



Multipathing I/O (MPIO) enables the use of multiple iSCSI ports on a Drobo SAN to provide fault tolerance. MPIO can also boost performance of an application by load balancing traffic across multiple ports. This guide describes how to easily configure MPIO to Drobo iSCSI storage for a Windows server.



Topics

- What you will need & Prerequisites
- Provisioning Drobo storage volumes
- Disabling Drobo Dashboard on cluster member hosts
- Enabling Windows clustering and Hyper-V
- Configuring the iSCSI initiator
- Activating and formatting Drobo volumes
- Configuring the Microsoft cluster
- Provisioning Hyper-V virtual machines

What You Will Need

- Drobo iSCSI SAN storage B1200i, updated to the current firmware version
- Drobo Dashboard management software, updated to the current software version
- Two Windows 2008 R2 Servers
- An available static IP address for Microsoft cluster services

Prerequisites

This document assumes that the Drobo iSCSI SAN has been deployed and Drobo Dashboard has been installed on all hosts in the cluster and a management server or workstation. If the Drobo has not been configured, follow the directions in the Drobo *Getting Started Guide*.

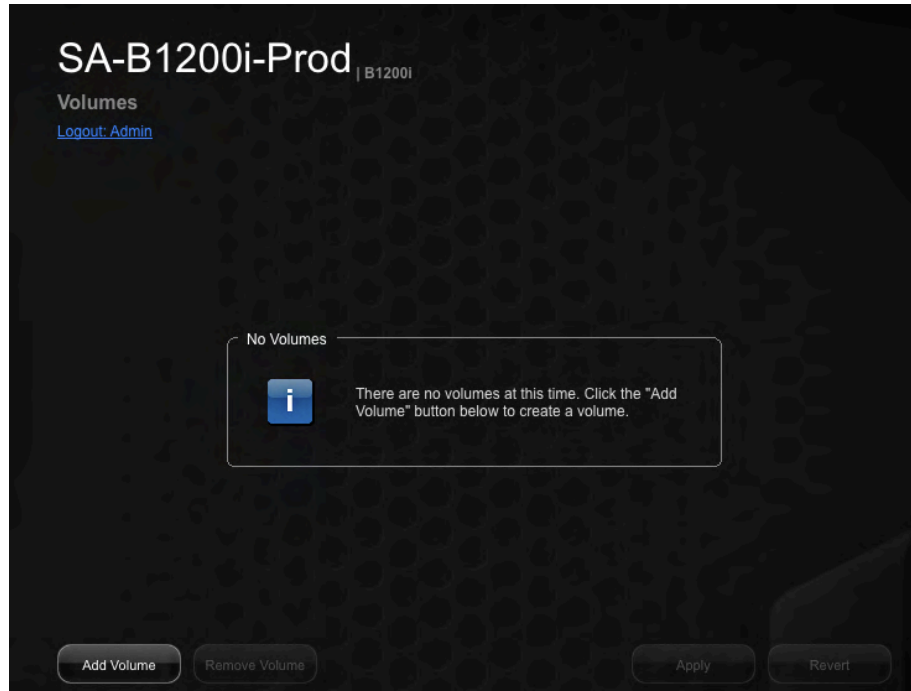
- B1200i - http://www.drobo.com/media/pdf/Drobo_B1200i-getting-started.pdf

You can find the current versions of firmware and Drobo Dashboard software on www.drobo.com > Support > Updates.



Provisioning Drobo Storage

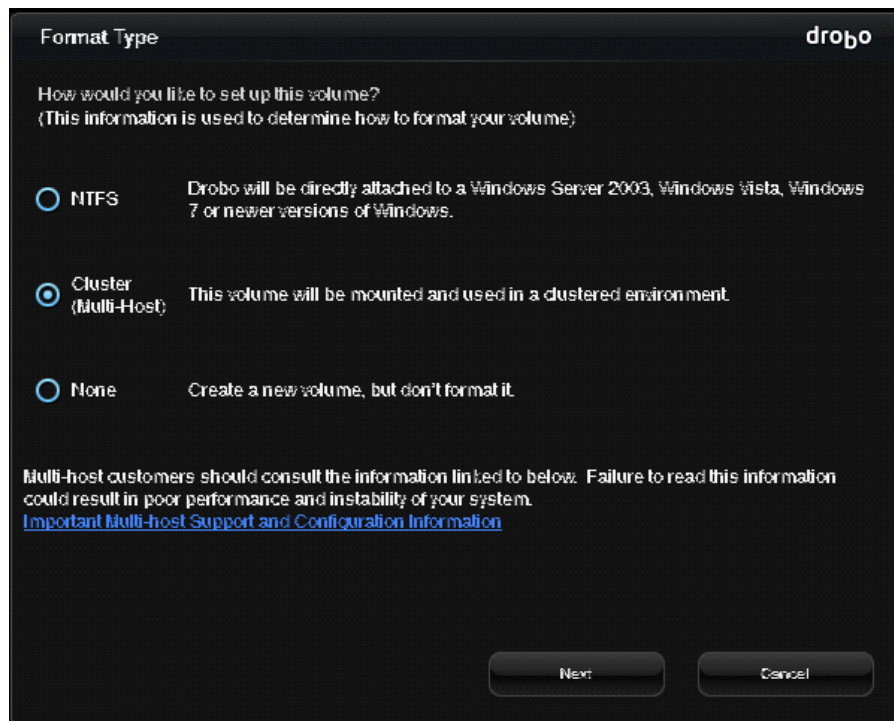
STEP 1



Launch the Drobo Dashboard application and select the Drobo to use to provision storage.

On the Volumes menu, click **Add Volume** to launch the volume creation wizard.

STEP 2



Select **Cluster (Multi-Host)** as the format type and click **Next**.

The multi-host format type permits multiple hosts to connect to the same storage volume.



STEP 3



The first volume will be used as the Quorum (also known as the witness) disk, used by the Windows Clustering Service to store configuration information about the Windows cluster.

Move the slider all the way to the left and verify that the Volume Size is set to the minimum size of **50GB**.

Click **Finish** to complete the wizard.

STEP 4

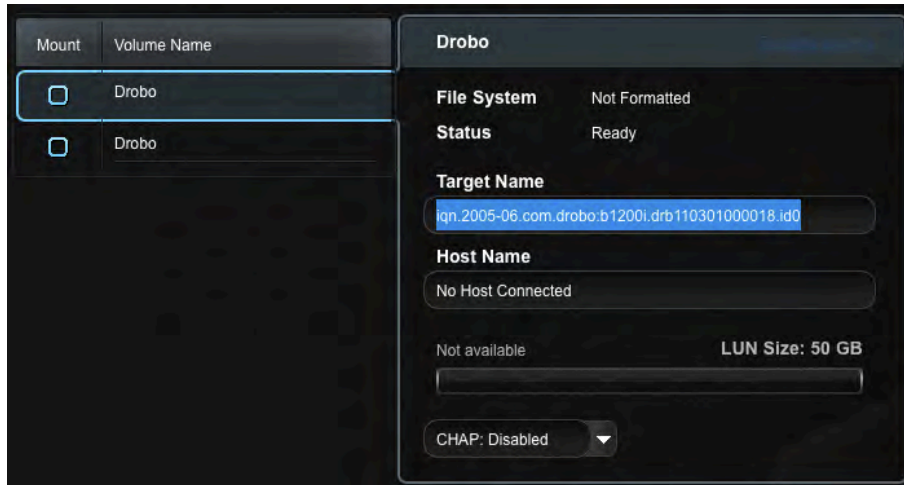


The second volume will be used to store Hyper-V virtual machines hard disks.

Repeat steps 1 - 4 to create a 16TB for virtual machine storage.



STEP 5



Once both volumes have been created, record the **Target Name** for each volume, as they will be needed in subsequent steps.

Windows Clustering is an advanced application and requires manual configuration of the iSCSI settings. The newly created volumes will not be mounted from the Drobo Dashboard.

STEP 6



Click on **Device Settings** > **Network** to view the Drobo's network configuration.

Record the IP address for all iSCSI ports in use on the Drobo, as they will be needed in subsequent steps to configure the iSCSI parameters.



Disabling Drobo Dashboard on Cluster Member Hosts

Drobo Dashboard typically handles all aspects of provisioning and mapping storage on Windows hosts. During installation it also modifies a number of registry settings to optimize iSCSI performance with the Drobo SAN.

In a clustered environment, the Dashboard's fault monitoring can interfere with disk migration between hosts. To provide the best performance while ensuring disk failover performs seamlessly, the Dashboard must be installed and then disabled on all cluster members.

Once the service is disabled, a management server or workstation can be used to monitor and provision storage on the Drobo via the management port.

