

StarWind iSCSI Target for Microsoft Windows: Using StarWind to Provide Cluster Shared Disk Resource

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INTRODUCTION

Software clustering technology enables you to make several servers to work as a unit. Various cluster configurations can be implemented. One of the most frequently used configurations is the fail-over cluster. This configuration assumes that if one of the cluster nodes fails, the reserved node automatically brings online, serving the applications. With that the workflow remains uninterrupted and secured.

Fail-over cluster configuration includes two (o more) server nodes that share an external storage. Based on the iSCSI technology, **Rocket Division StarWind** enables to create an external storage in Windows environment without implementation of expensive FC or external SCSI solutions. With **Rocket Division StarWind** you can create a shared disk array on a host running Microsoft Windows.

This document gives you detailed step-by-step instructions on StarWind configuring for fail-over clusters.

For more information on Microsoft's clustering technology press refer to <http://www.microsoft.com/windowsserver2003/technologies/clustering/default.aspx>.

MANUAL

The diagram below illustrates typical StarWind-based iSCSI storage network architecture with Microsoft Cluster Service.

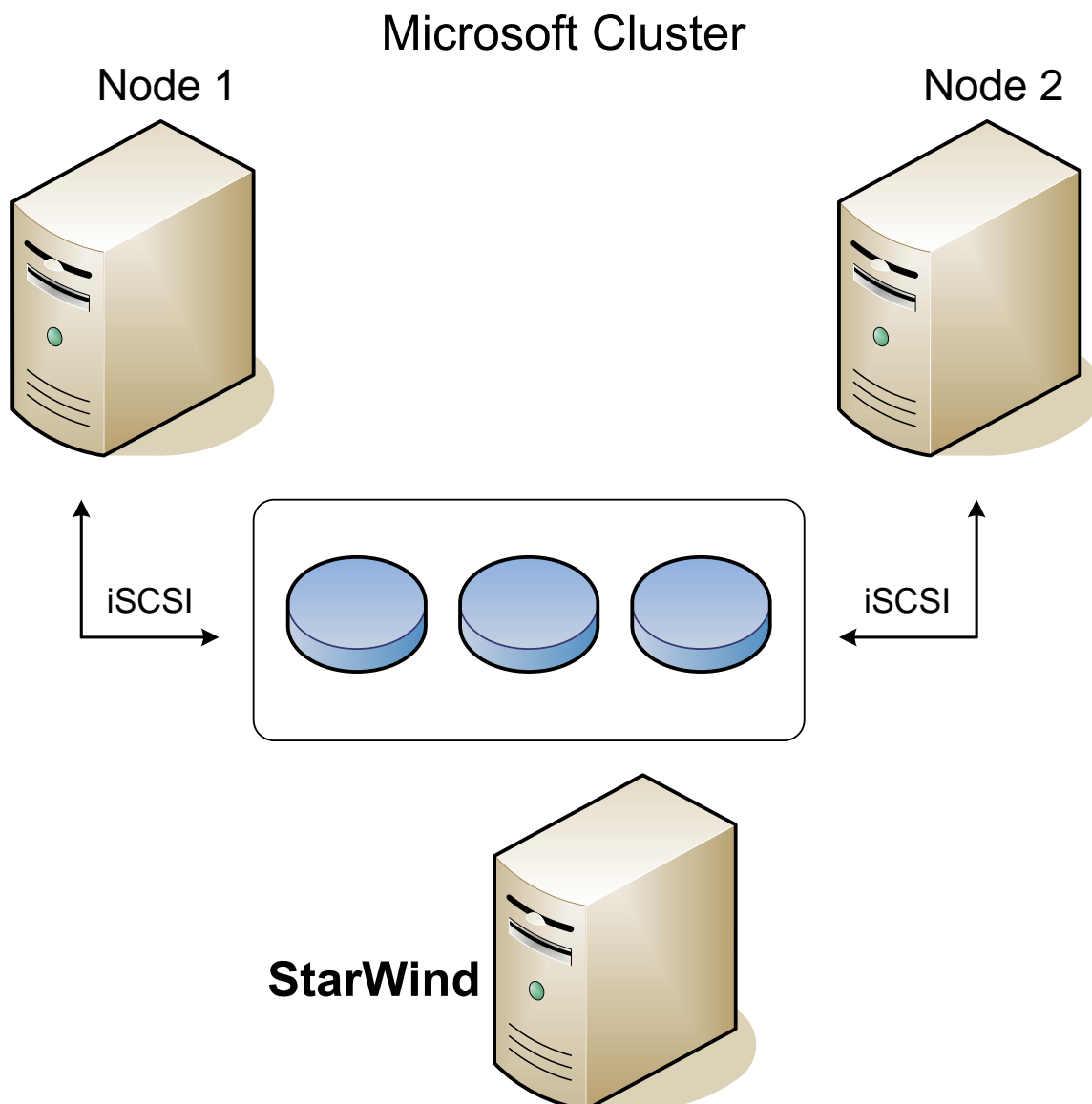


Figure 1. StarWind provides shared-disk resources to cluster

StarWind iSCSI Target for Microsoft Windows:

