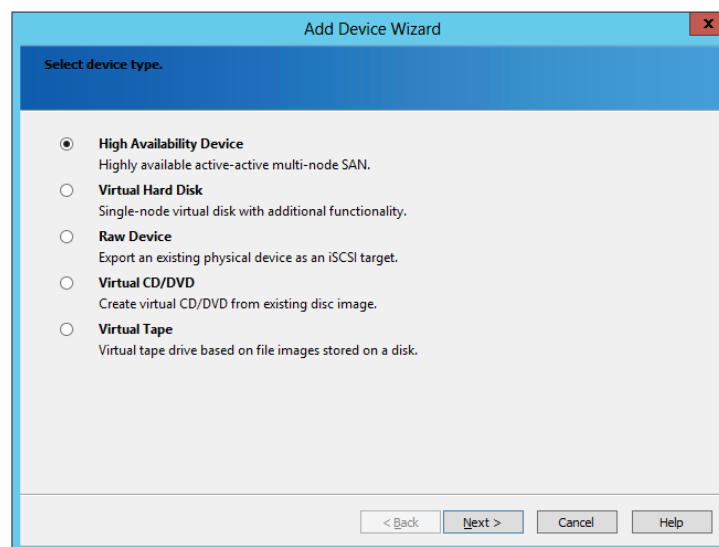
1. Open a StarWind configuration file. The default path is C:\Program Files\StarWind Software\StarWind\StarWind.cfg.
2. Find the string "`<!--<iScsiDiscoveryListInterfaces value="1"/> -->`" and uncomment it (it should look in the following way: `<iScsiDiscoveryListInterfaces value="1"/>`).
3. Restart **StarWind Service** and repeat the same procedure on another StarWind HA node.
4. Launch **StarWind Management Console: Start -> All Programs -> StarWind Software -> StarWind**.

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

5. Select the server you want to provide with the iSCSI target device from the **Console tree**. Double-click the host to connect.

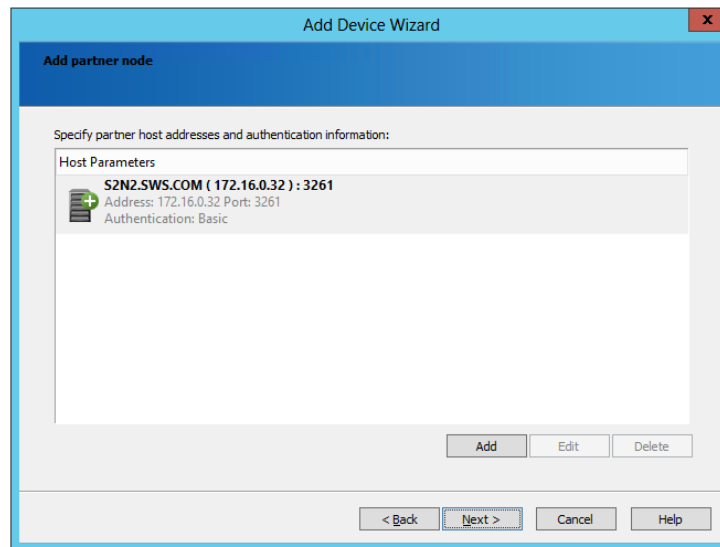
Note: If you are prompted to enter login and password, specify "root" and "starwind", respectively. These are the default login and password, but you can always change them later.

6. After connecting to **StarWind Service**, you can create devices and targets on the server. Open **Add Device Wizard** by one of the following ways:
 - Select **Add Device** from the **Target** menu.
 - Select **Add Device** from the **Devices** shortcut menu (right-click to open it).
7. **Add Device Wizard** appears. Please, follow the wizard's steps to create a new HA device.
8. Select **High Availability Device**.

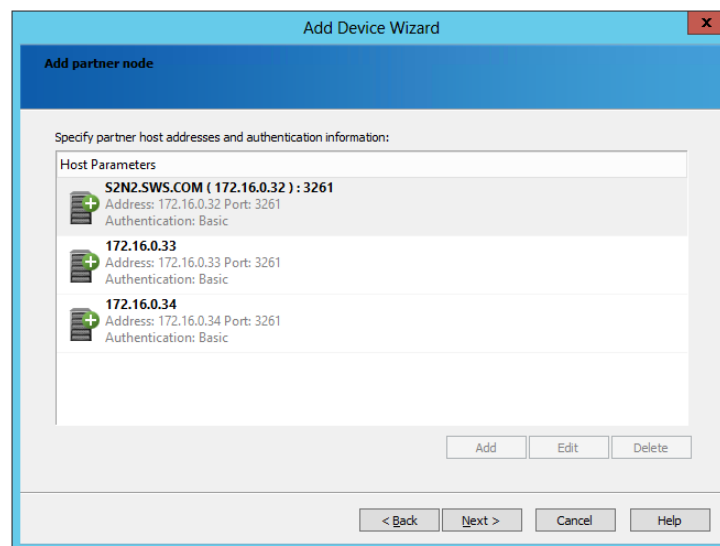


9. Click **Next** to continue.

10. Click **Add** to add a new host.




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

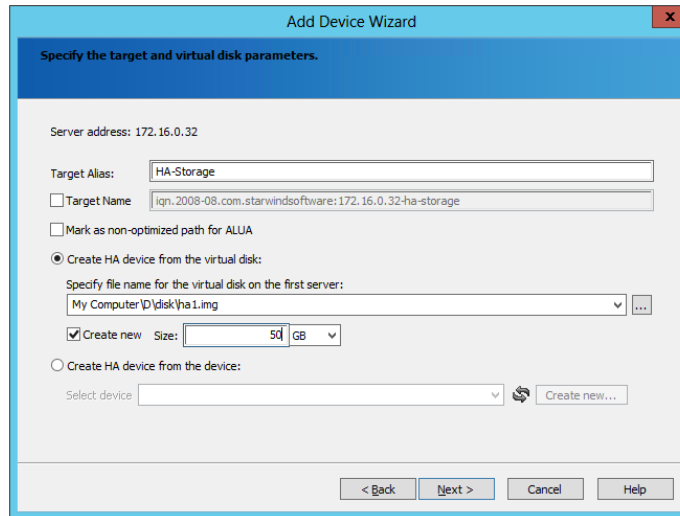


12. Click **Next** to continue.

13. Specify the corresponding information in the **Target Alias** and **Target Name** text fields.

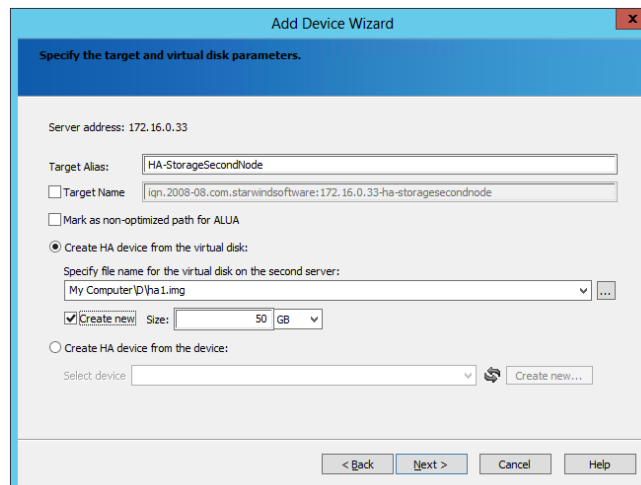
Note: The name must be unique. Under this name the device is declared to iSCSI initiators that are connected to **StarWind Service** over an IP network.

14. Click  to specify a name and location of an HA virtual disk on the server. If you want to create a new virtual disk, select the **Create New** checkbox.

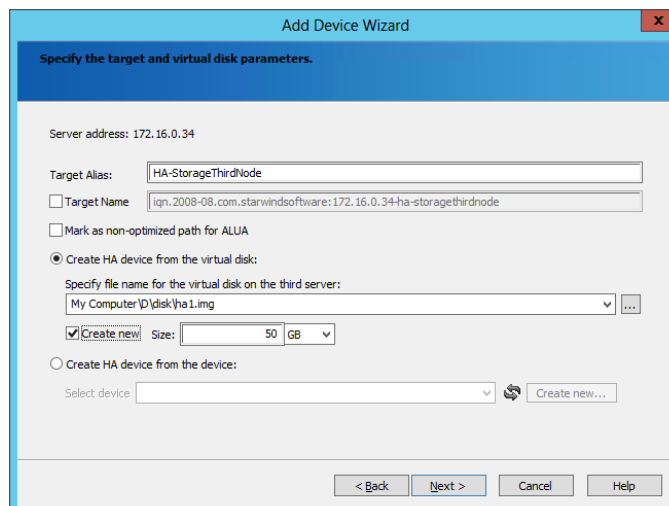


15. Click **Next** to continue.

16. Specify target and virtual disk parameters of the second node.



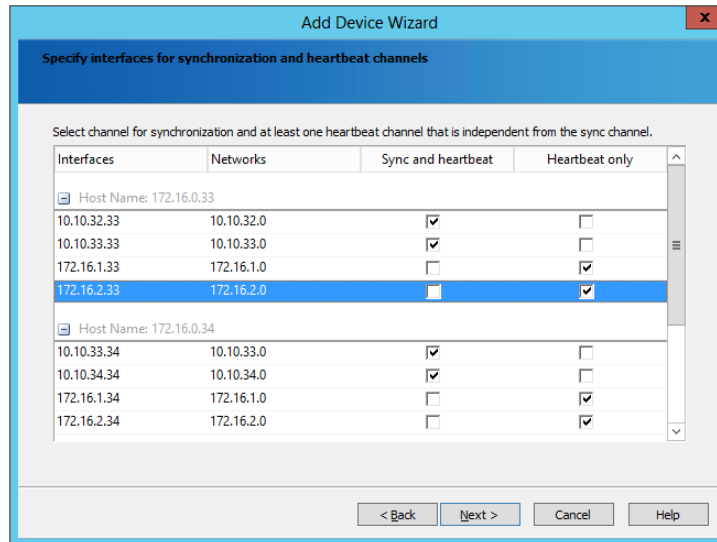
17. Specify target and virtual disk parameters of the third node.



18. Click **Next** to continue.

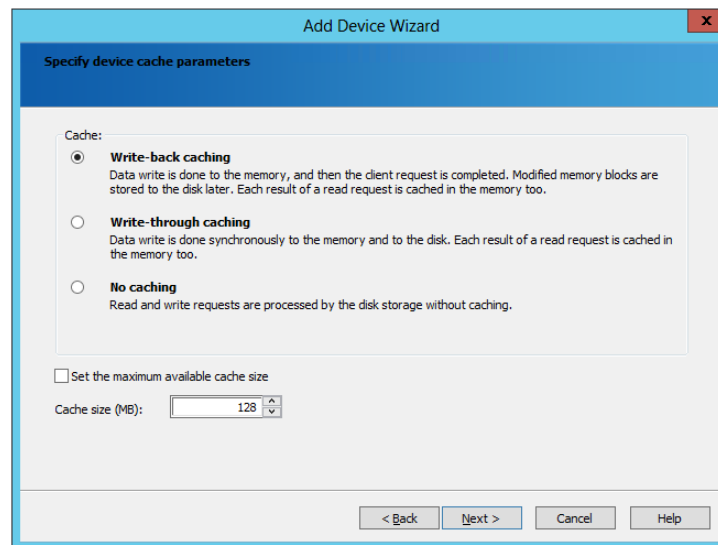
19. Configure data synchronization and Heartbeat channel parameters.

Note: At least one Heartbeat channel must be separated from the synchronization channel due to availability considerations.



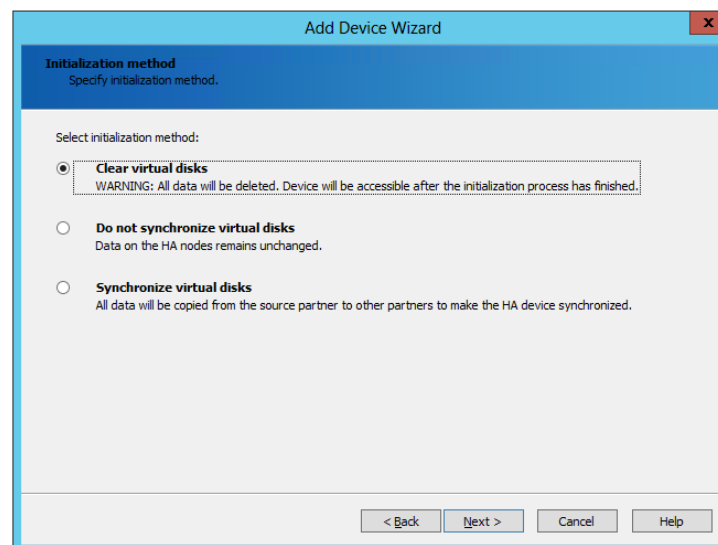
20. Click **Next** to continue.