STEP 1

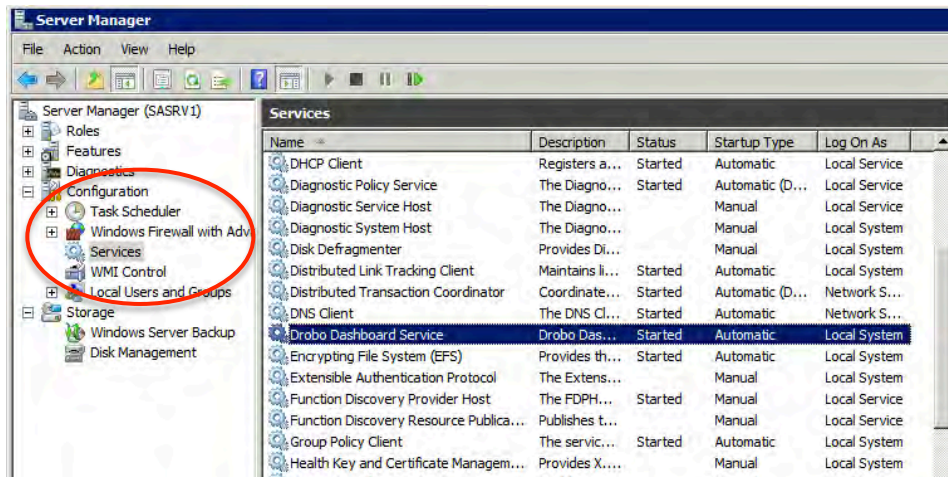


To load the Server Manager, select **Start > All Programs > Administrator Tools > Server Manager**.

Select **Action > Add Features** to launch the **Add Features** wizard.

To launch the Server Manager from the run command, enter `ServerManagerCmd.exe` and press **enter**.

STEP 2



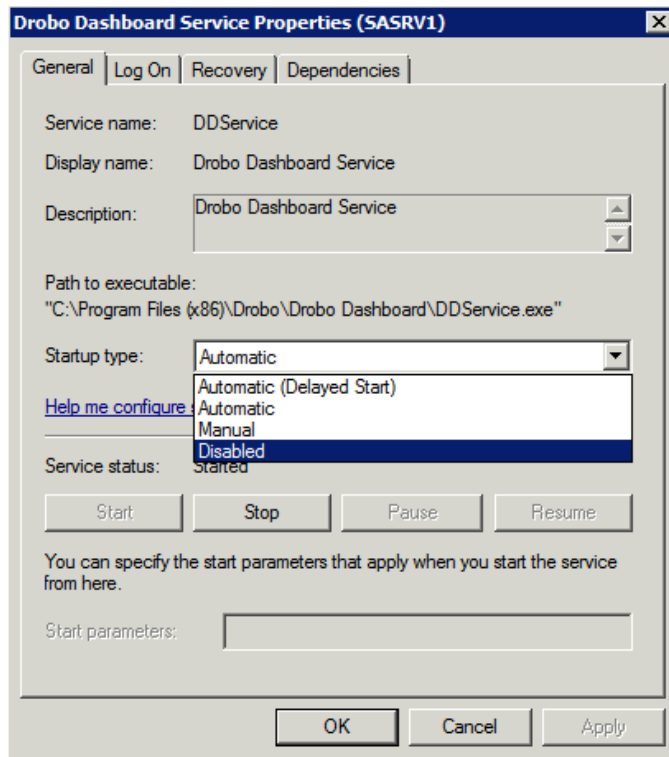
Expand the **Configuration** container and select **Services**.

Scroll down the list of services to find Drobo Dashboard Service.

Double-click **Drobo Dashboard Service** to display the properties screen.



STEP 3



In the General tab, choose **Disabled** from the Startup type drop-down menu.

In the Service status section toward the bottom of the window, click the **Stop** button to terminate the service currently running.

Click **OK** to save the changes.

Drobo Dashboard is now disabled and should not be enabled on the host.

Repeat steps 1 – 3 on all remaining cluster hosts.

Management of the Drobo must now be performed from a management server, workstation, or any non-clustered host.



Enabling Windows Clustering and Hyper-V

Since network topology and interface configuration varies greatly between deployments, configuration of Hyper-V virtual network interfaces is outside the scope of this document. Virtual machine networking will be configured after the cluster has been installed and tested. Virtual networking is not required during the cluster deployment or to perform live virtual machine failover.

After the Hyper-V cluster installation is complete, consult the Microsoft documentation on virtual network interface configuration to enable networking:

- Microsoft Whitepaper - <http://www.microsoft.com/download/en/details.aspx?displaylang=en&id=9843>
- Getting Started Guide - [http://technet.microsoft.com/en-us/library/ee344828\(v=ws.10\).aspx](http://technet.microsoft.com/en-us/library/ee344828(v=ws.10).aspx)

STEP 1



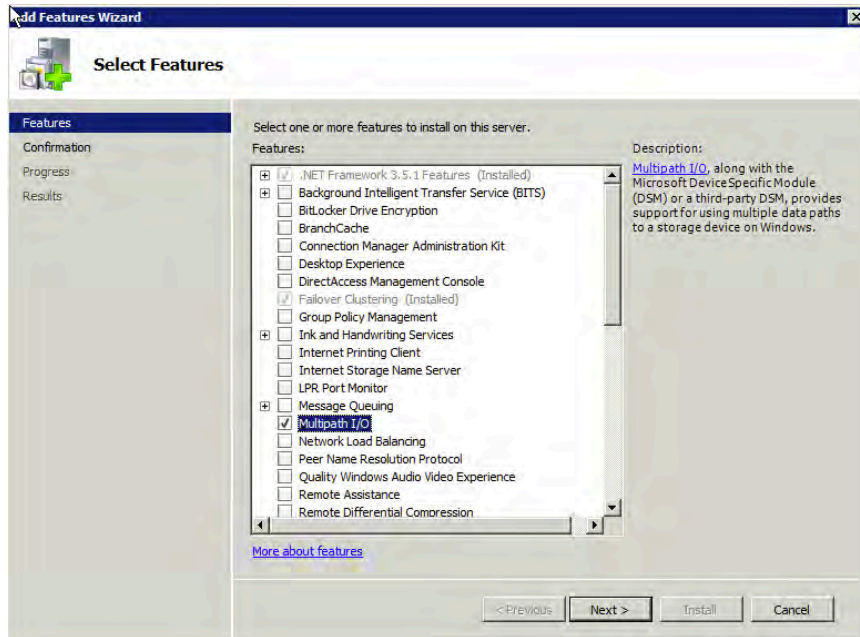
To load the Server Manager, select **Start > All Programs > Administrator Tools > Server Manager**.

To launch the Add Features wizard, select **Action > Add Features**.

To launch the Server Manager from the run command, enter *ServerManagerCmd.exe* and press **enter**.



STEP 2

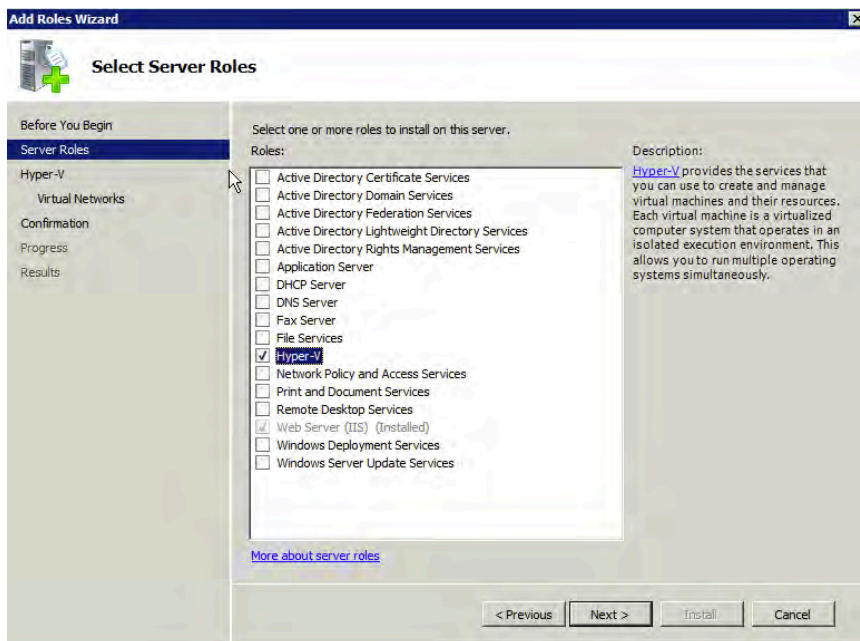


Select **Failover Clustering** and **Multipath I/O** and click **Next**.

On the next screen a summary of features to be installed is displayed. Verify that both **Failover Cluster** and **Multipath I/O** are listed and click **Install**.