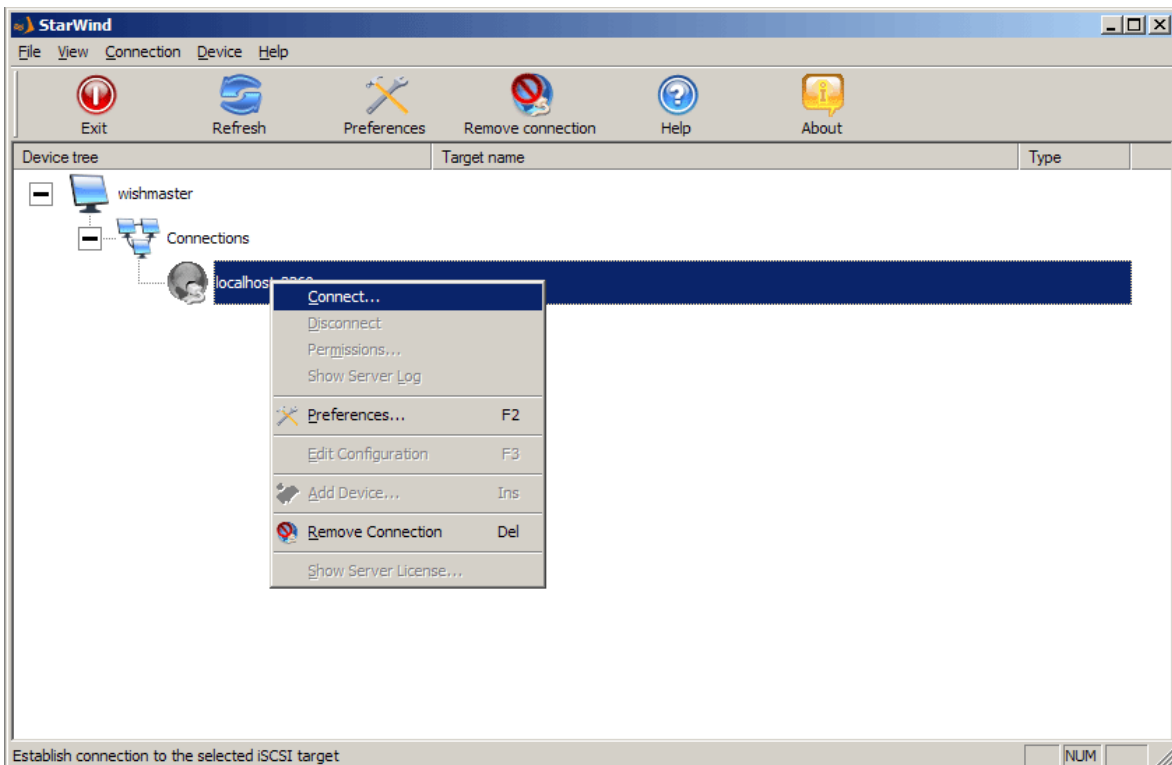
CONFIGURING ISCSI STORAGE

In this section you will learn how to prepare quorum and generic volumes that are required for fail-over cluster configurations using **StarWind**.

Please follow the instructions below to create the **Image File** device share:

Launch the StarWind console selecting **Start->All Programs->Rocket Division Software->StarWind->StarWind**. After the console is launched its icon appears in the system tray. Double click the icon with the left mouse button or single click it with the right and select **Start Management** menu item from the pop-up menu.

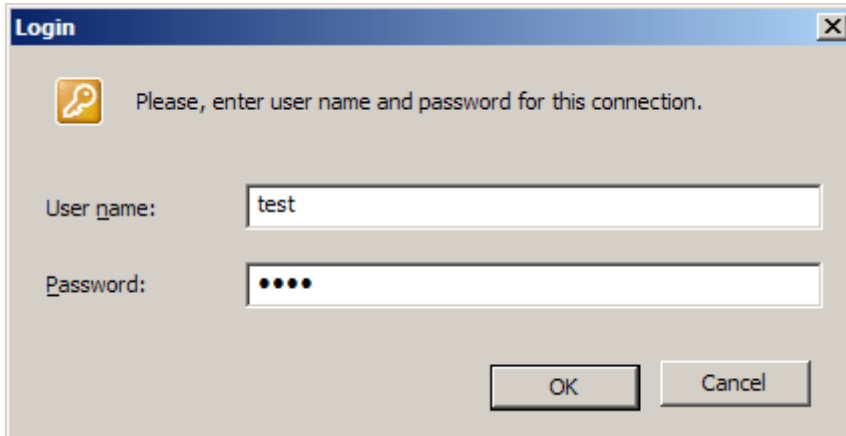
From the **Connections** tree please select the computer you wish to connect to. By default, there is a single item in the tree (localhost) which represents a loopback connection. Press the right mouse button over the desired host (computer) and select the **Connect...** menu item. You will be prompted to enter the login and password. Default ones are: **test, test**.