21. Specify cache parameters of the HA device.



22. Click **Next** to continue.

23. Select an initialization method of the HA device.



24. Check whether device parameters are correct. Click **Back** to make any changes. Click **Next** to continue.

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

Follow the similar procedure to create the second HA device that will be used as a witness disk.

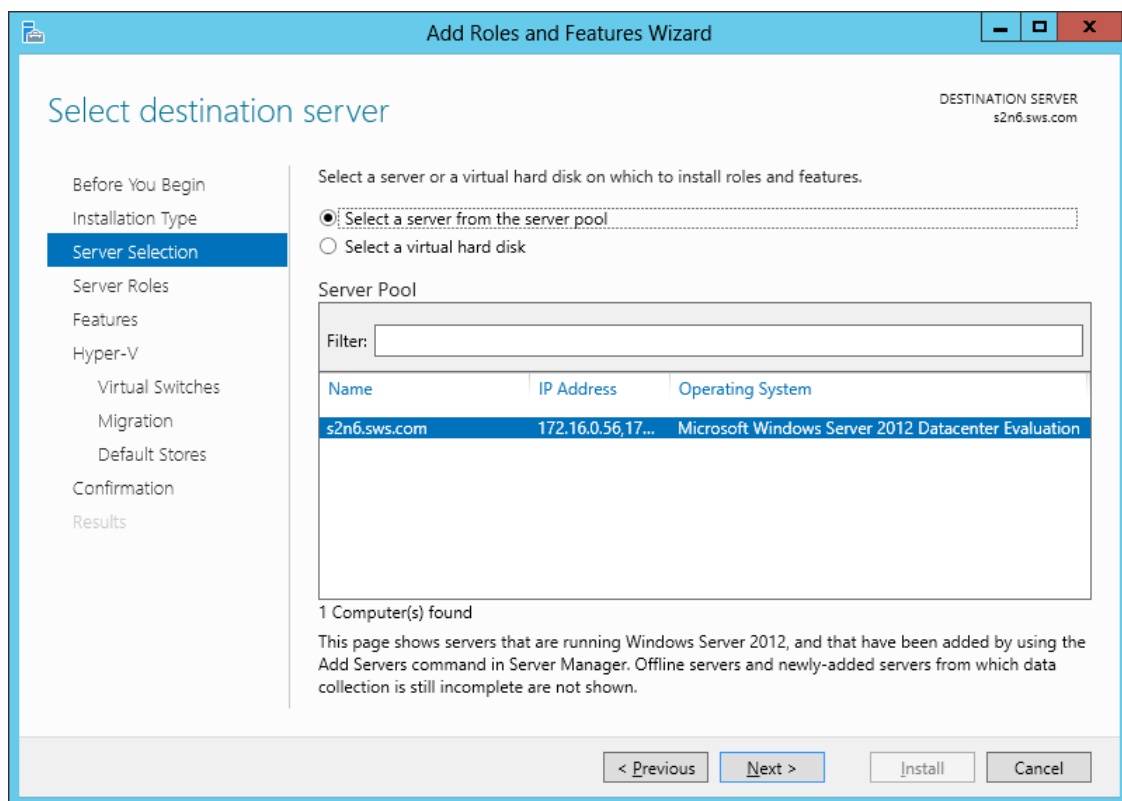
CONFIGURING HYPER-V SERVERS

Note: This document assumes that you have already configured Active Directory and two servers in the domain. It also assumes that you have enabled the **Failover Clustering, Multipath I/O** features and the **Hyper-V** role on the both servers. These configurations can be made using **Server Manager** (the **Add Roles and Features** option).

1. Launch **Server Manager**, select the **Manage** item, and click the **Add Roles and Features** option. Install the **Hyper-V** role, **Multipath I/O** and **Failover Clustering** features following the wizard's steps.

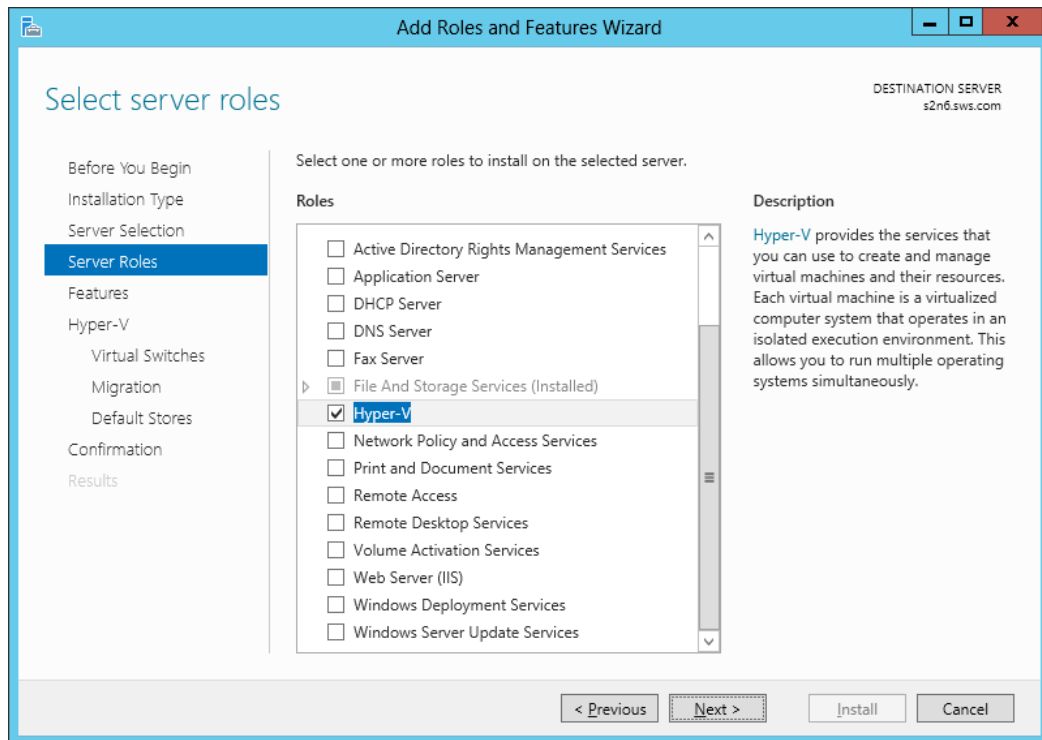
Note: Restart the server after installation is completed.

2. Select **Role-based or feature-based installation** as an installation type and click **Next** to continue.
3. Select a server from the server pool. Use a filter to find an appropriate server.

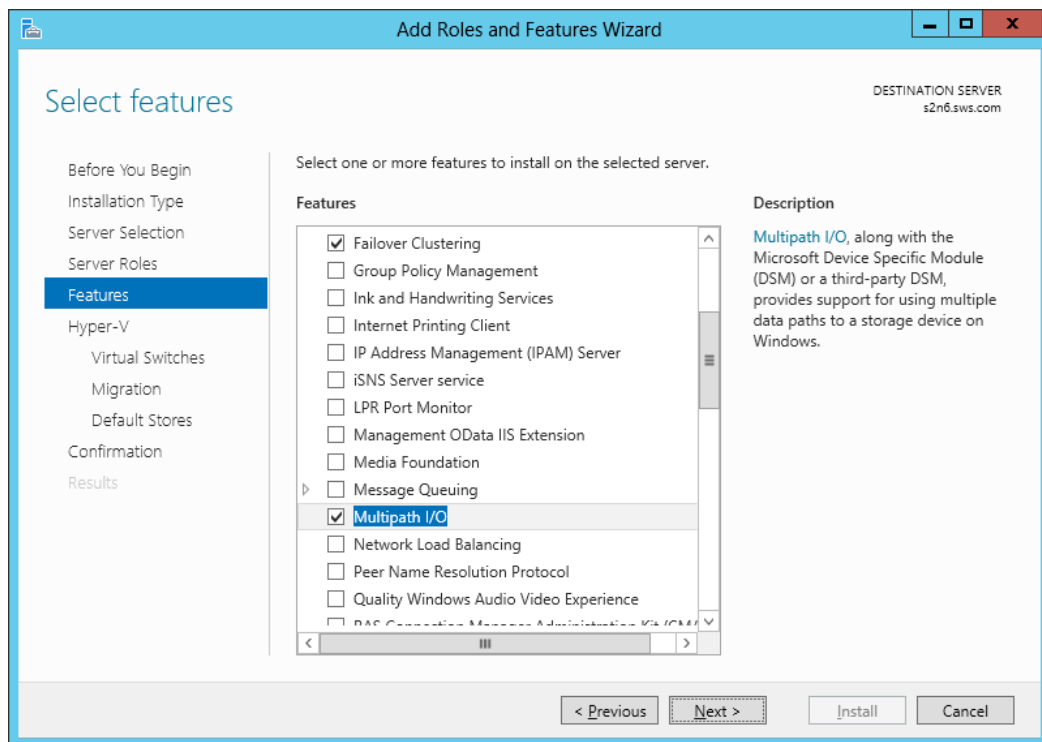


4. Click **Next** to continue.

5. Select the **Hyper-V** checkbox in the **Server Roles** section.

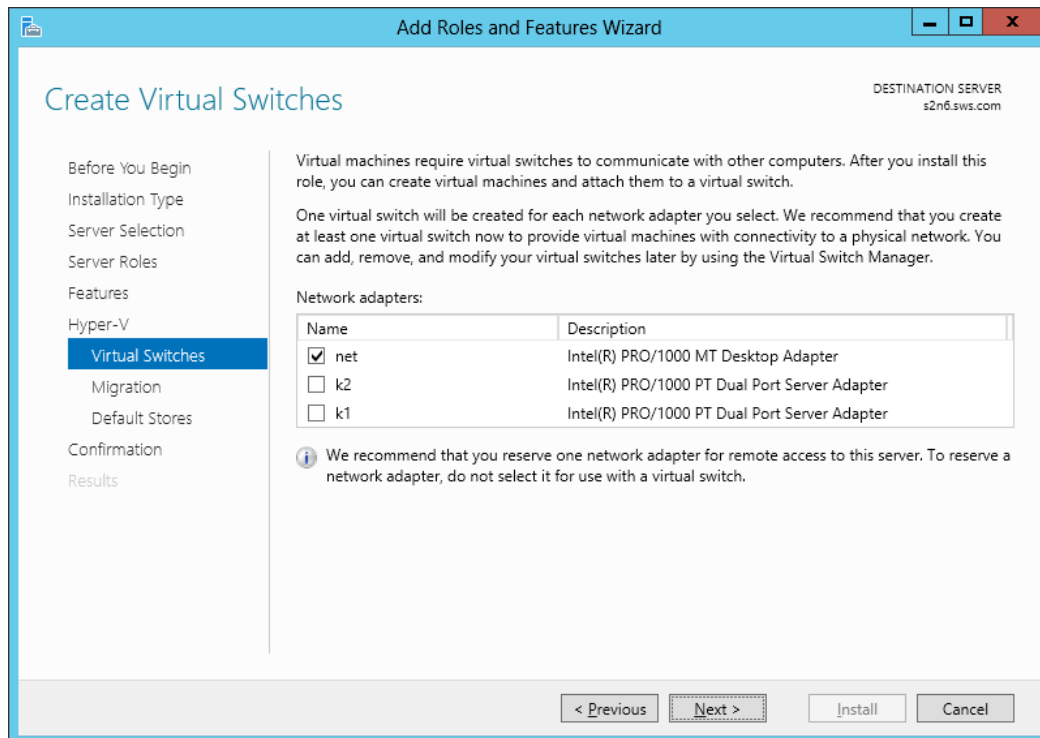


6. Click **Next** to continue.
7. Select **Failover Clustering** and **Multipath I/O** checkboxes in the **Features** section.