A reboot may be required to complete the installation. If prompted to reboot, click **OK**.

STEP 3



If a reboot was required, repeat Step 1 to load the Server Manager.

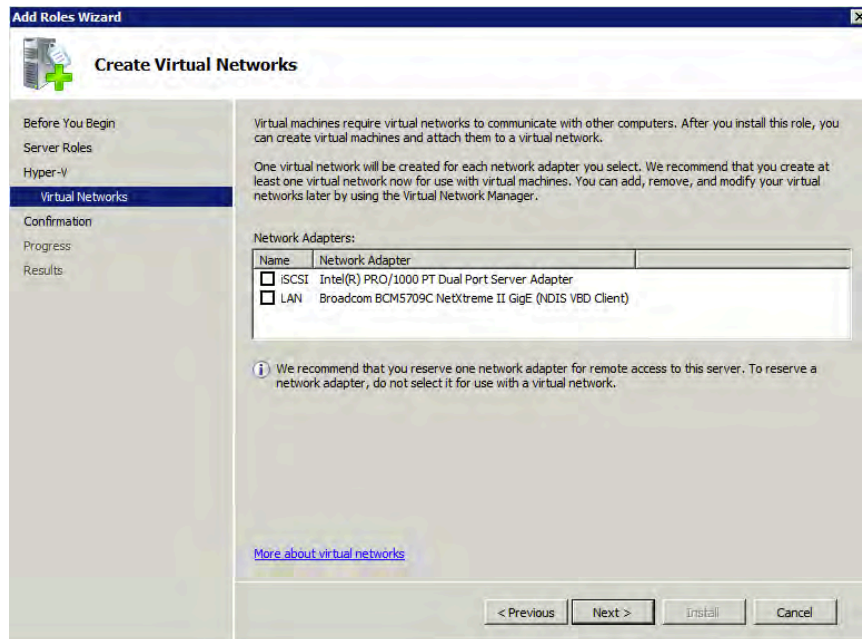
Select **Action > Add Roles** to launch the **Add Roles Wizard**.

Select the **Hyper-V** role and click **Next** to continue.

Click **Next** on the Introduction to Hyper-V screen.



STEP 4



Verify no Network Adapters are selected and click **Next**.

On the summary screen verify that the Hyper-V role is selected and click **Install**.

A reboot may be required to complete the installation. If prompted to reboot, click **OK**.

STEP 5

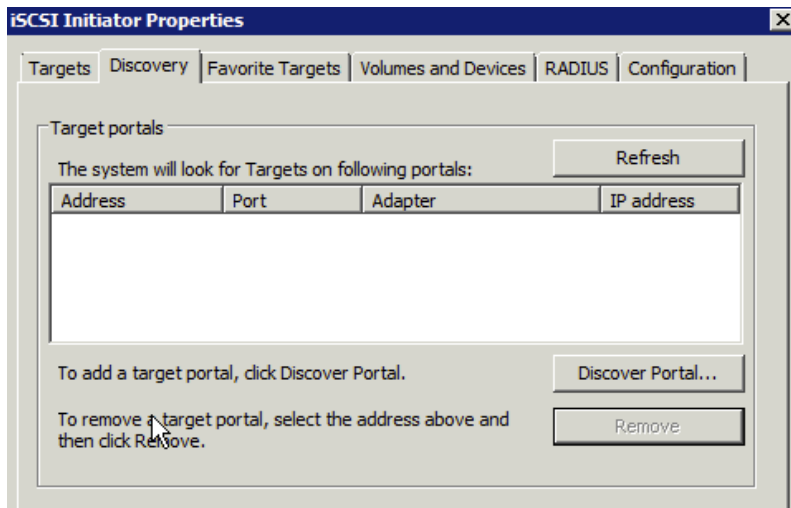
Repeat all the steps in this section on the secondary server to be used in the cluster to enable the required roles and features.



Configuring the iSCSI Initiator

The iSCSI initiator maps Drobo SAN storage to the server and is normally automatically configured by Drobo Dashboard. Windows clustering, however, is an advanced topic and requires steps that are not supported by Drobo Dashboard.

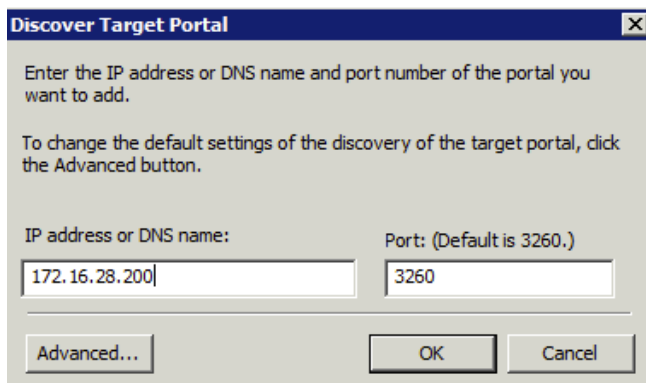
STEP 1



To load the iSCSI initiator, click **Start > Control Panel > iSCSI**.

On the Discovery tab, click **Discover Portal**.

STEP 2

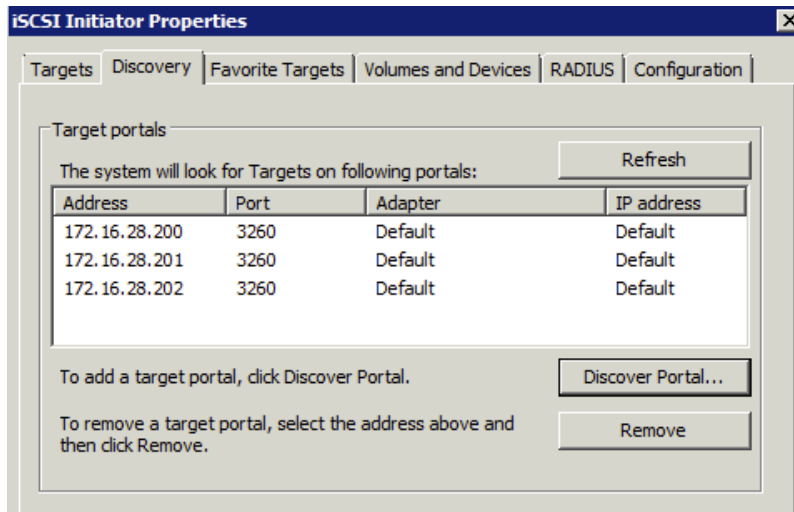


Enter the first Drobo iSCSI IP address in the IP address or DNS name field and verify that the port is set to 3260.

Click **OK** and repeat this step until all Drobo iSCSI IP addresses have been added.



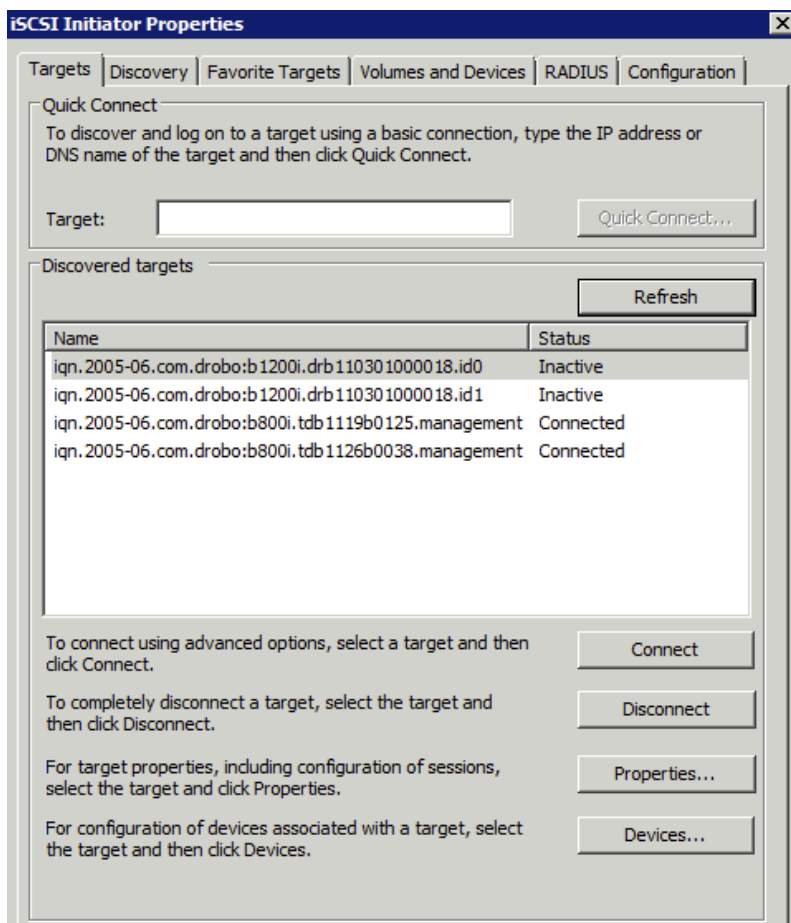
STEP 3



Verify that all Drobo iSCSI IP addresses are listed in the Target portals list.