Select **Connect...** menu item to continue.

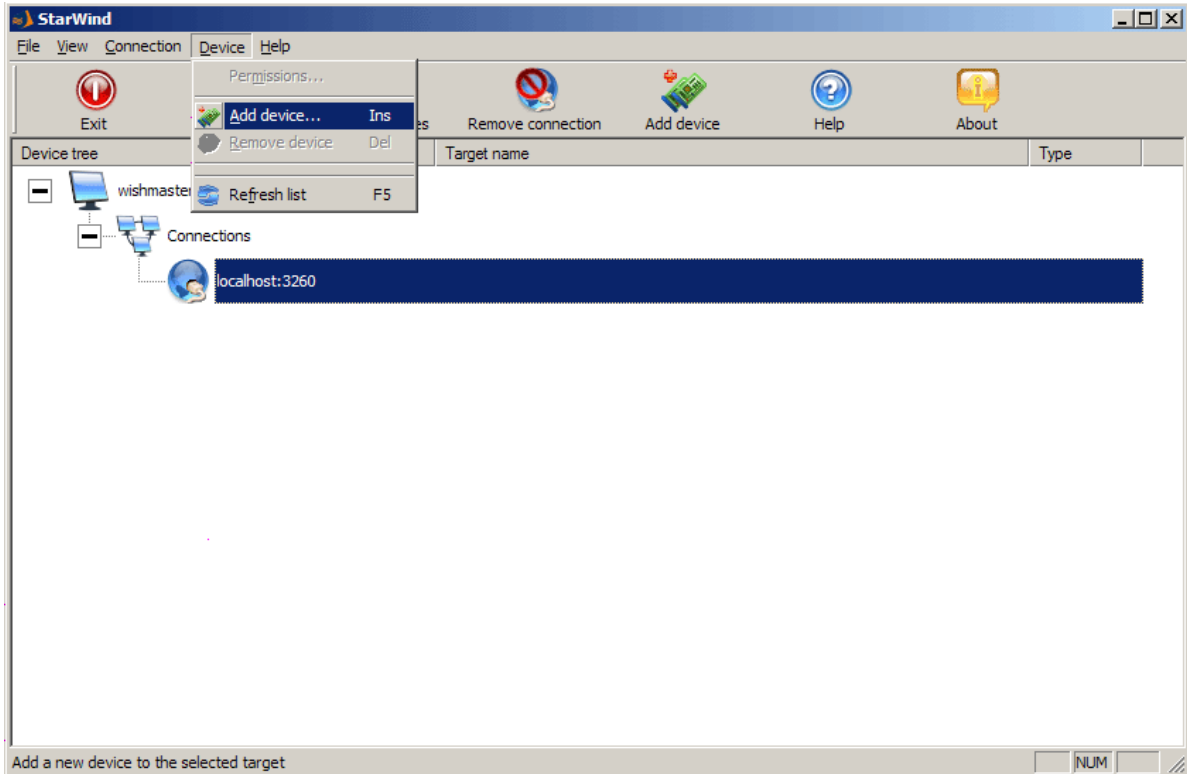
StarWind iSCSI Target for Microsoft Windows:

The Login dialog asking for the **User name** and the **Password** input looks like the one on the image shown below.



Press the **OK** button to continue.