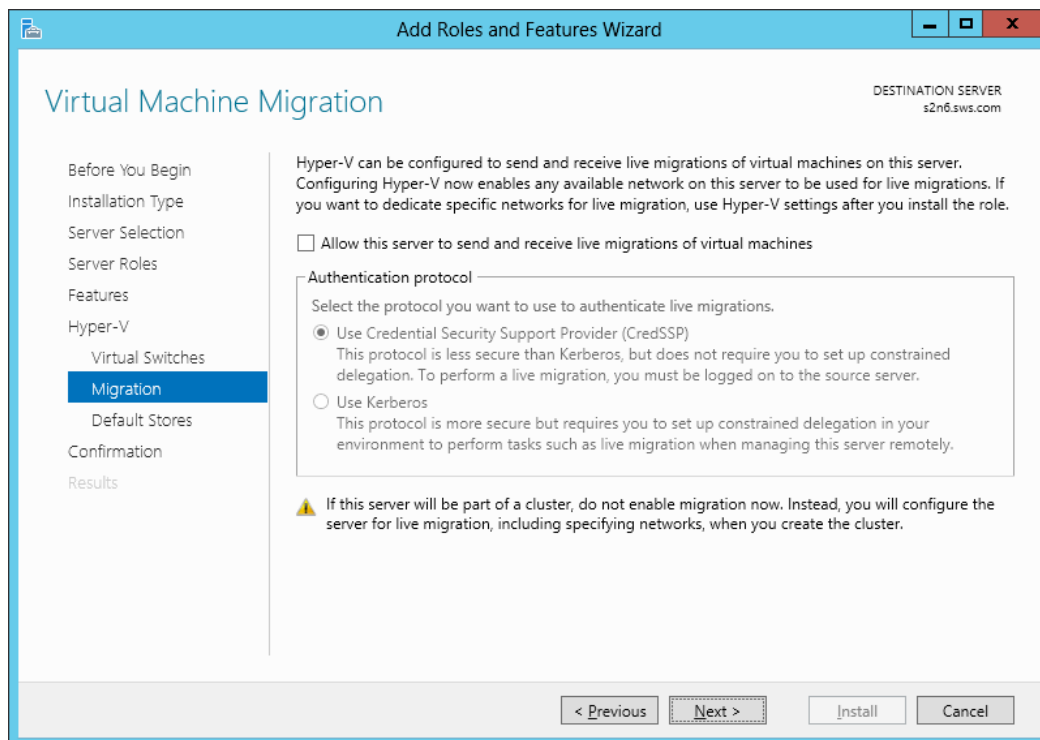
8. Click **Next** to continue.

9. Select network adapters for virtual switches in the **Virtual Switches** section.



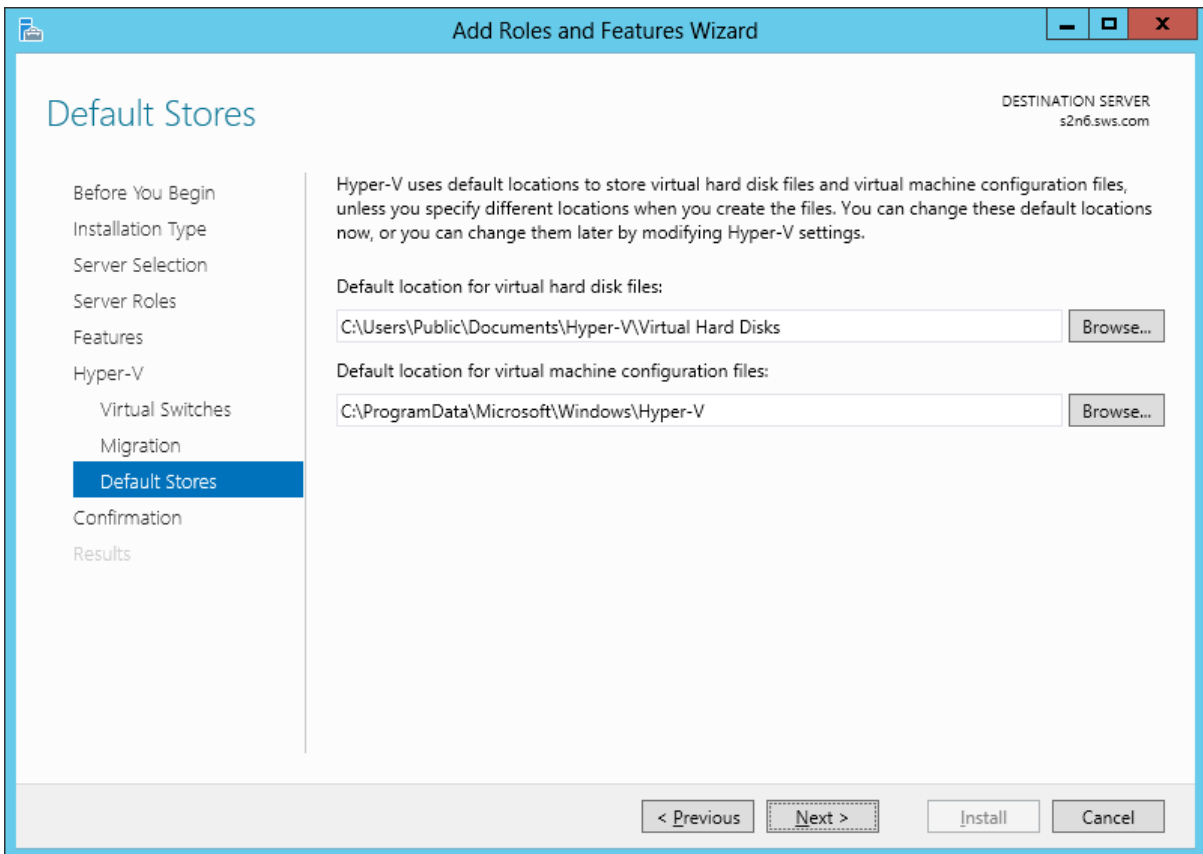
10. Click **Next** to continue.

11. Select settings of VM live migration in the **Migration** section.



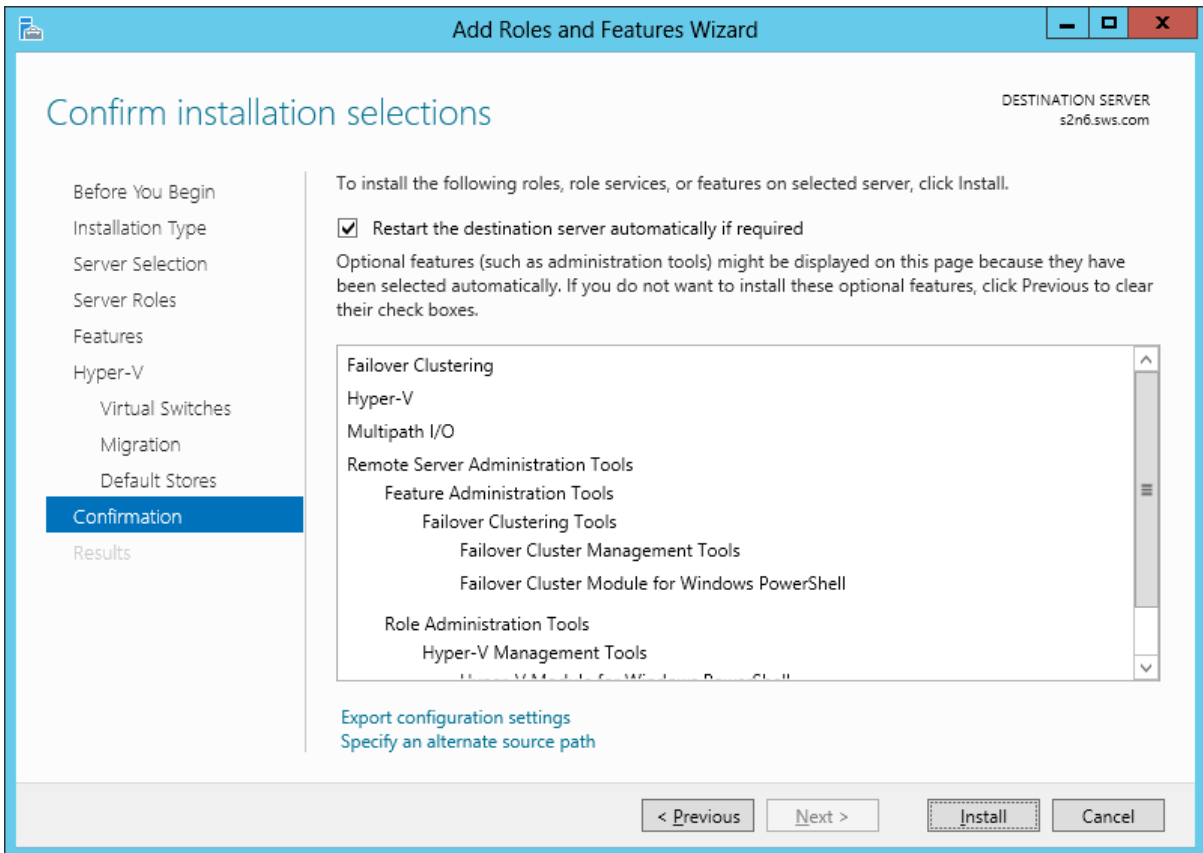
12. Click **Next** to continue.

13. Select location of virtual hard disk files in the **Default Stores** section.



14. Click **Next** to continue.

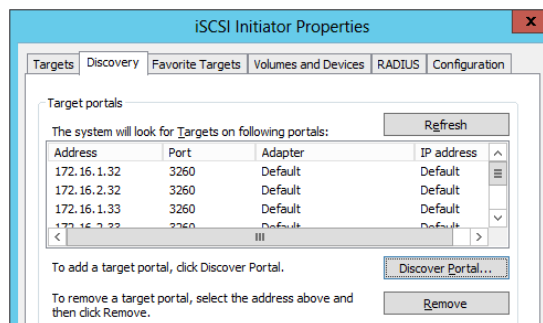
15. Select the corresponding checkbox to restart the server automatically, and click **Install**. Otherwise, click **Install** and restart server manually after the installation is completed.



CONNECTING TARGETS

To connect the previously created disks on all servers that will be added to the cluster:

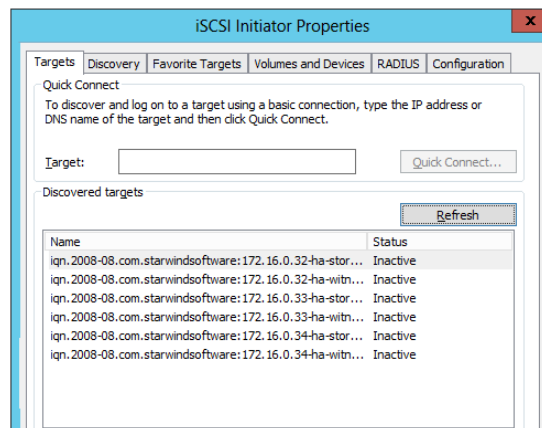
1. Launch **Microsoft iSCSI Initiator: Start > Administrative Tools > iSCSI Initiator**. The **iSCSI Initiator Properties** window appears.
2. Navigate to the **Discovery** tab.
3. Click **Discover Portal**. Enter an IP address of each StarWind Server in the appropriate field of the **Discover Target Portal** dialog. Click **OK**.



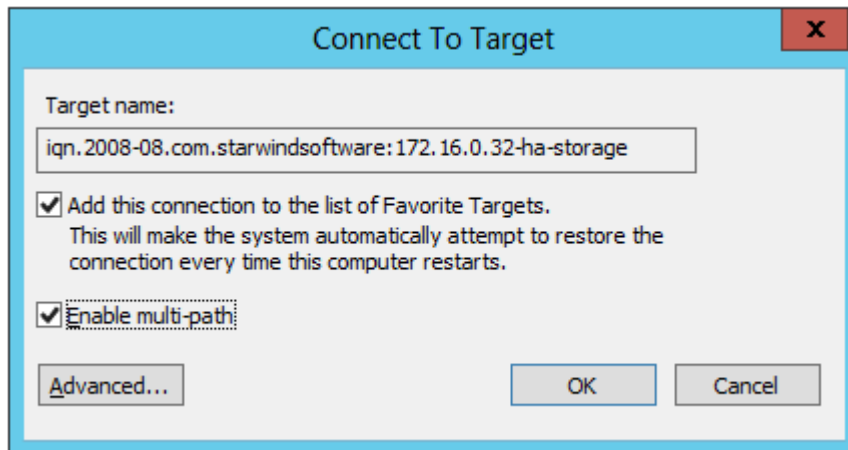
4. Click the **Targets** tab. The previously created targets are listed in the **Discovered Targets** section.

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**).