In this example, a B1200i is used and all three iSCSI ports have been added.

STEP 4



The Targets tab displays all volumes discovered on the Drobo SAN.

Select the volume created for the quorum disk in the Discovered targets list and click **Connect**.

If the target is not listed, click Refresh to rescan for available targets. If the target still does not appear, verify that the discovery portals were entered correctly in steps 1 – 3.



STEP 5

Connect To Target

Target name:
iqn.2005-06.com.drobo:b1200i.drb110301000018.id0

Add this connection to the list of Favorite Targets.
This will make the system automatically attempt to restore the connection every time this computer restarts.

Enable multi-path

Advanced... OK Cancel

In the Connect to Target screen verify, that both boxes are checked and click **Advanced**.

STEP 6

Advanced Settings

General IPsec

Connect using

Local adapter: Default

Initiator IP: Default

Target portal IP: 172.16.28.200 / 3260

CRC / Checksum

Data digest Header digest

Enable CHAP log on

CHAP Log on information

CHAP helps ensure connection security by providing authentication between a target and an initiator.

To use, specify the same name and CHAP secret that was configured on the target for this initiator. The name will default to the Initiator Name of the system unless another name is specified.

Name: iqn.1991-05.com.microsoft:sasrv1.drobosa.local

Target secret:

Perform mutual authentication
To use mutual CHAP, either specify an initiator secret on the Configuration page or use RADIUS.

Use RADIUS to generate user authentication credentials

Use RADIUS to authenticate target credentials

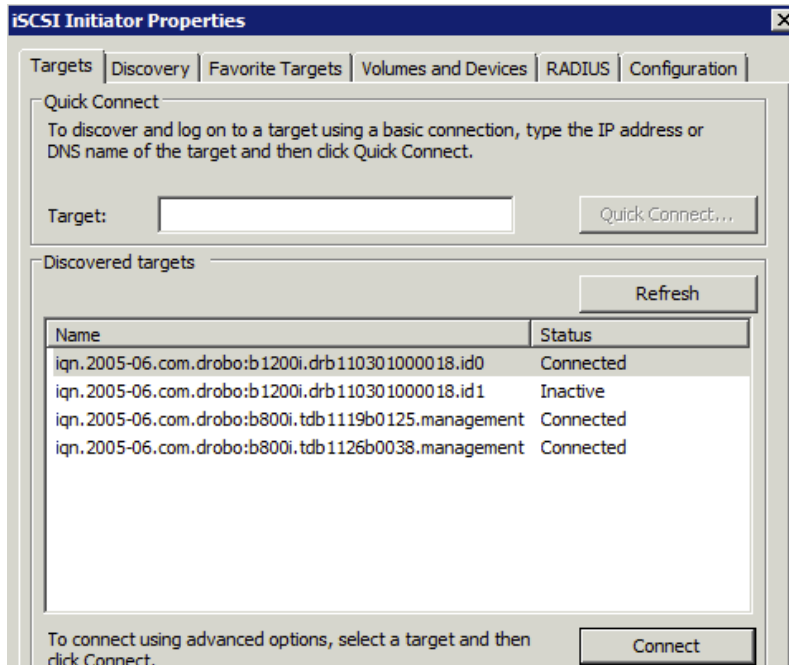
OK Cancel Apply

On the General tab, select the first Drobo iSCSI IP. Click **OK** to exit the **Advanced Settings**.

Click **OK** on the **Connect to Target** menu and **OK** again on the iSCSI Initiator Properties to add connection to the Drobo.



STEP 7

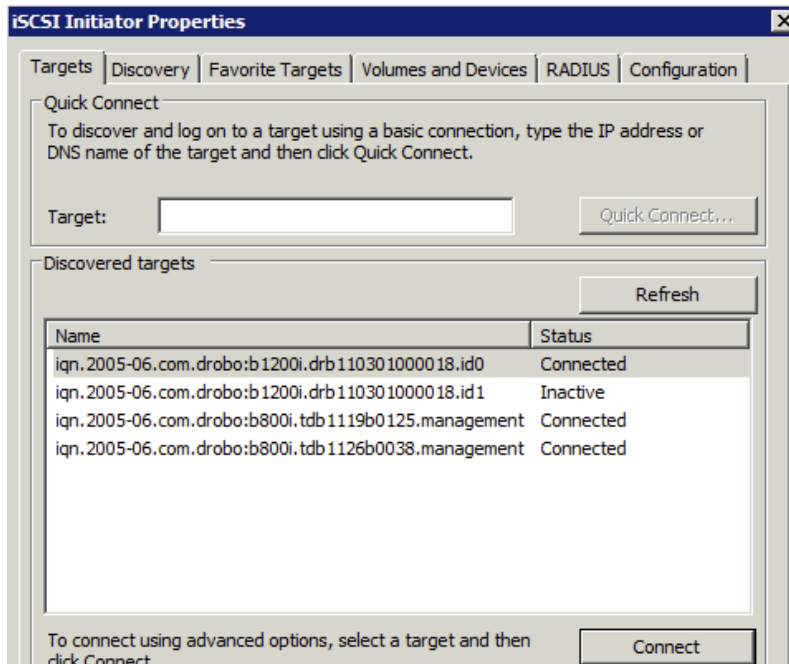


The target status now shows that the quorum target is **Connected**.

To enable path redundancy and load balancing, the remaining Drobo iSCSI IP addresses must be logged into this target.

Repeat steps 4 – 6 for the remaining Drobo iSCSI IP addresses.

STEP 8



Select the volume created for the Hyper-V cluster disk in the Discovered targets list and click **Connect**.

Repeat steps 5 – 8 to map all Drobo iSCSI IP addresses to the Hyper-V volume.

Once all addresses have been connected, click **OK**.

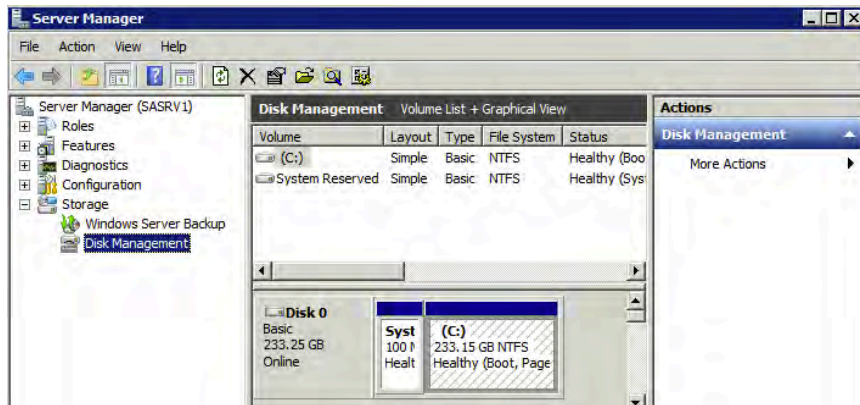
STEP 9

Repeat all the steps in this section *on the secondary server* in the cluster to establish redundant connectivity to the cluster volumes on the Drobo SAN.



Activating and Formatting Drobo Volumes

STEP 1

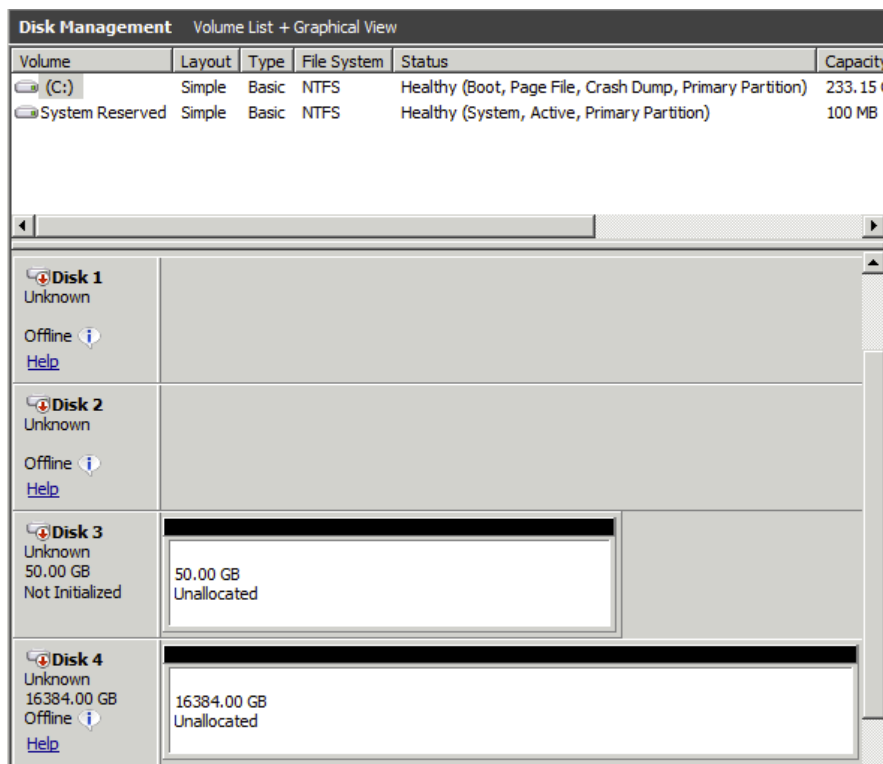


To load the Server Manager, select **Start > All Programs > Administrator Tools > Server Manager**.