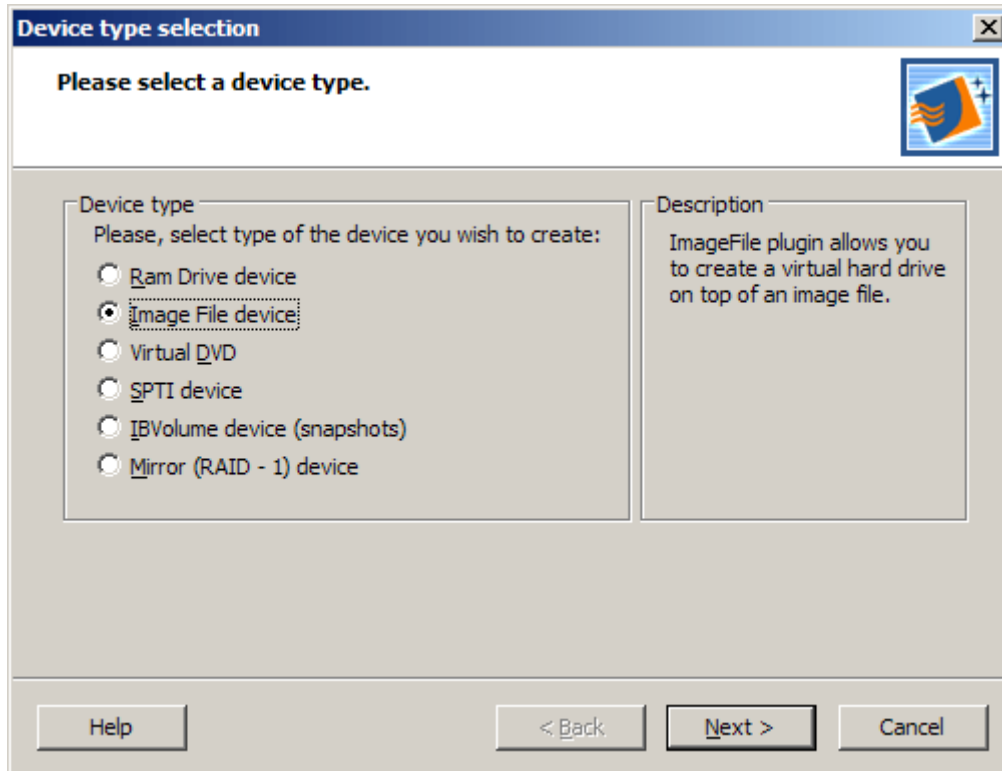
After you have successfully connected to the **StarWind** service on the remote machine, please expand the **Device** menu.



Select **Add device...** menu item to continue.

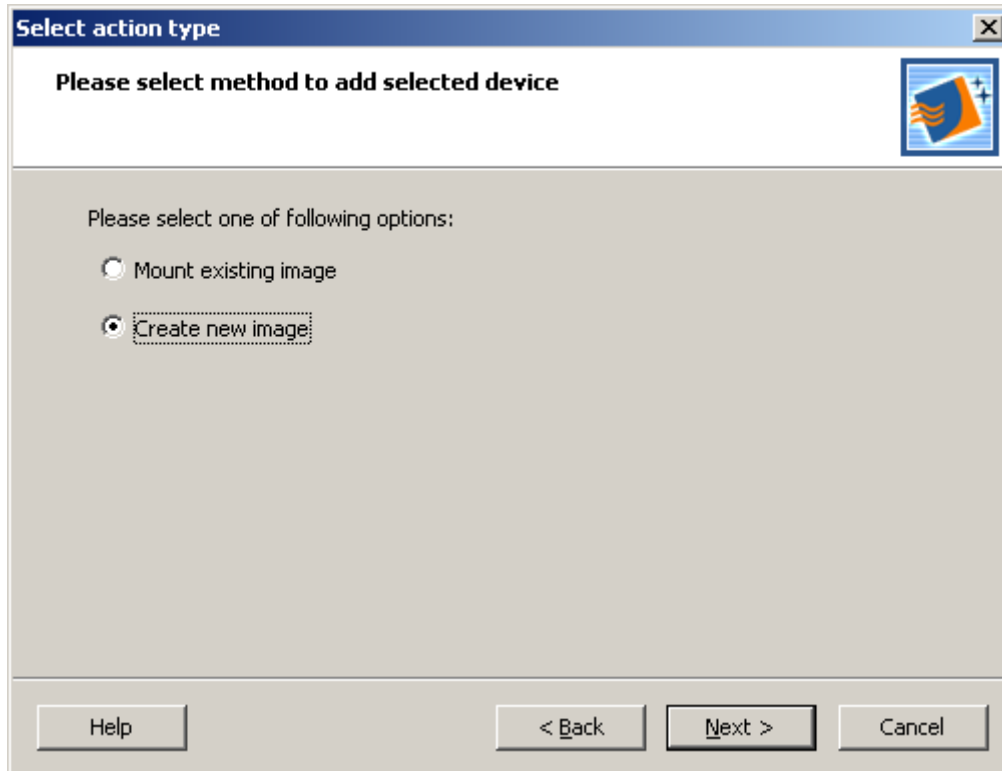
StarWind iSCSI Target for Microsoft Windows:

In the wizard that appears, please select **Image File device** (the brief description of each option is displayed in the right area of the wizard window). You can display the online help by pressing the **Help** button.