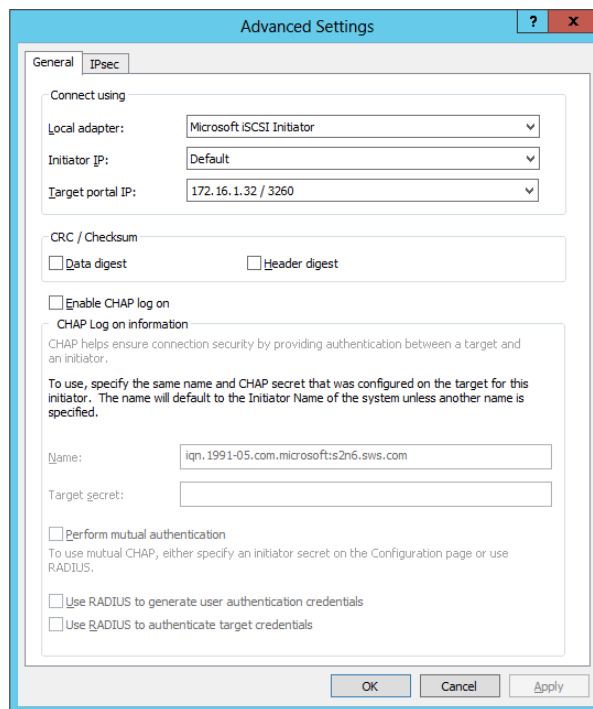
5. Select each of the targets and click **Connect** to add them.



6. Select **Add this connection to the list of Favorite Targets** and **Enable multi-path** checkboxes in the **Connect to Target** dialog. Click **Advanced**.

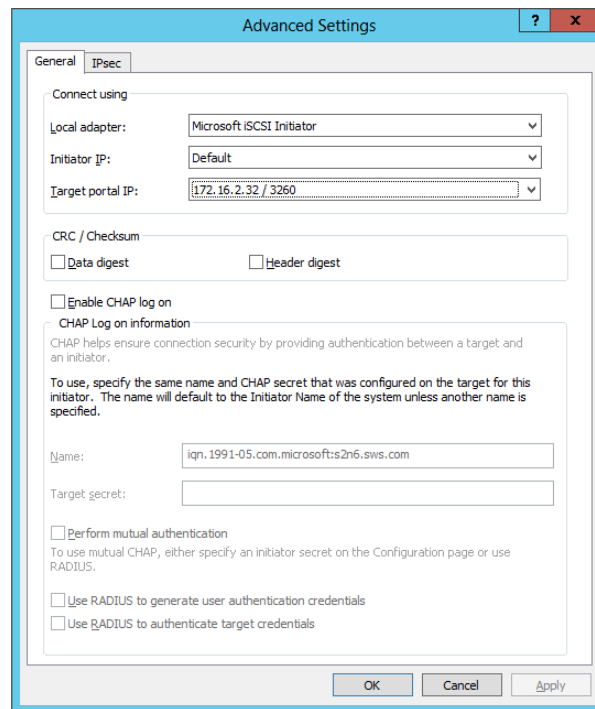


7. Choose the **Microsoft iSCSI Initiator** option from the **Local adapter** drop-down list. From the **Target portal IP** choose the first portal IP. Click **OK**.



8. Select the same target and click **Connect** again. Perform the actions described in steps 6-7 of this section. This time specify another IP address as a target portal IP.

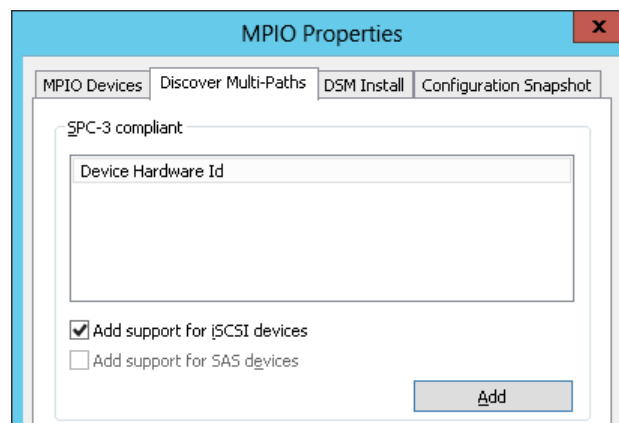
9. Click **OK**.



10. Repeat the actions described in the steps 5-8 for each target.

11. Open **MPIO manager: Start -> Administrative Tools -> MPIO**.

12. Go to the **Discover Multi-Paths** tab. Select the **Add support for iSCSI devices** checkbox and click **Add**.



13. When prompted to restart the server, click **Yes** to proceed. After the server restarts, initialize the disk and create partitions, as if it was a physical hard drive.

INITIALIZING DISKS

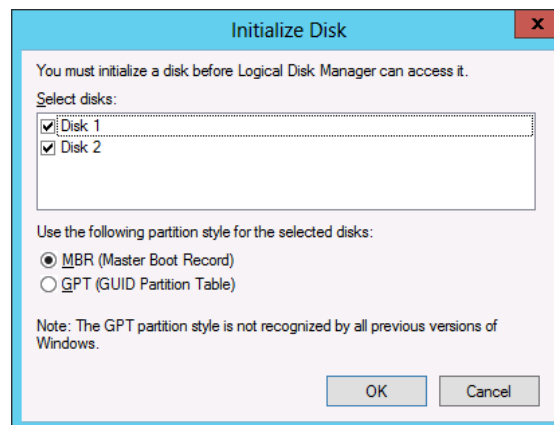
Note: The **StarWind** disks must be initialized and formatted, before you can use them as cluster disks.

Note: Changes made to the first node (e.g. initialization or partition) are applied to the second node as soon as it is brought online.

To initialize disks and create partitions:

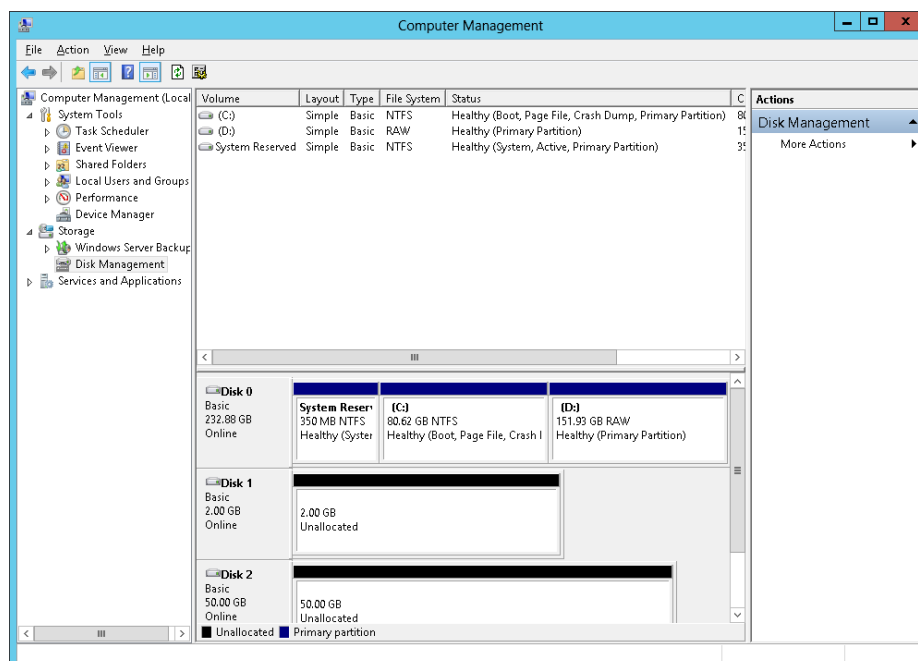
1. Launch the **Computer Management** console.
2. Go to **Storage -> Disk Management**.
3. Right-click each disk and select **Online Disk** to bring it online.
4. Right-click each disk and select **Initialize Disk**. Follow the wizard's instructions to initialize disks.

Note: Select MBR (Master Boot Record) as a partition style.



5. Click **OK** to continue.

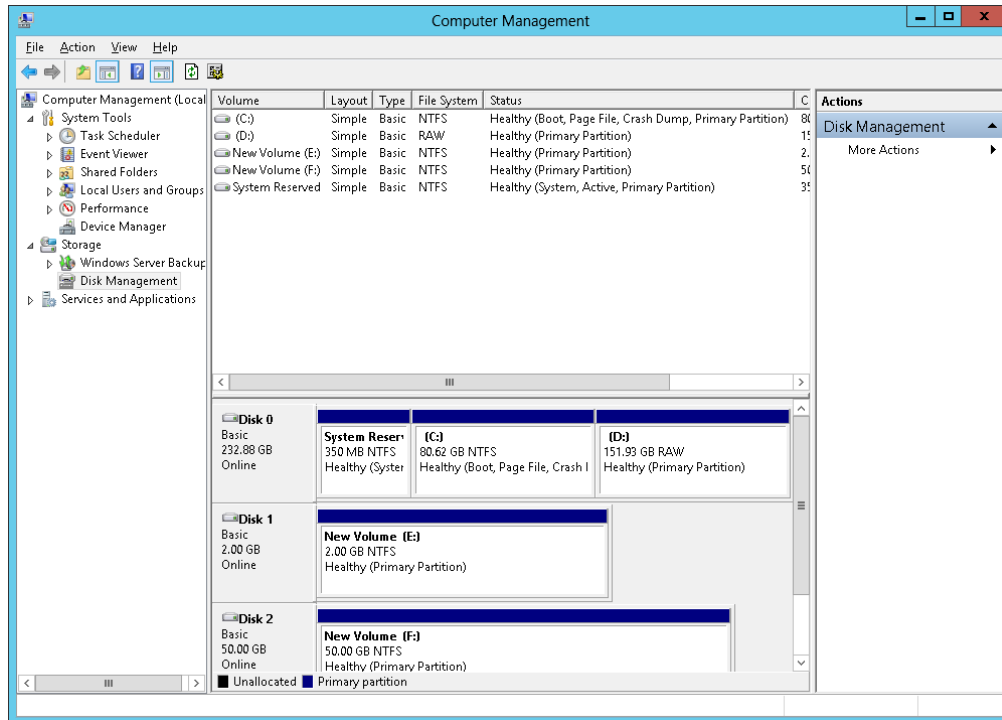
The **Computer Management** console should look as shown on the screenshot below.



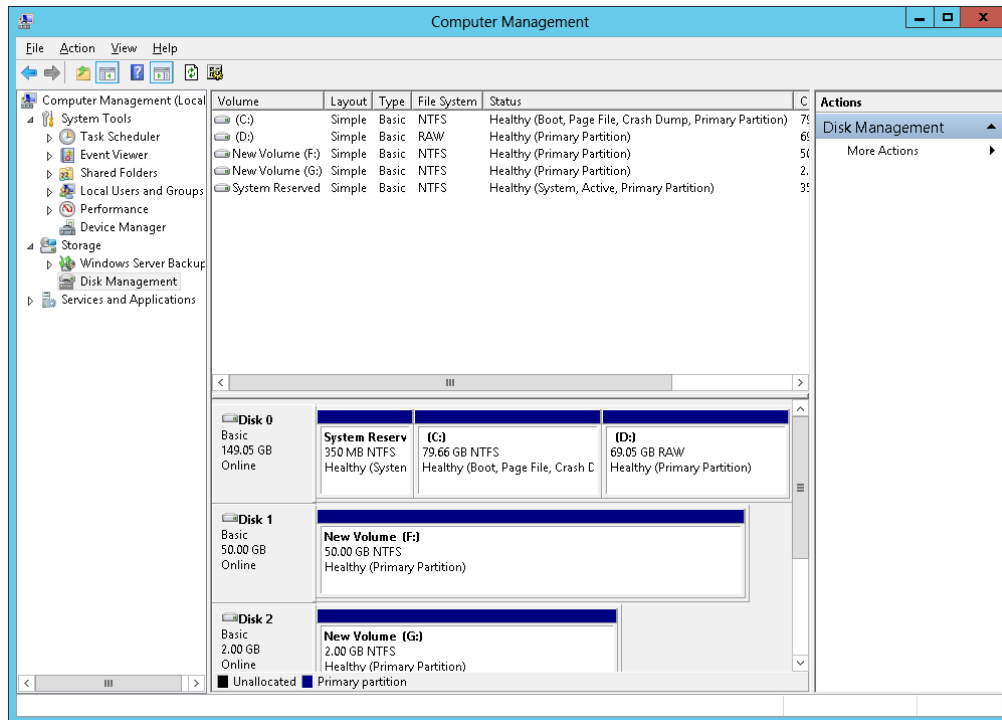
To create partitions and format new disks:

1. Right-click each disk in the **Computer Management** window and select **New Simple Volume**.
2. Follow the wizard's instructions to create partitions.