Expand **Storage** in the left navigation and then select **Disk Management**.

Click **Cancel** to abort any disk initialization popups that are displayed.

STEP 2



Under Disk Management, scroll through the available disks to find the quorum and Hyper-V cluster disks.

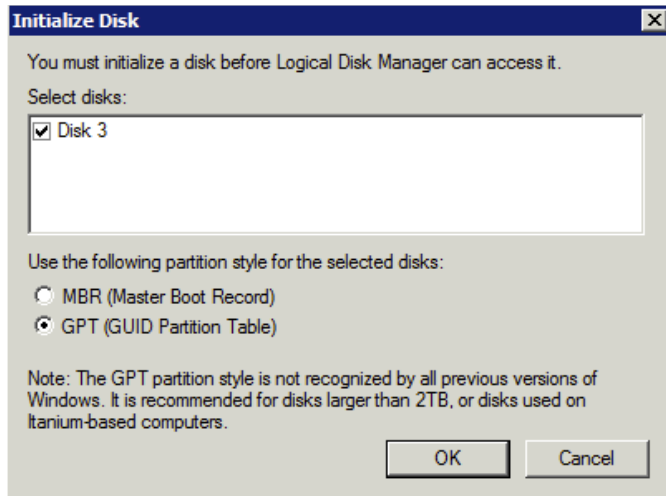


STEP 3



Right-click the quorum disk, and choose **Initialize Disk** from the menu.

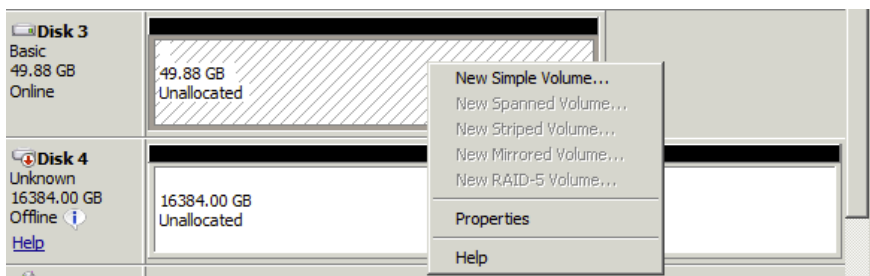
STEP 4



Verify that the disk is selected and change the partition style to **GPT (GUID Partition Table)**.

Click **OK** to initialize the disk.

STEP 5



Right-click in the Unallocated partition box and choose **New Simple Volume** from the menu.



STEP 6

New Simple Volume Wizard [X]

Specify Volume Size
Choose a volume size that is between the maximum and minimum sizes.

Maximum disk space in MB: 51070
Minimum disk space in MB: 8
Simple volume size in MB:

< Back Next > Cancel

In the Specify Volume Size screen, verify that the volume size is equal to the maximum disk space and click **Next**.

STEP 7

New Simple Volume Wizard [X]

Assign Drive Letter or Path
For easier access, you can assign a drive letter or drive path to your partition.

Assign the following drive letter:

Mount in the following empty NTFS folder:

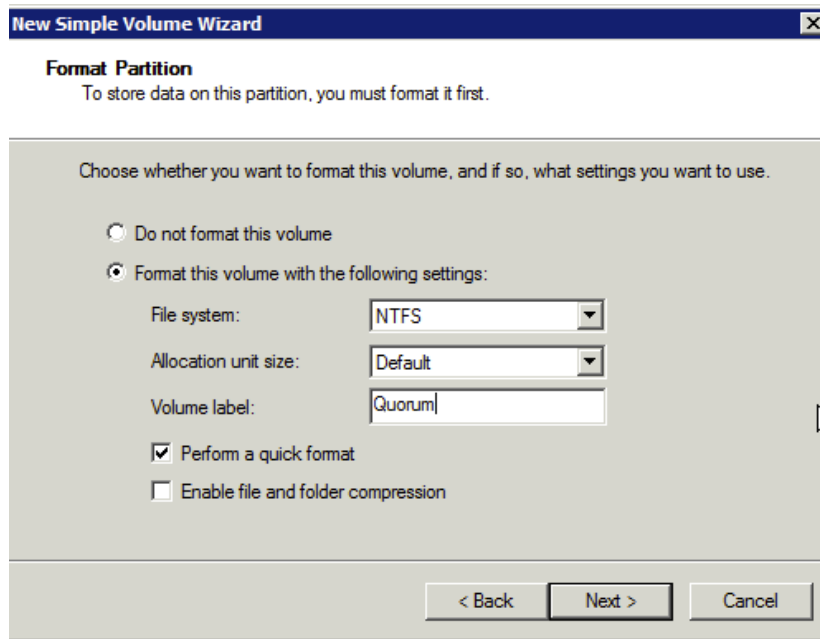
Do not assign a drive letter or drive path

< Back Next > Cancel

In the Assign Drive Letter or Path screen, select **Do not assign a drive letter or path** and click **Next**.



STEP 8



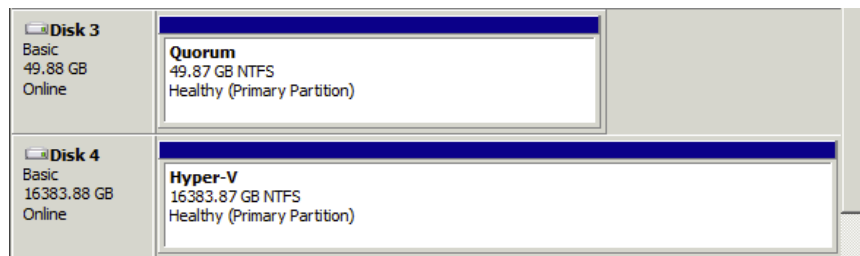
In the Format Partition screen, enter a volume name in the Volume label box and verify that **Perform a quick format** is selected.

Click **Next** and then **Finish** on the summary page.

STEP 9

Repeat steps 1 – 8 to initialize and format the Hyper-V cluster disk.

STEP 10



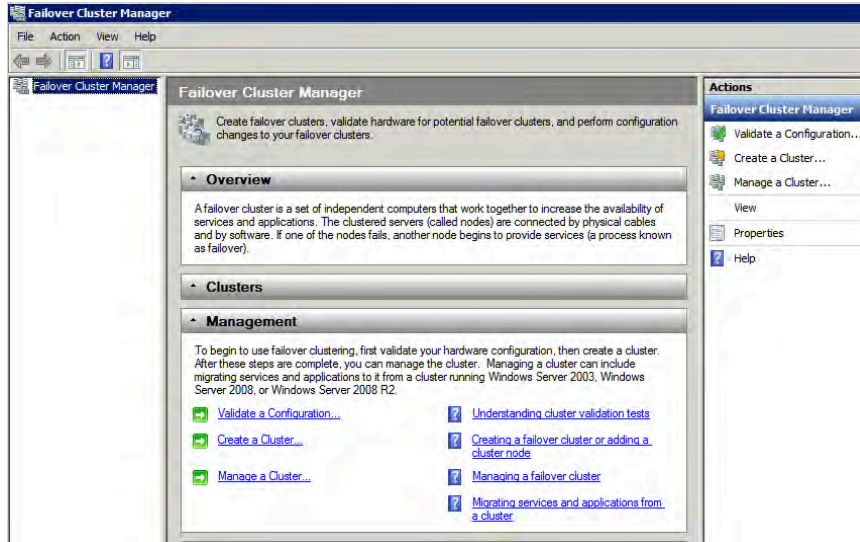
Verify that both cluster volumes display healthy NTFS partitions with no drive letters assigned.

NOTE: No additional operations are required on the second server.