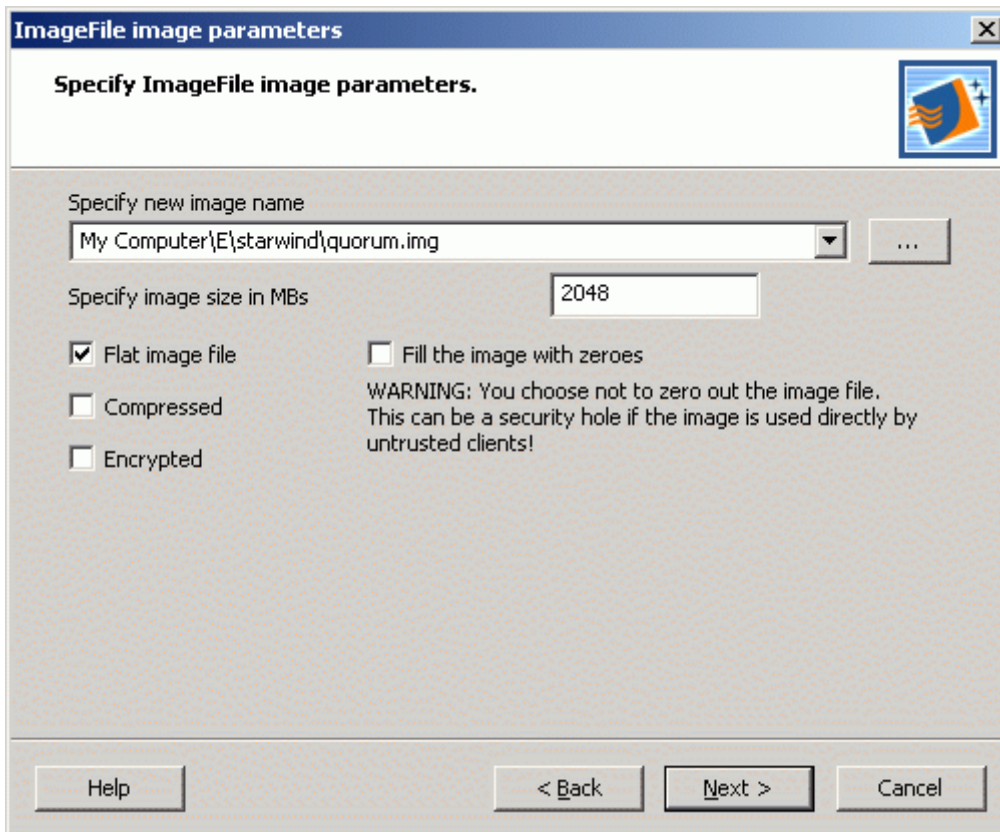
Press the **Next** button to continue.

Select **Create new image** to create a new hard disk image or **Mount existing image** to mount an existing image that you've prepared before.



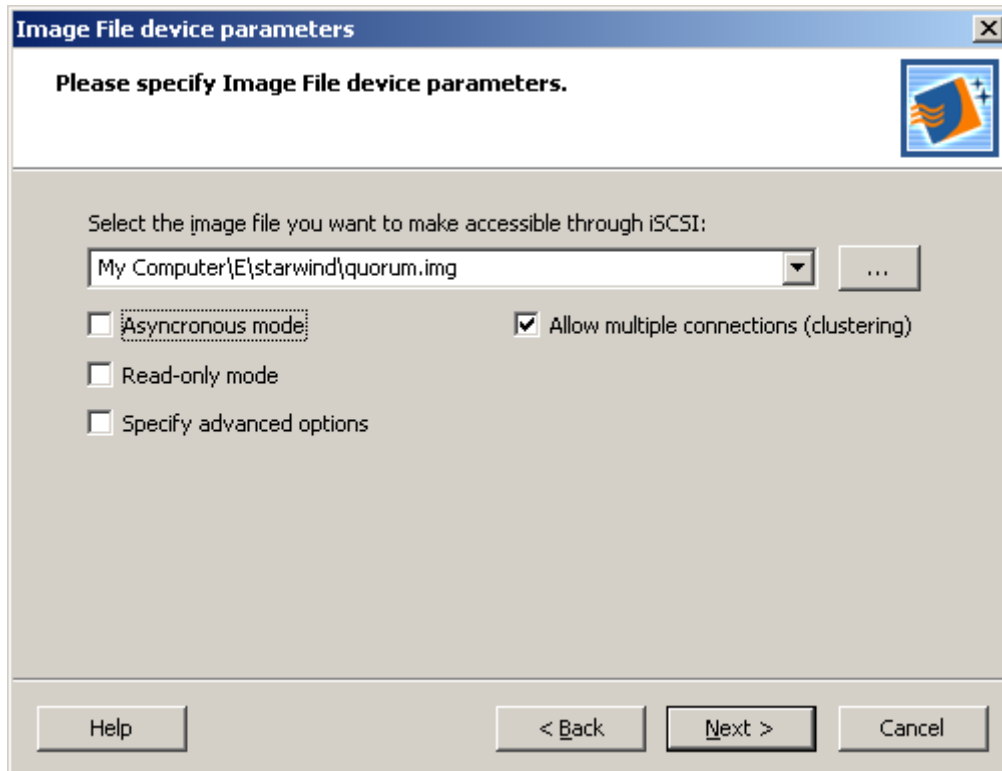
Press the **Next** button to continue.