The **Computer Management** window should look as shown on the screenshot below.



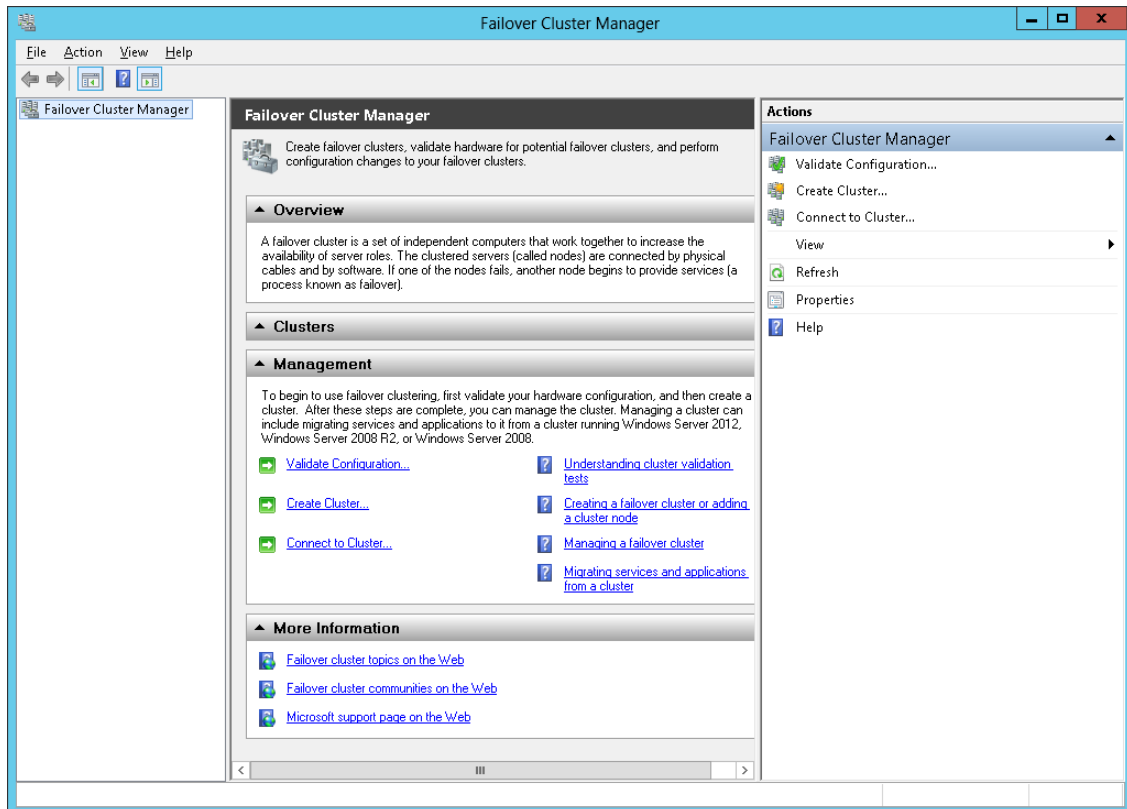
3. Carry out the same actions on other servers. You will not need to create partitions again. The **Computer Management** window should look as follows.



CREATING A CLUSTER

To validate a cluster:

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

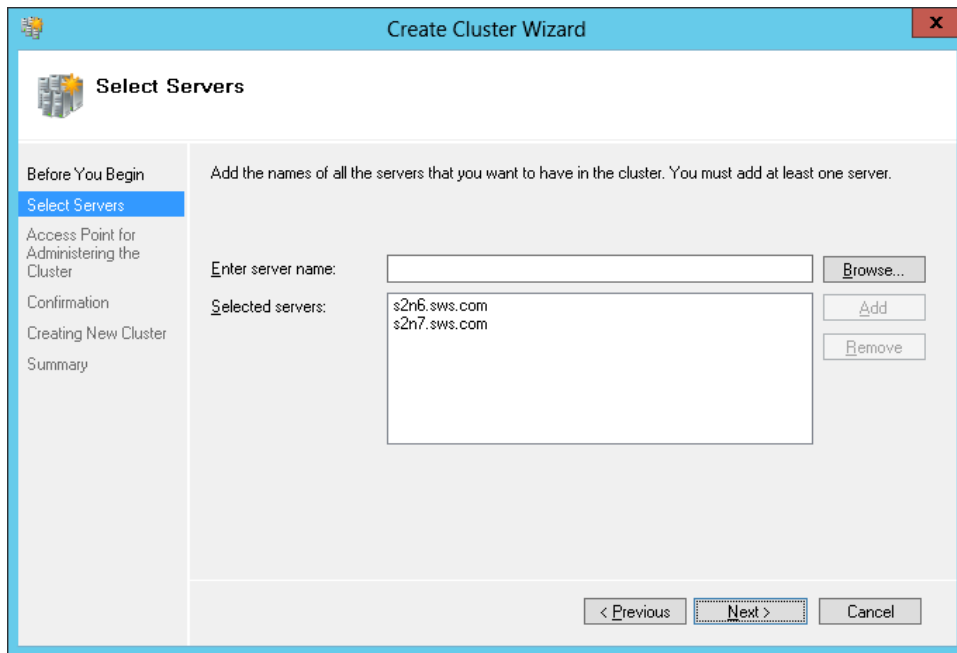


2. Before creating a cluster, verify that your servers can be used for building a cluster. Click **Validate a Configuration** in the **Actions** section.

To create a cluster:

1. Click the **Create a Cluster** item in the **Actions** section of **Failover Cluster Manager**.

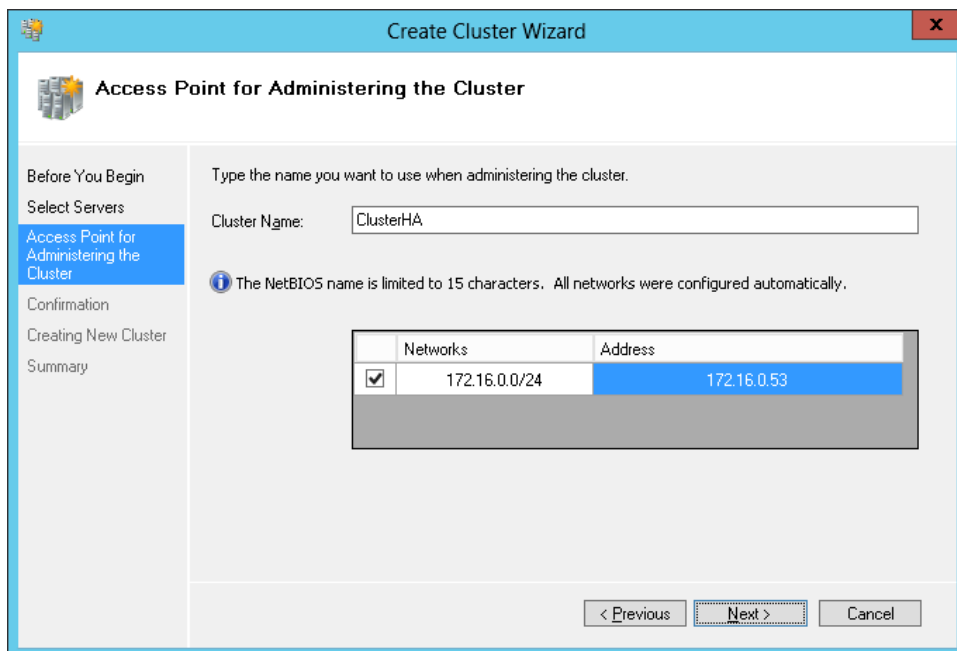
2. Specify servers to be clustered.



3. Click **Next** to continue.

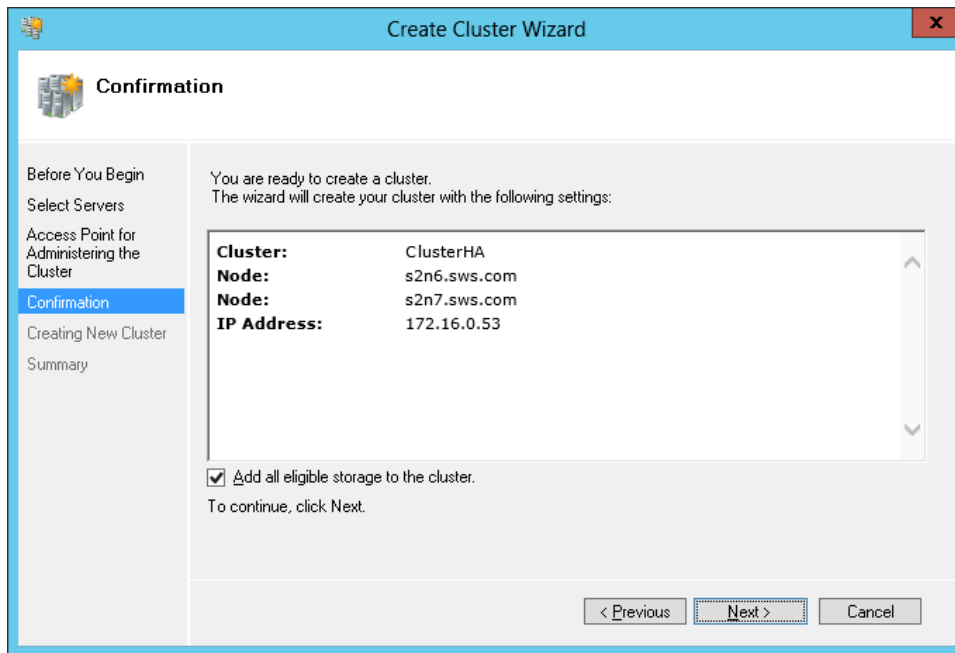
4. Specify a cluster name.

Note: If the cluster servers get IP addresses over DHCP, the entire cluster gets its IP address over DHCP as well. If the IP addresses are set statically, you will need to set a cluster IP address manually as well.