Configuring the Microsoft Cluster

STEP 1

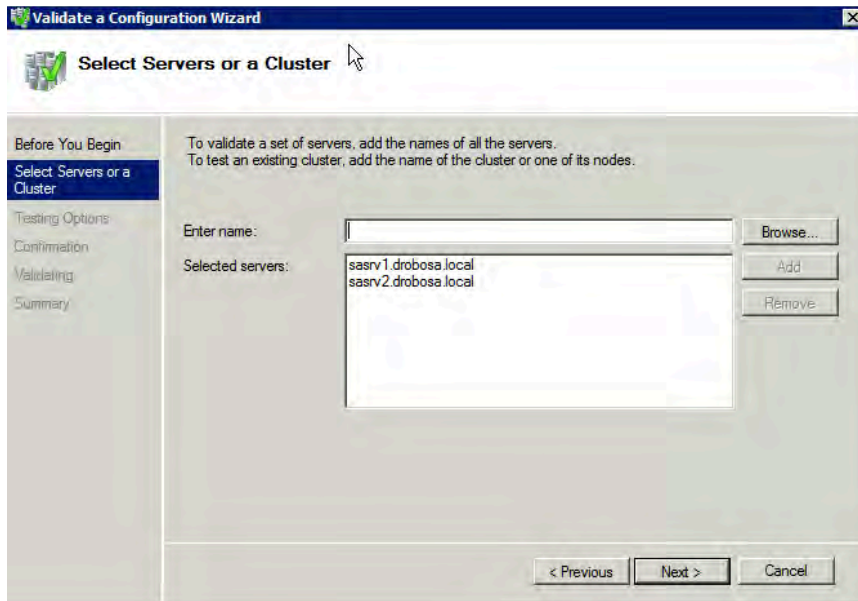


To load the Failover Cluster Manager, select **Start > All Programs > Administrative Tools > Failover Cluster Manager**.

Before cluster services can be configured, the cluster must first be validated.

Click **Validate a Cluster** to begin the wizard.

STEP 2



Click **Next** to display the server selection screen.

Enter the name of each server and click **Add** (to the right of the text field).

Once both servers have been added, click **Next** at the bottom right.

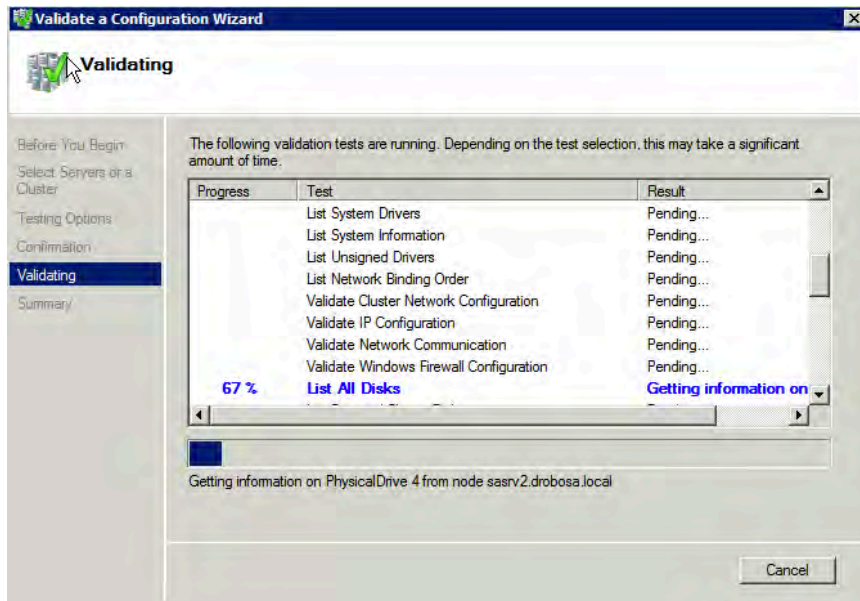
On the next screen select **All Tests** and click **Next**.

STEP 3

In the Testing Options screen, select **All Tests** and click **Next**.



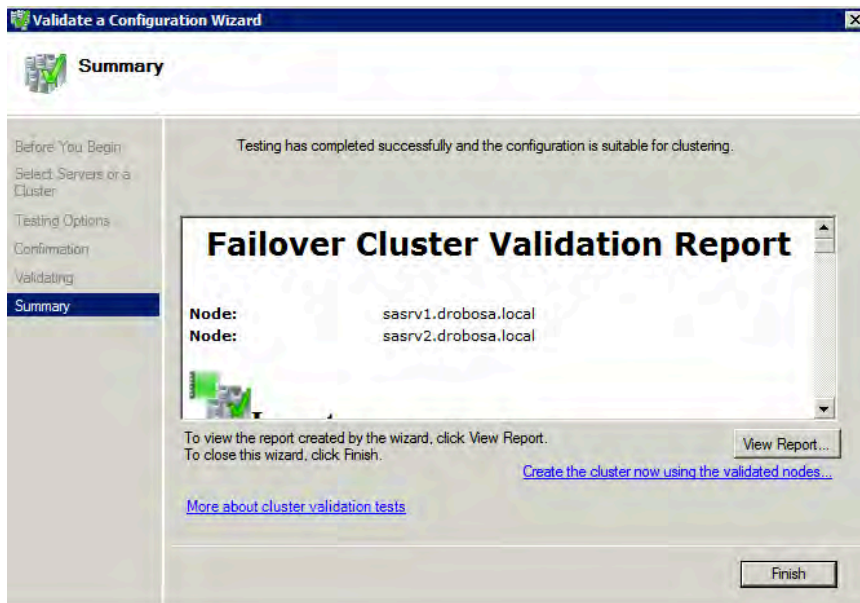
STEP 4



The Validate a Configuration Wizard now begins and can take more than 10 minutes to complete. During this process, disk initialization or format windows may appear.

Click **Cancel** in any windows that appear.

STEP 5



The cluster has been validated and is ready to be provisioned. Click **Finish** to exit the wizard.

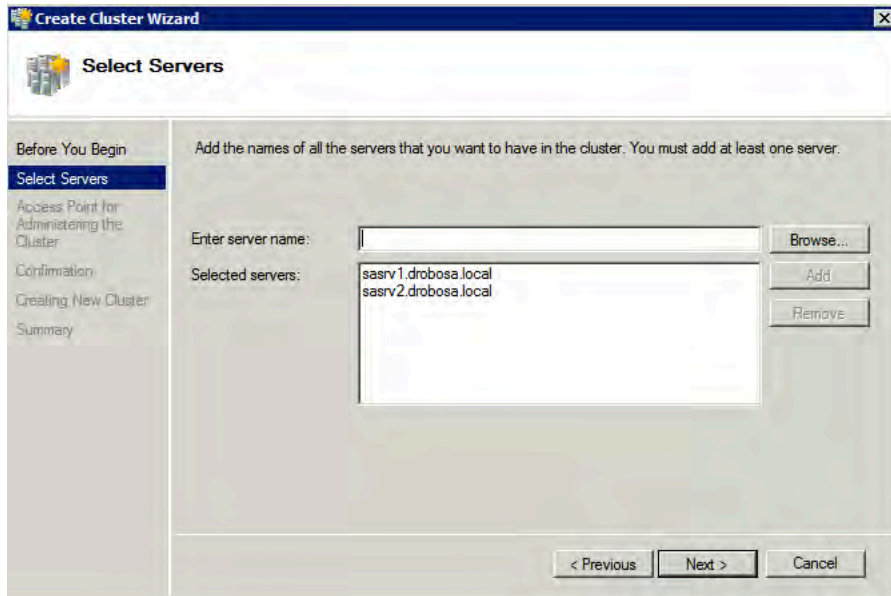
If any tests fail or show a warning state click **View Report** to obtain details on the subsystem(s) that failed.

Drobo Dashboard and SAN firmware must be updated to the latest firmware. If the warnings or failures are iSCSI related, begin by verifying the Drobo SAN has been updated.

For assistance in diagnosing validation failures, consult this Microsoft technet article:
[http://technet.microsoft.com/en-us/library/cc772055\(v=ws.10\).aspx](http://technet.microsoft.com/en-us/library/cc772055(v=ws.10).aspx)



STEP 6



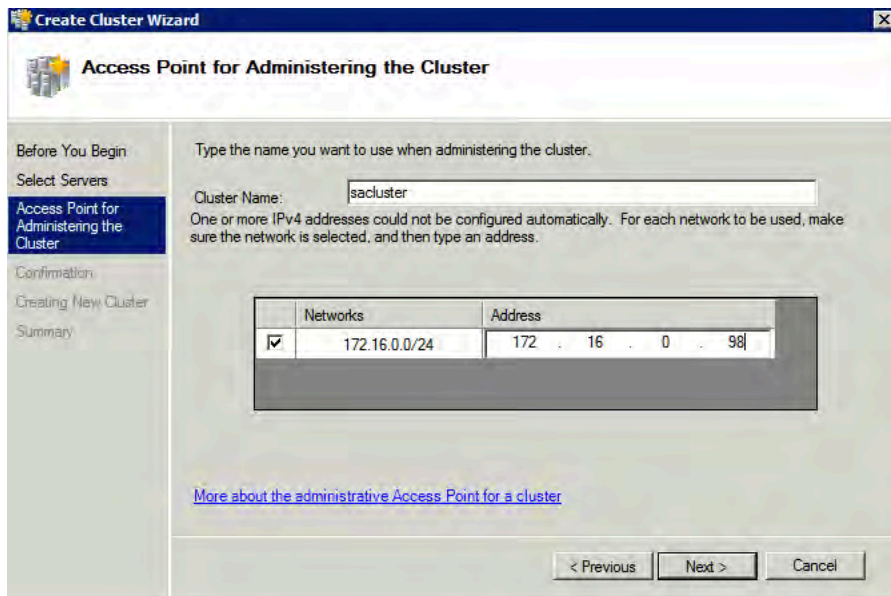
Click **Create Cluster** to launch the Create Cluster wizard.