If you have decided to create a new image file please specify the location and the name of the image you wish to be created. Also you have to provide the image size in megabytes. Check any additional parameters of the image you wish to create. Please refer to the online help for details regarding those additional parameters (**Flat image file**, **Compressed** and **Encrypted**).



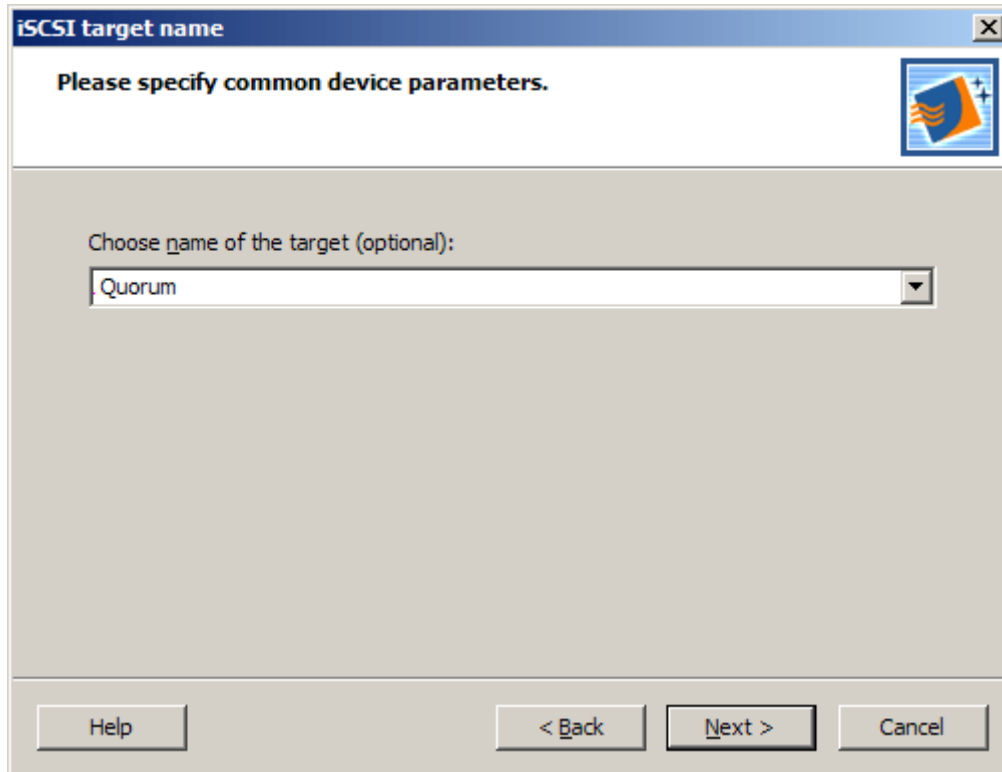
Press the **Next** button to continue.

Image file device has some extra parameters. Please refer to the online help for details regarding those additional parameters (**Asynchronous mode**, **Allow multiple connections (clustering)**, **Read-only mode** and **Specify advanced options**). Check **Allow multiple connections (clustering)** checkbox.



Press the **Next** button to continue.

Select an optional target name. Under this target name, the device will be declared to the iSCSI initiators connecting to the **StarWind** over an IP network.



Press the **Next** button to continue.

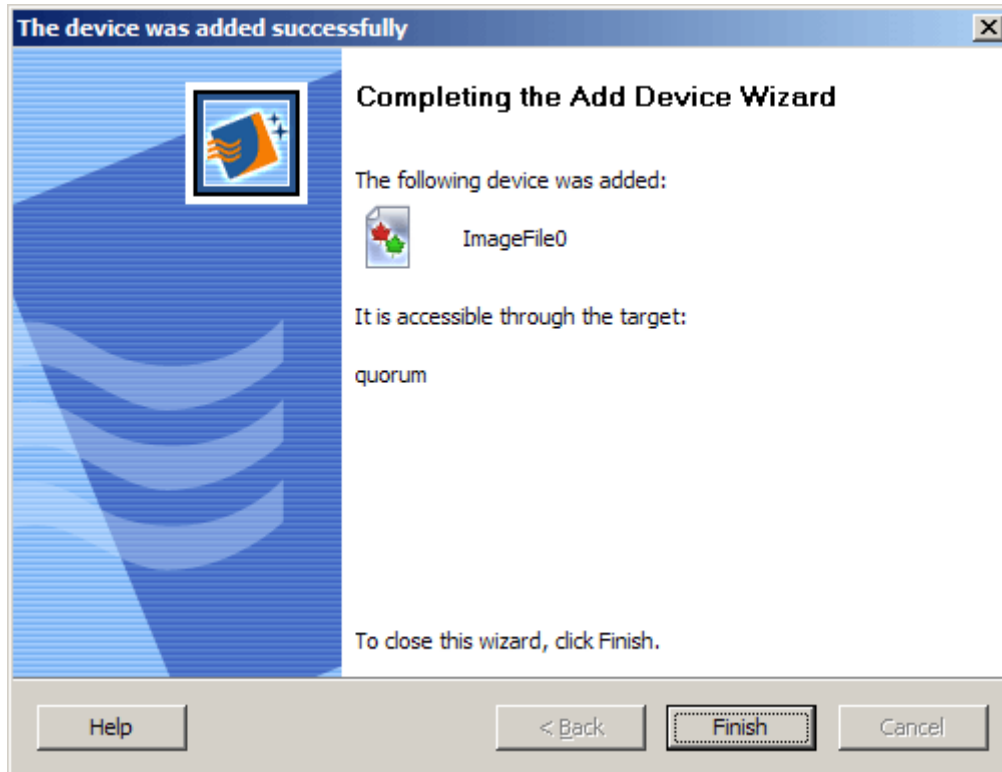
Check if all of the device parameters are correct. Press the **Back** button if any changes are required.