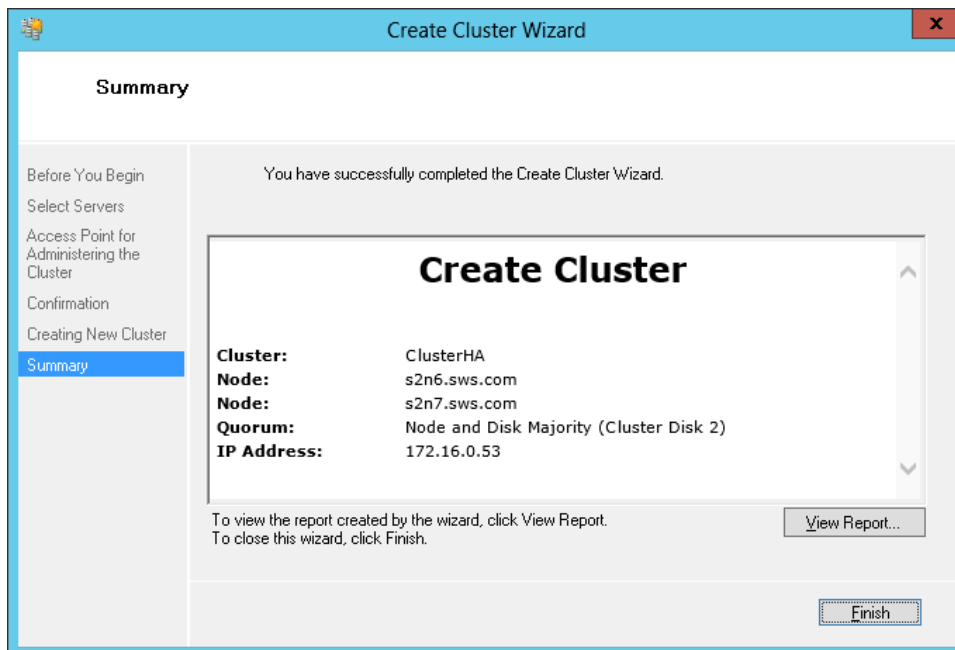


5. Click **Next** to continue.

6. Make sure that all settings are correct. Click **Previous** to make any changes. Click **Next** to continue.

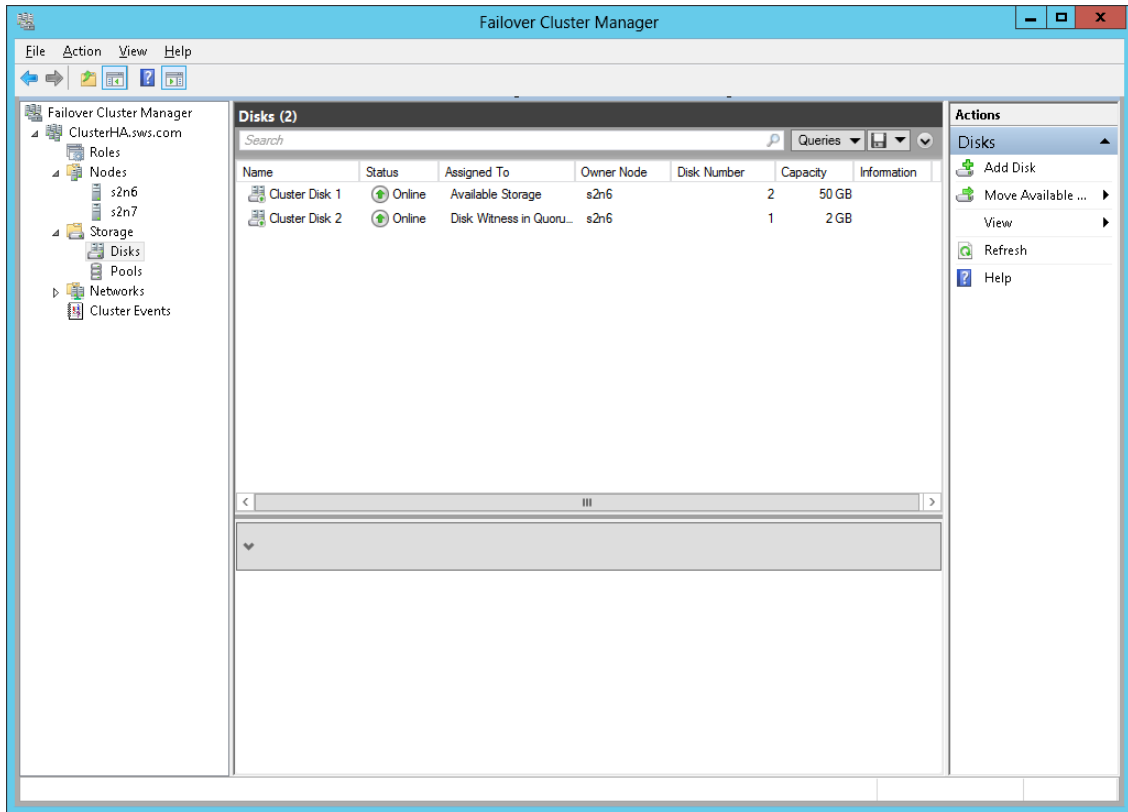


7. When the cluster is created the system displays a report with all the corresponding information.



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

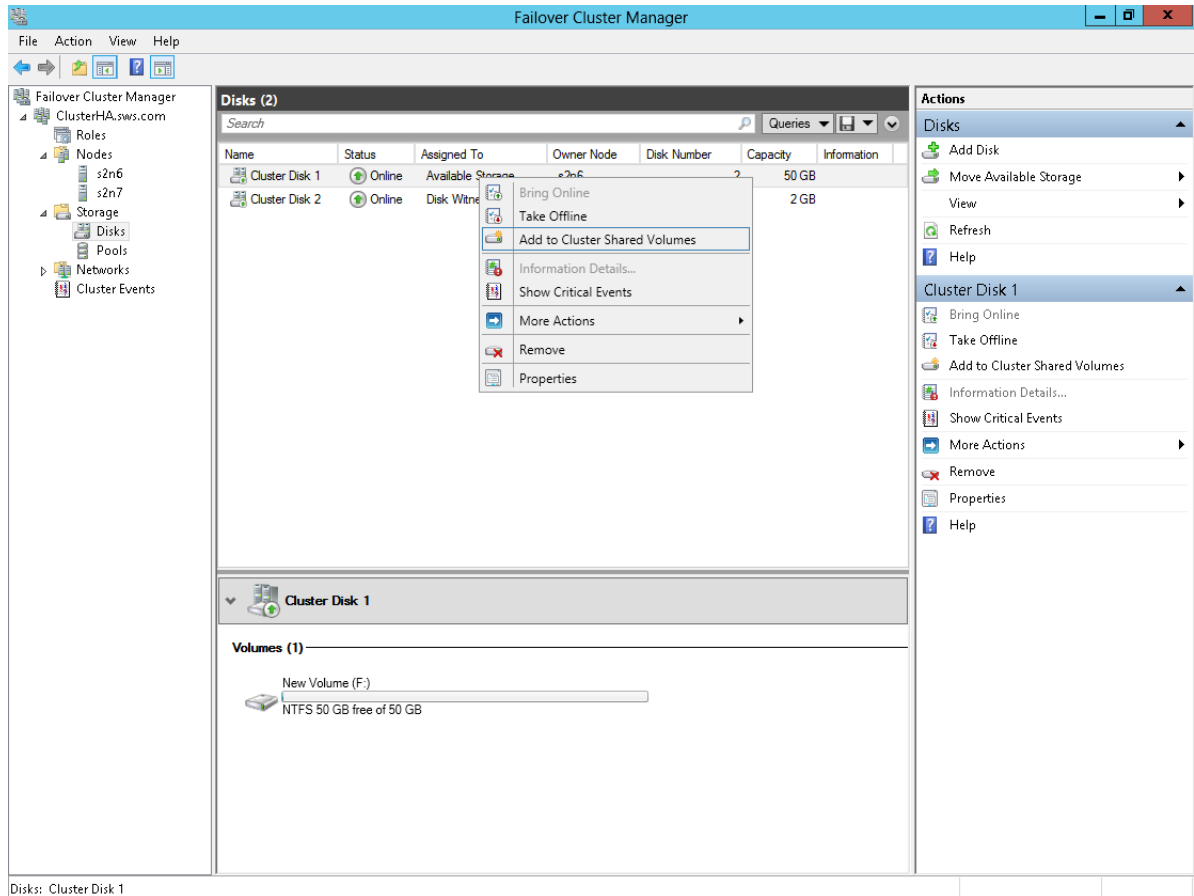
After these actions, the **Failover Cluster Manager** window should look in the following way.



ENABLING CLUSTER SHARED VOLUMES

To enable Cluster Shared Volumes (CSV) that is required for work with Hyper-V virtual machines:

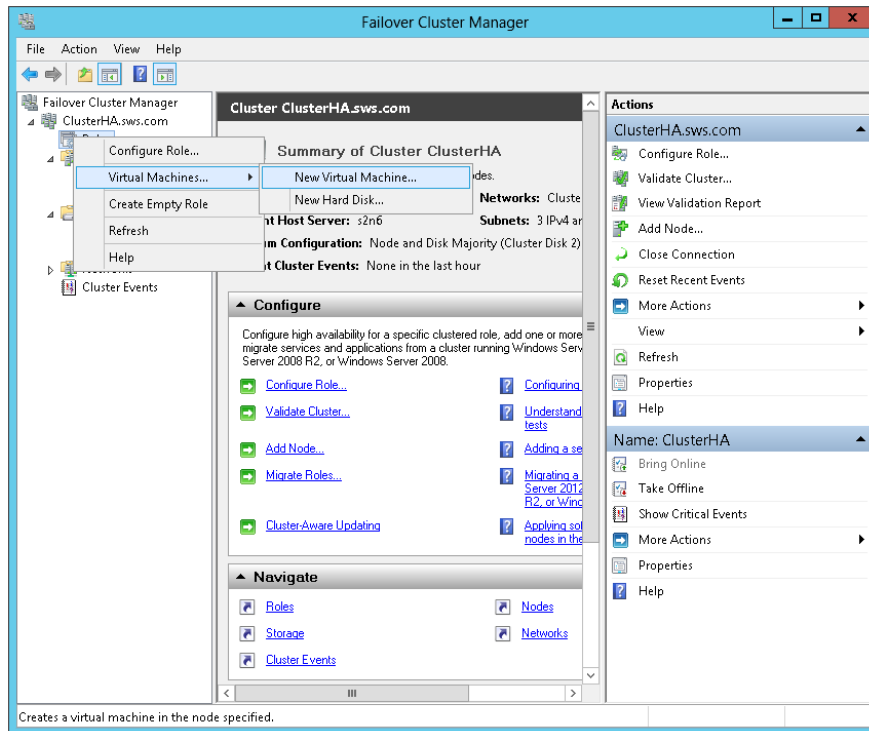
1. Open Failover Cluster Manager.
2. Go to Cluster->Storage -> Disks.
3. Right-click the needed disk and select **Add to Cluster Shared Volumes**.



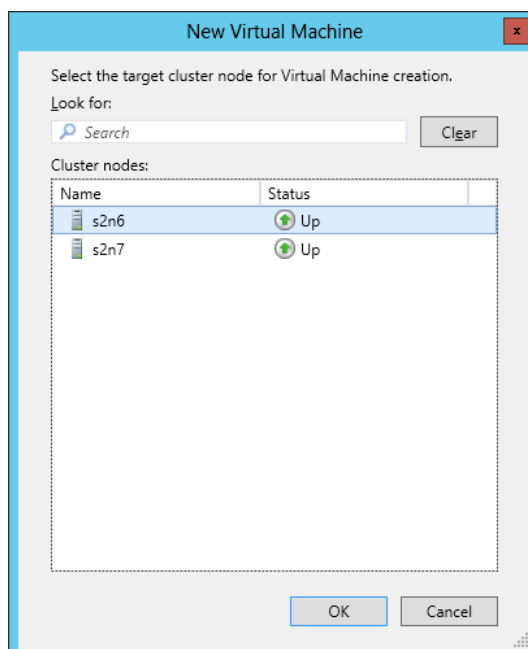
CREATING A HA VIRTUAL MACHINE

To create a HA virtual machine:

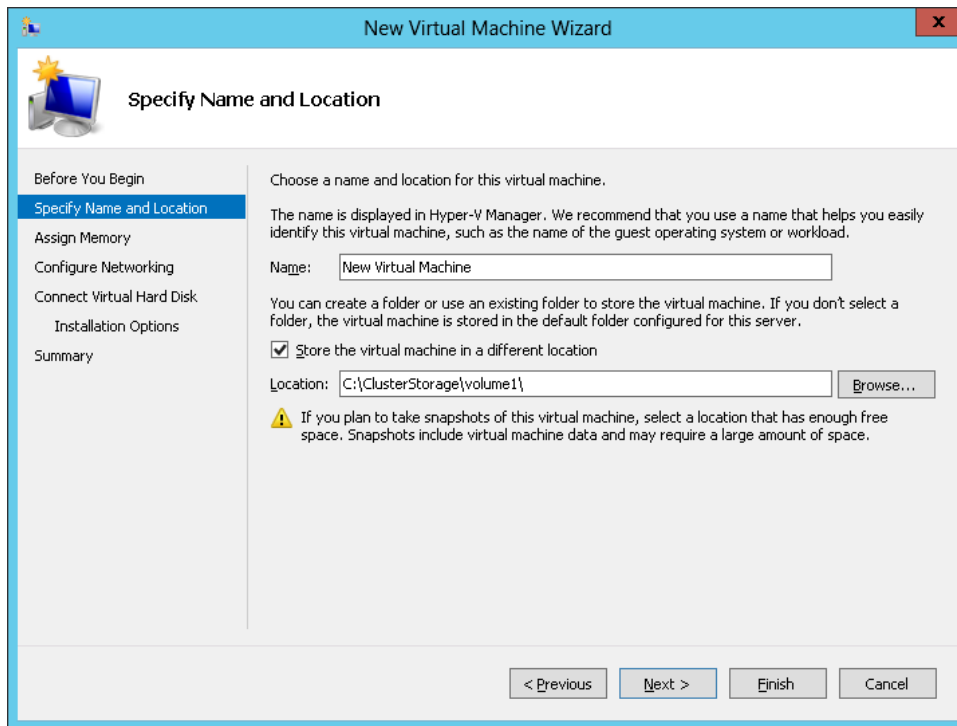
1. Launch **Failover Cluster Manager**.
2. Right-click the **Roles** item and go to **Virtual Machines -> New Virtual Machine**.