Click **Select Servers** in the left navigation, enter the host name of each server, and click **Add**.

Once both servers have been added, click **Next**.

The cluster name is a DNS name used to reference the cluster. This host name will point to the active node in the cluster.

STEP 7



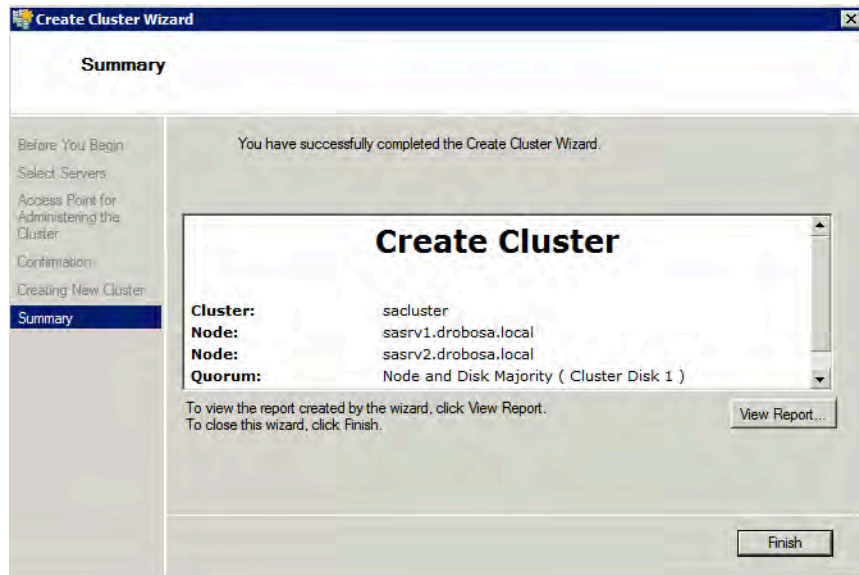
Enter a cluster name and an available static IP address.

Click **Next** to continue.

Verify that the configuration settings are correct on the summary page and click **Next** to create the cluster.



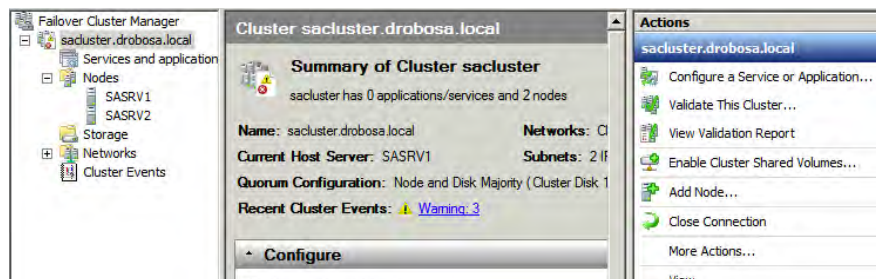
STEP 8



Verify that the cluster was created successfully. If there are any errors, click **View Report** for additional information.

Click **Finish** to close the wizard.

STEP 9

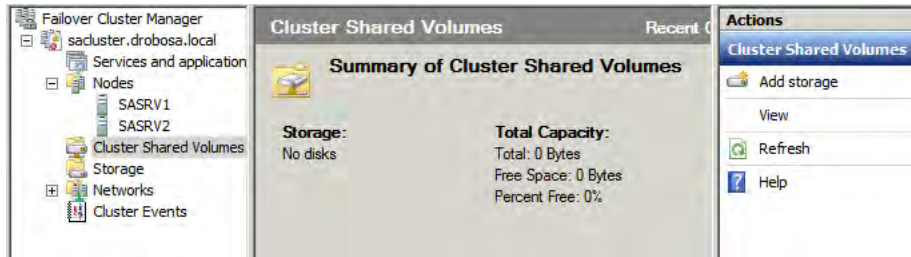


Click the cluster name in the left navigation under Failover Cluster Manager to expand the menu.

In the Actions pane on the right, select **Enable Cluster Shared Volumes** and click **OK** to accept the notice and enable the feature.



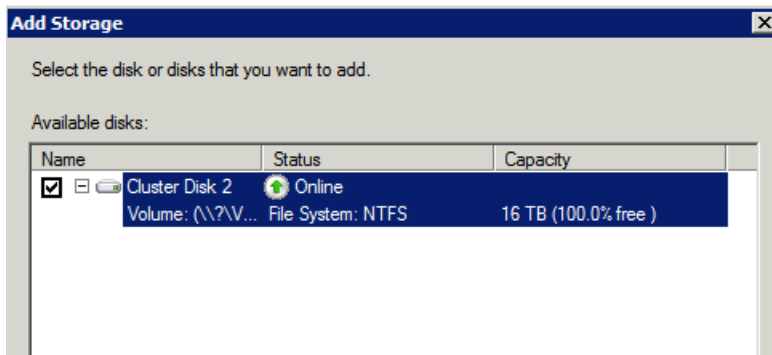
STEP 10



Select the Hyper-V cluster disk and click **OK**.

The cluster is now provisioned and is ready to deploy virtual machines.

STEP 11



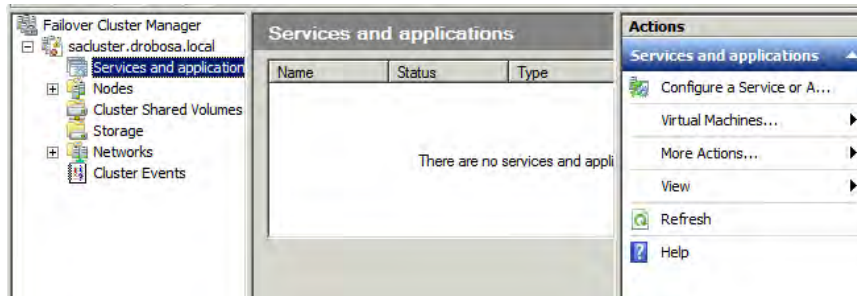
Select the Hyper-V cluster disk and click **OK**.

The cluster is now provisioned and is ready to deploy virtual machines.



Provisioning Hyper-V Virtual Machines

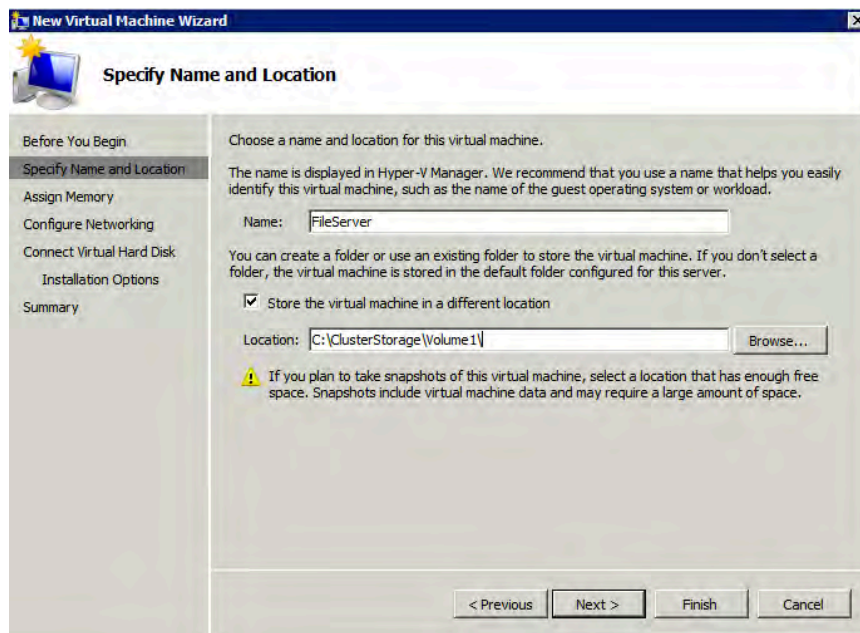
STEP 1



Click **Services and applications** in the left navigation.