Press the **Next** button to continue.

StarWind iSCSI Target for Microsoft Windows:

The information about the recently created device is displayed on the last wizard page (see image below).

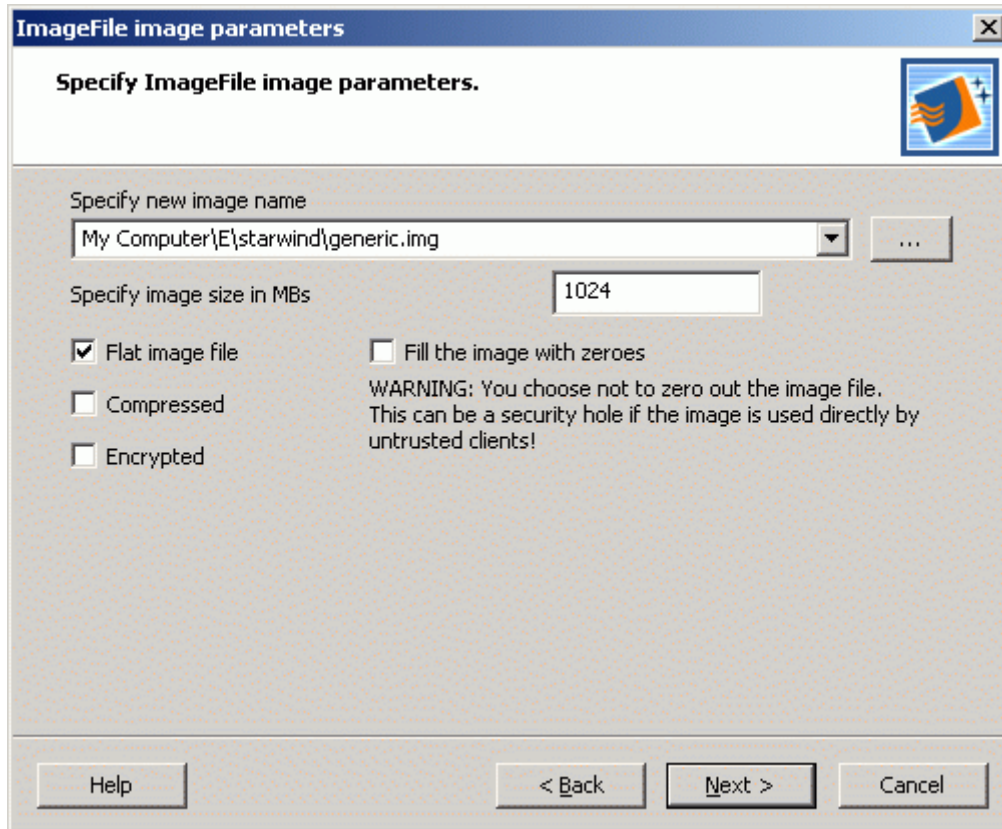


Press the **Finish** button to close the wizard.

Repeat the same procedures to create another **StarWind** disk, which will be used as a generic cluster disk.