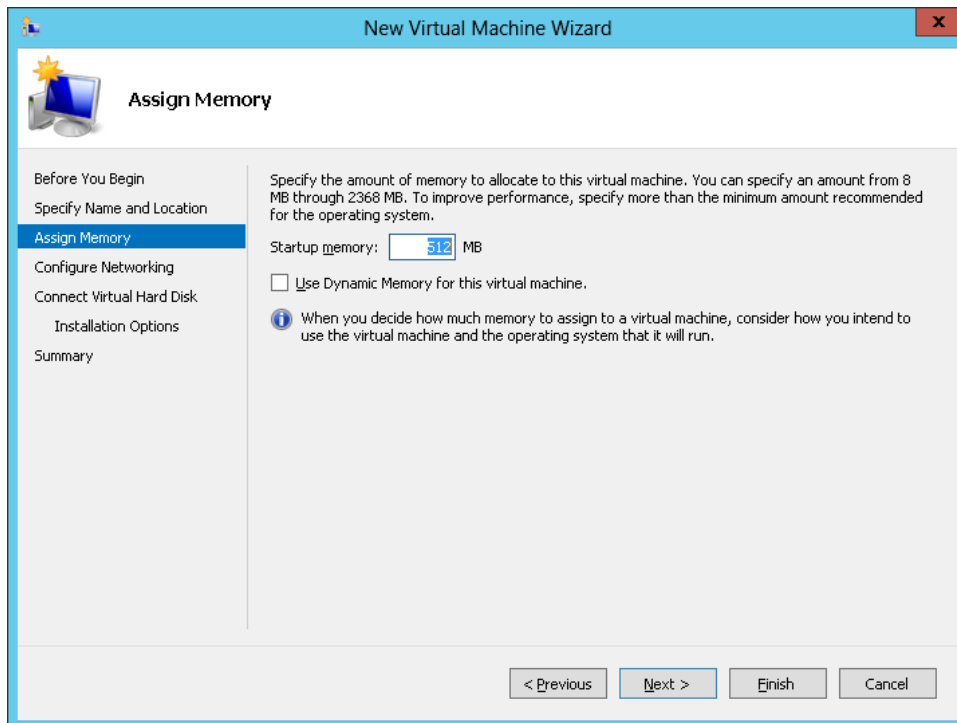
3. Select a target cluster node where a VM will be created, and click **OK**.



- Specify a name and location of the virtual machine.

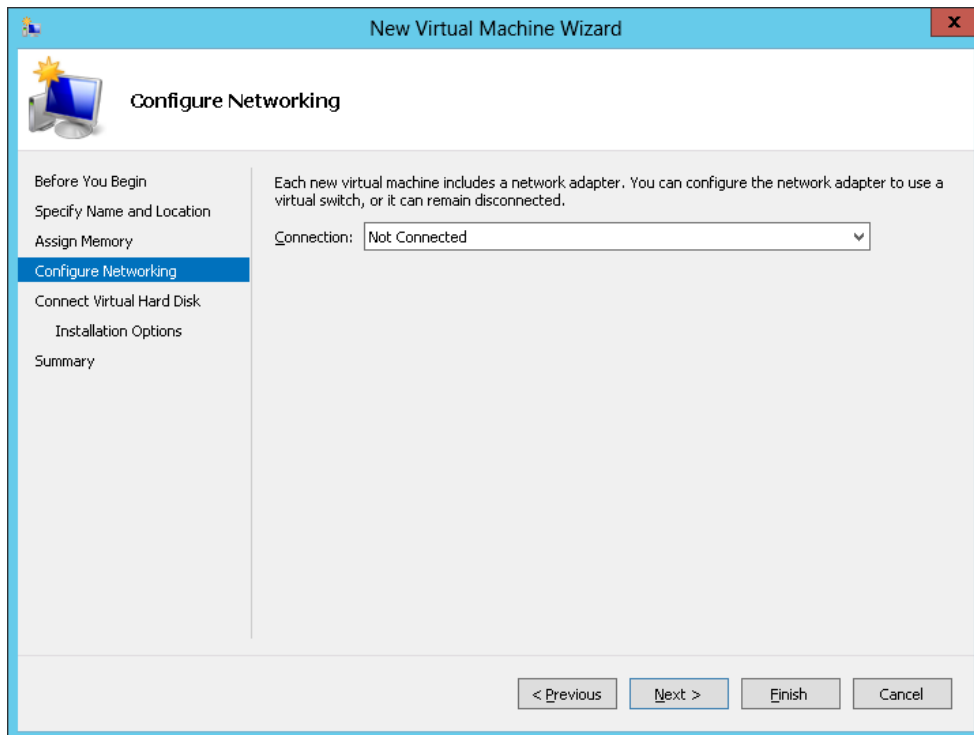


- Click **Next** to continue.
- Define the memory size to be allocated to the virtual machine.



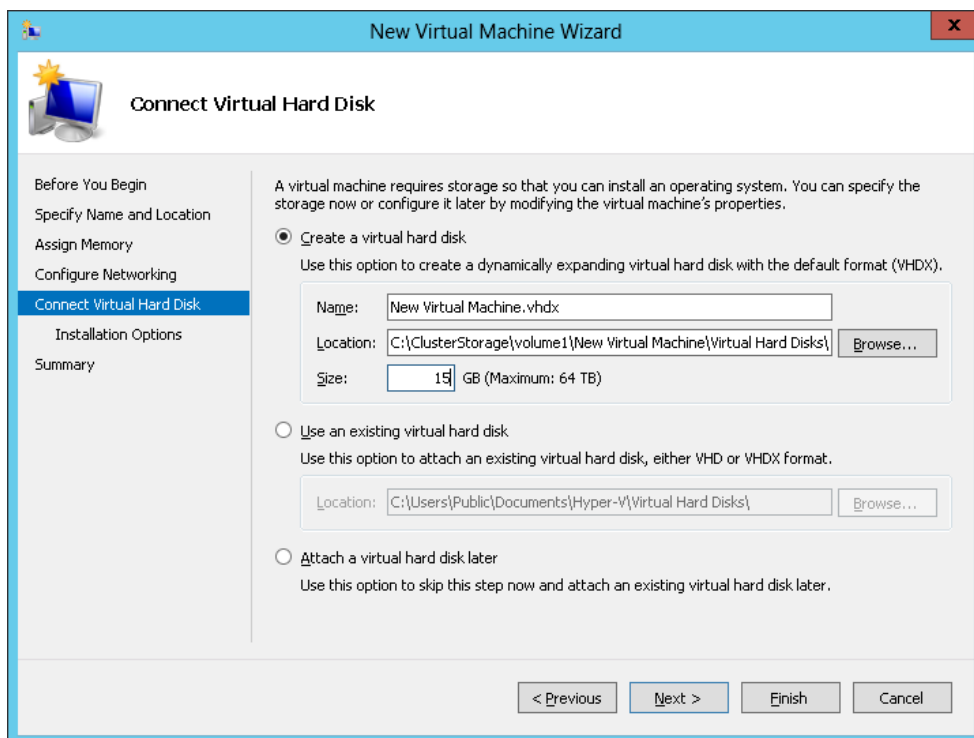
- Click **Next** to continue.

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



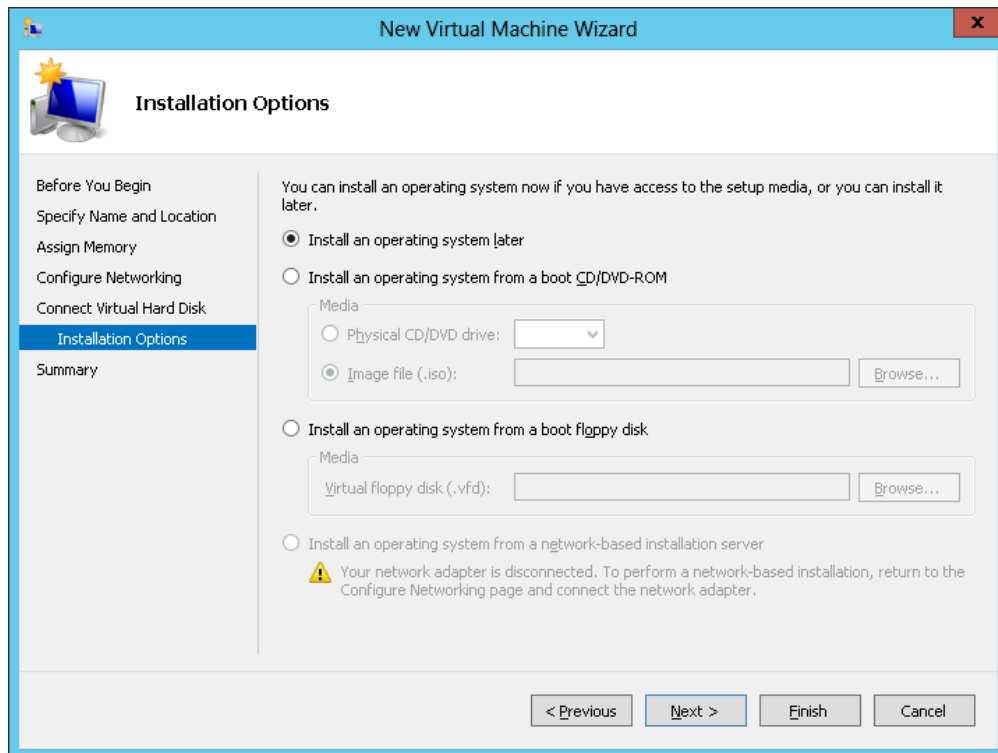
9. Click **Next** to continue.

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



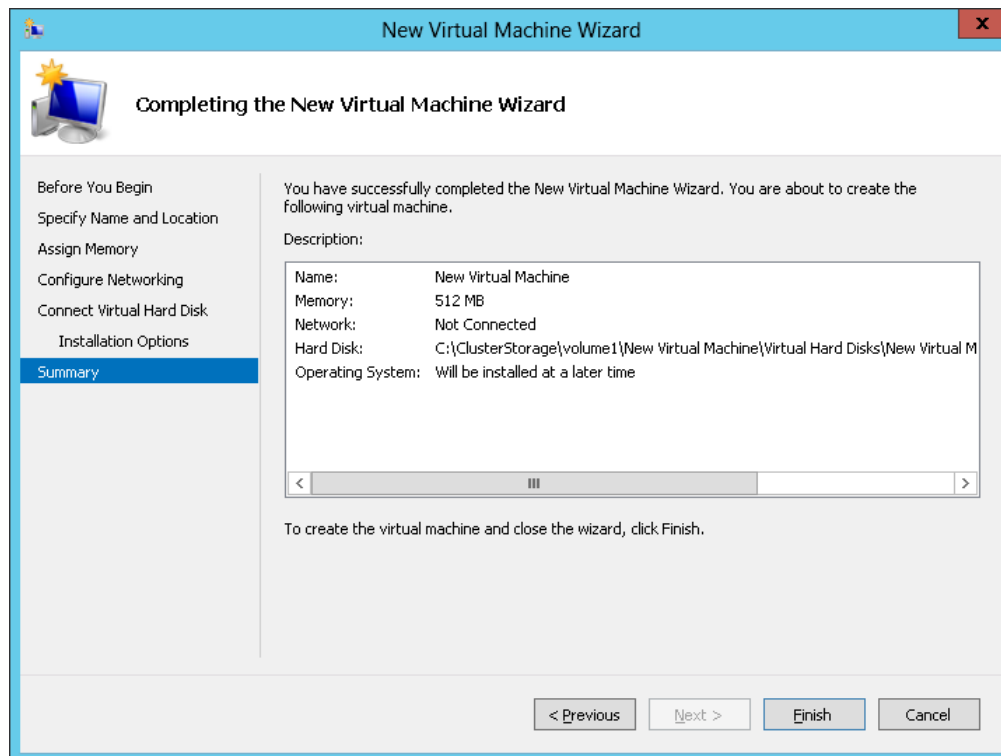
11. Click **Next** to continue.