In the Actions pan on the right, select **Virtual Machines > New Virtual Machine** and select the server to be used to deploy the VM.

STEP 2



Enter a name for the virtual machine and select **Store the virtual machine in a different location**.

Clustered shared volumes are mapped to individual volumes under a cluster directory on the C drive.

Click **Browse** and navigate to C:\ClusterStorage\Volume1 to store this virtual machine Hyper-V cluster volume.

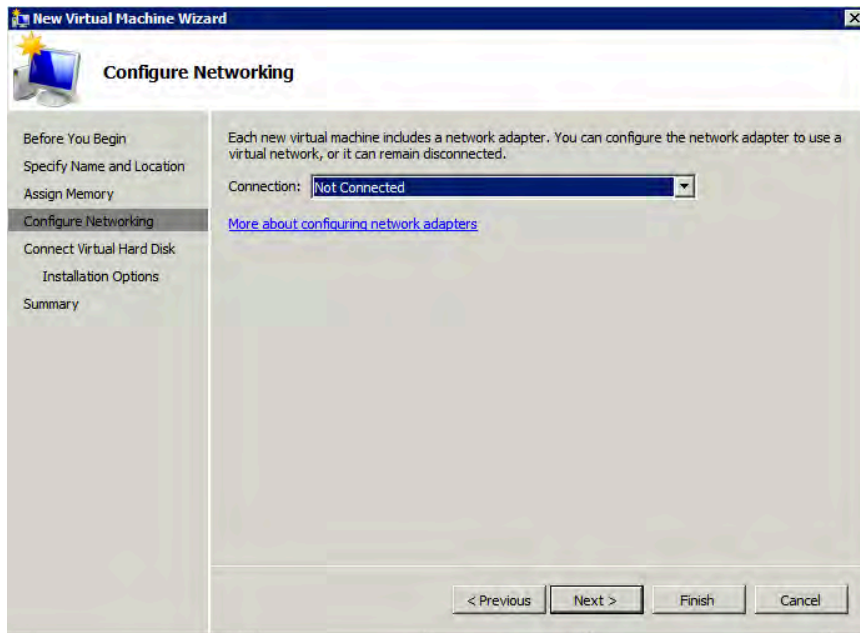
For more information on Cluster Shared Volumes, consult this Microsoft technet article: [http://technet.microsoft.com/en-us/library/dd630633\(v=ws.10\).aspx](http://technet.microsoft.com/en-us/library/dd630633(v=ws.10).aspx)

STEP 3

Click **Assign Memory** in the left navigation, enter the amount of RAM to allocate to this virtual machine, and click **Next**.



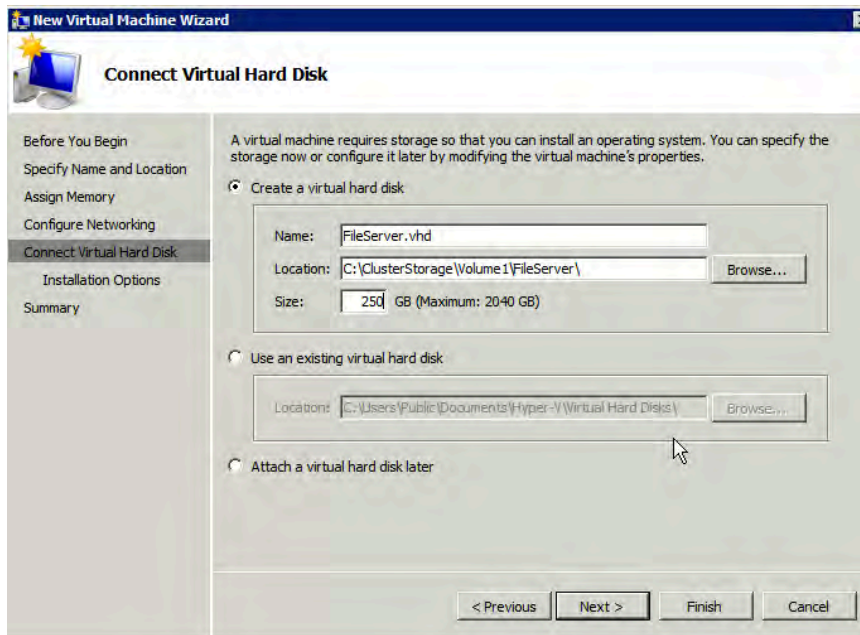
STEP 4



Click **Configure Networking** in the left navigation and select **Not Connected** from the Connection drop-down menu.

(As mentioned earlier, virtual network configuration is outside the scope of this document.)

STEP 5



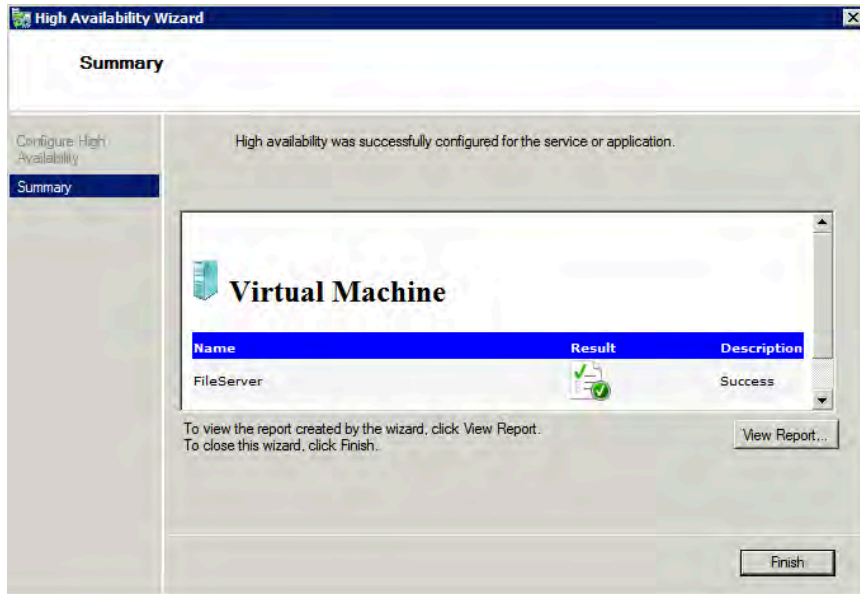
Click **Connect Virtual Hard Disk** in the left navigation, verify that the virtual hard disk will be created under the clustered storage volume, and click **Next**.

STEP 6

Click **Installer Options** in the left navigation, select the Operating System installation media, and click **Finish**.



STEP 7



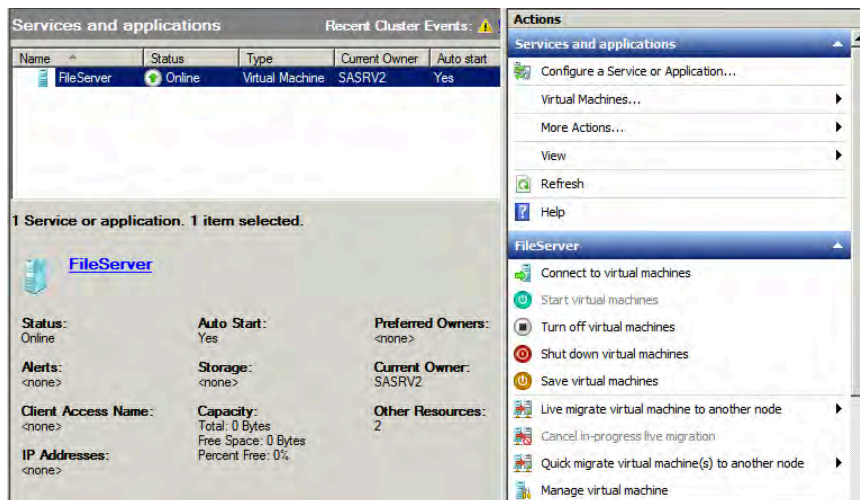
The virtual machine has been provisioned and is now ready for deployment.

Power on the virtual machine and begin the OS installation process.

Note – If any errors are displayed on the summary page, click **View Report** for detailed information on the failure

NOTE: Any warning or error reported will typically result in errors during migrations. Address warnings or errors and resolve them to ensure proper operation.

STEP 8



Once the operating system has been installed, perform a live migration test.

Select **Live Migrate Virtual machine to another node** and then select the second server.

The live migration should complete within 30 seconds and the Current Owner will now display the second server in the cluster.

For more information on live migrations and additional information on virtual network requirements reference, consult this Microsoft technet article: [http://technet.microsoft.com/en-us/library/dd446679\(v=ws.10\).aspx](http://technet.microsoft.com/en-us/library/dd446679(v=ws.10).aspx)