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



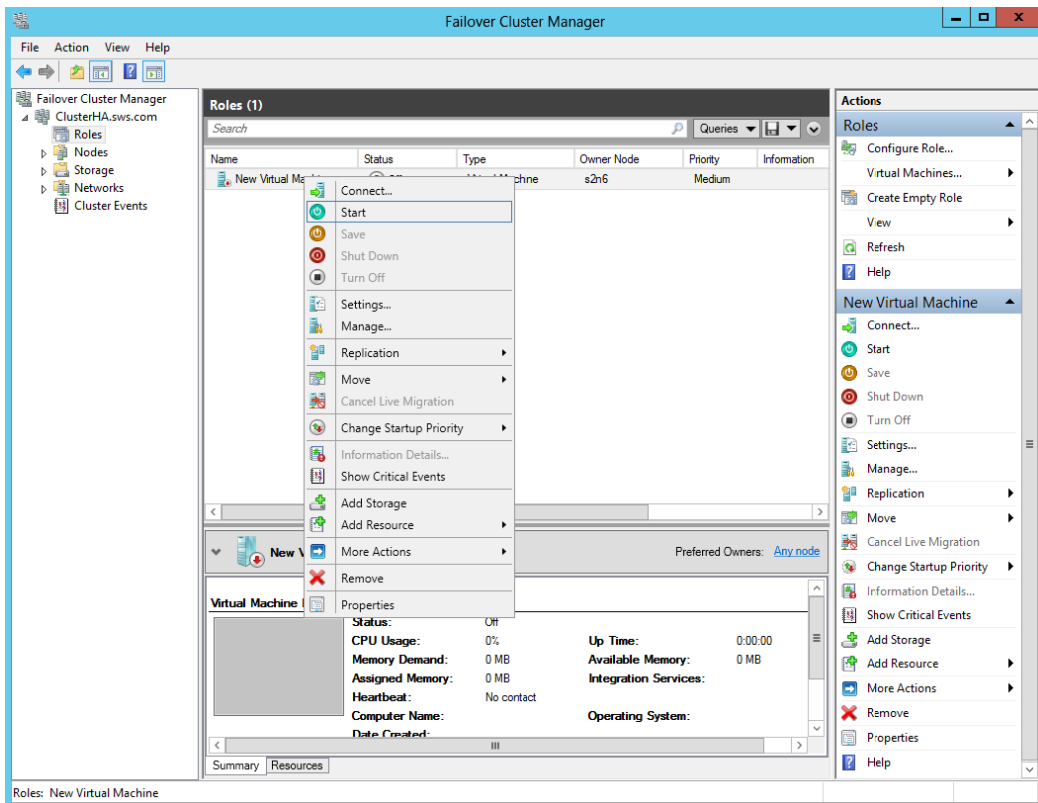
13. Click **Next** to continue.

14. Make sure that all parameters are correct. Click **Previous** to make any changes.

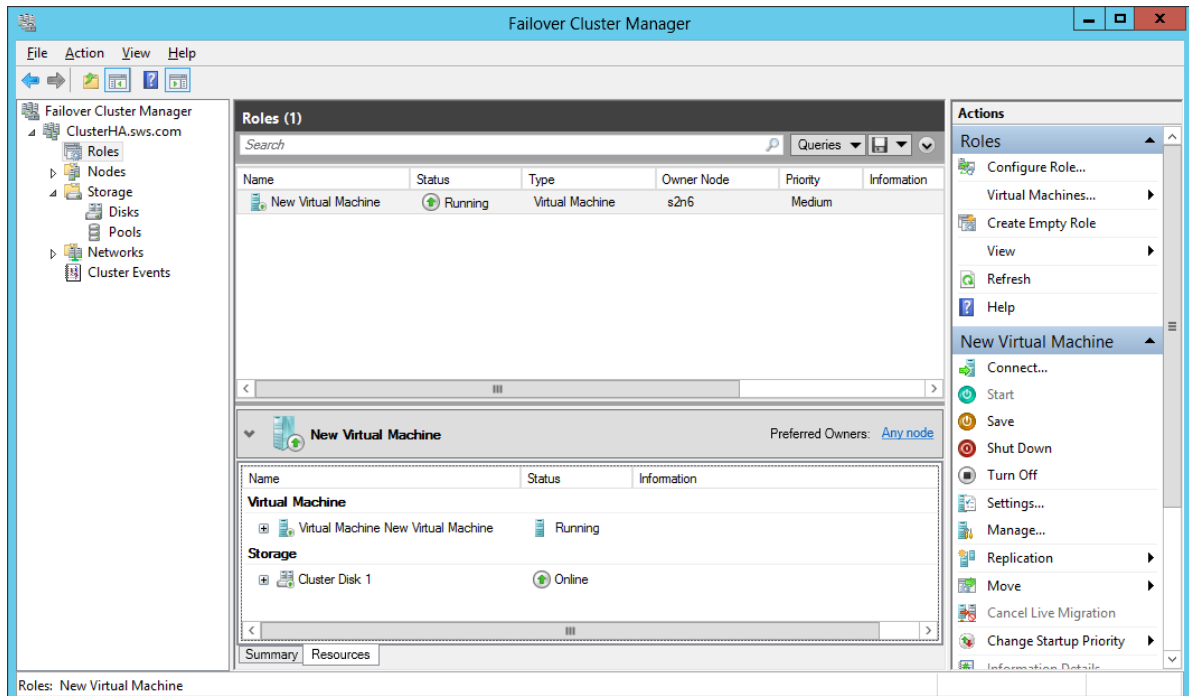


15. Click **Finish**.

16. Right-click the added virtual machine and click **Start**.



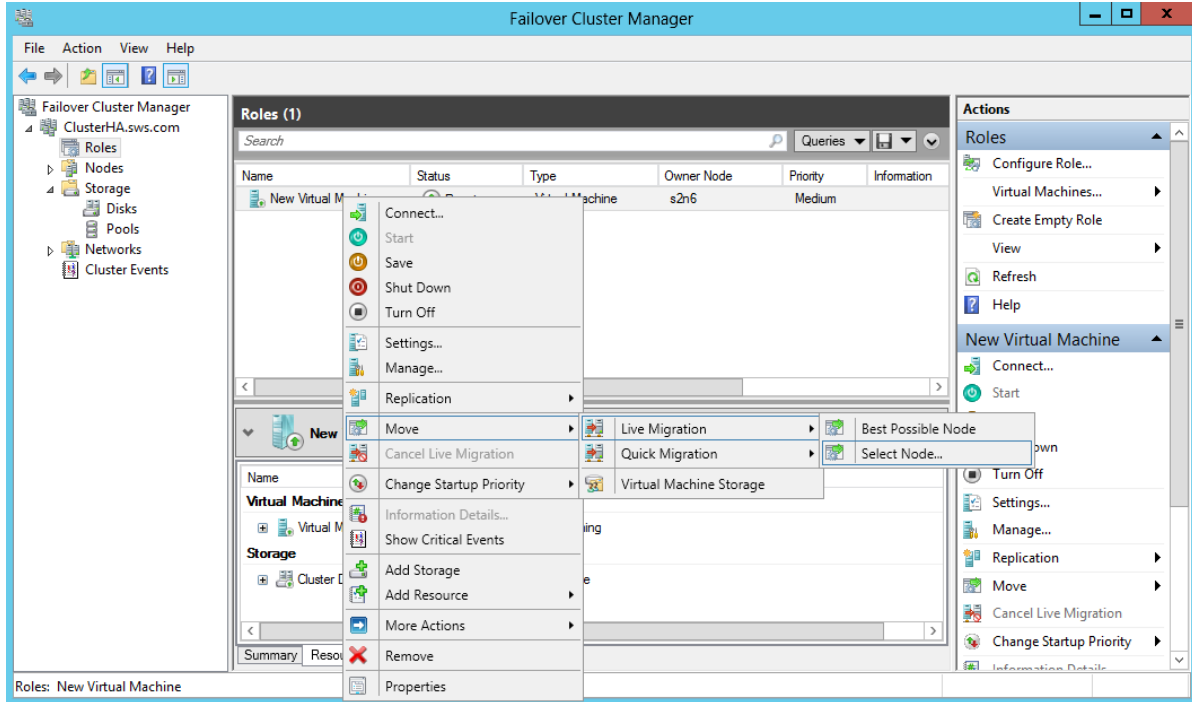
17. Make sure that the virtual machine is running and operating successfully.



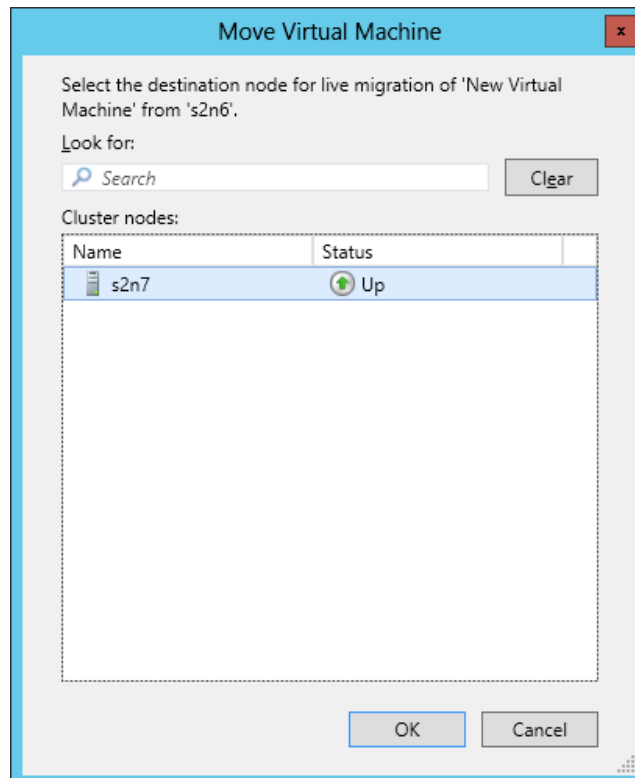
LIVE MIGRATION OF A VIRTUAL MACHINE

To perform live migration of a virtual machine to another node:

1. Launch **Failover Cluster Manager**.
2. Right-click the needed virtual machine and go to **Move -> Live Migration -> Select Node**.

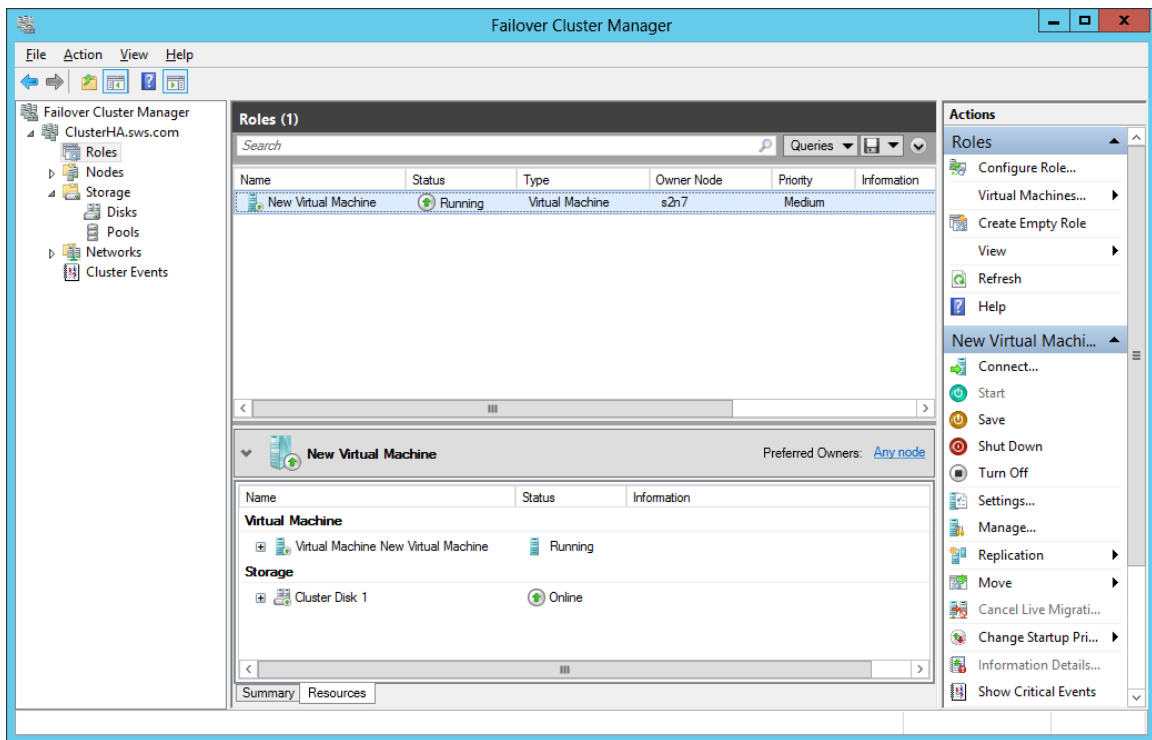


3. Select a node for live migration in the **Move Virtual Machine** dialog.



4. Click **OK** to continue.

Make sure that the live migration was performed successfully. **Failover Cluster Manager** window should look as follows.



CONTACTS

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