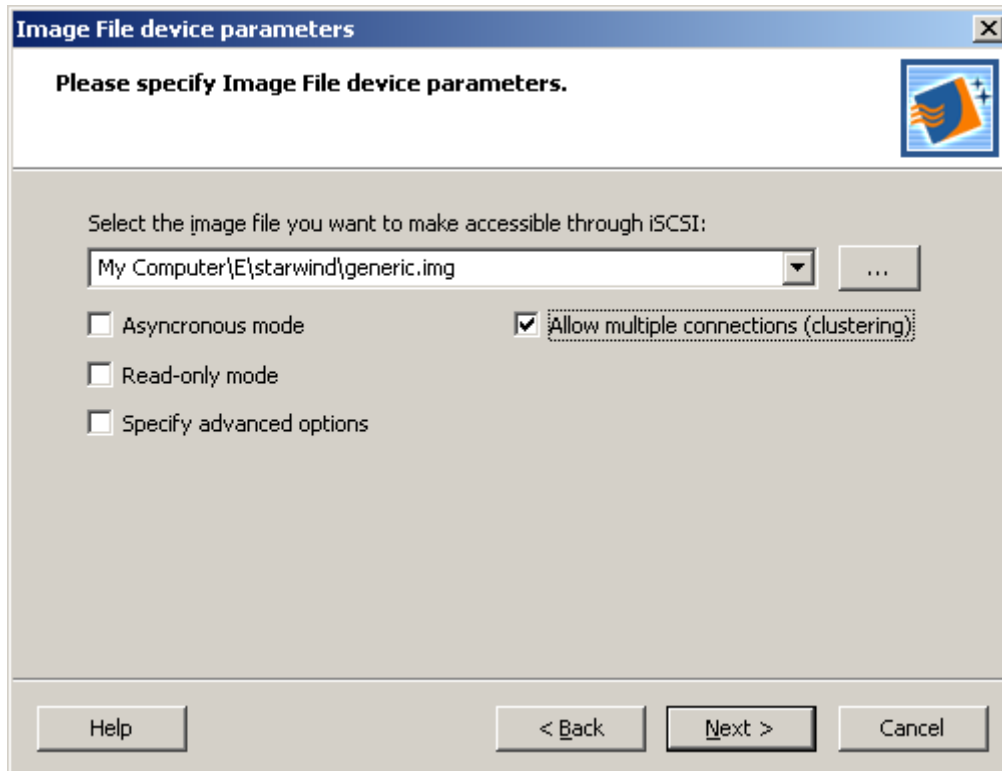
StarWind iSCSI Target for Microsoft Windows:

Specify the location and the name of the image you wish to be created. Also you have to provide the image size in megabytes. Check any additional parameters of the image you wish to create.



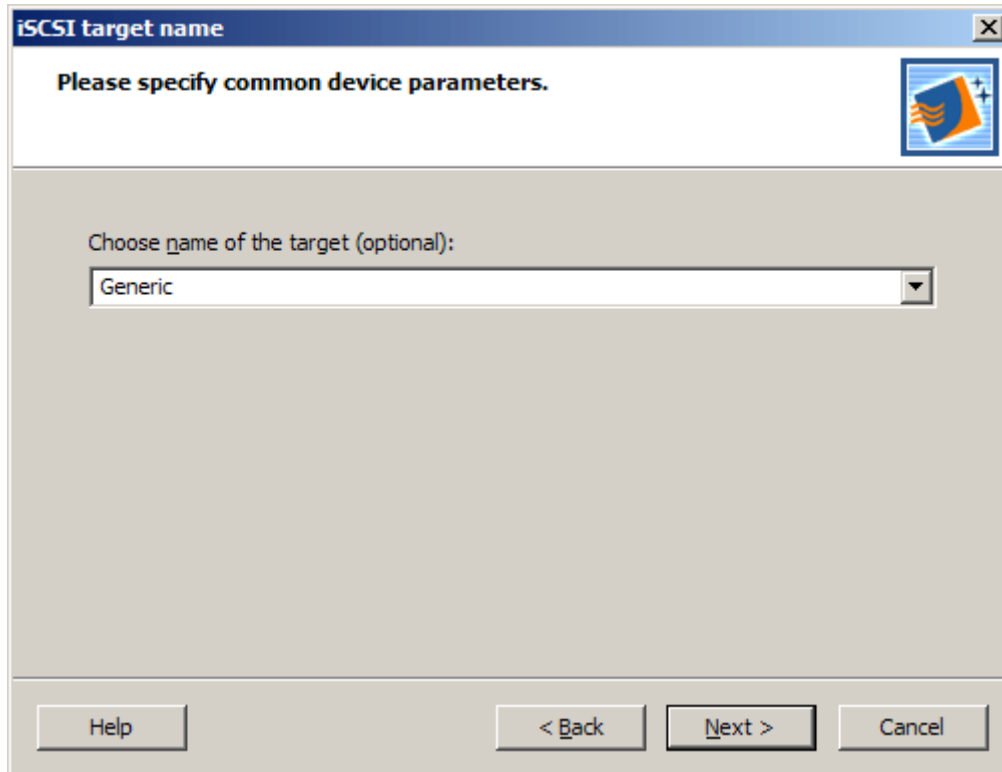
Press the **Next** button to continue.

Image file device has some extra parameters. Please refer to the online help for details regarding those additional parameters (**Asynchronous mode**, **Allow multiple connections (clustering)**, **Read-only mode** and **Specify advanced options**). Check **Allow multiple connections (clustering)** checkbox.



Press the **Next** button to continue.

Select an optional target name. Under this target name, the device will be declared to the iSCSI initiators connecting to the **StarWind** over an IP network.



Press the **Next** button to continue.

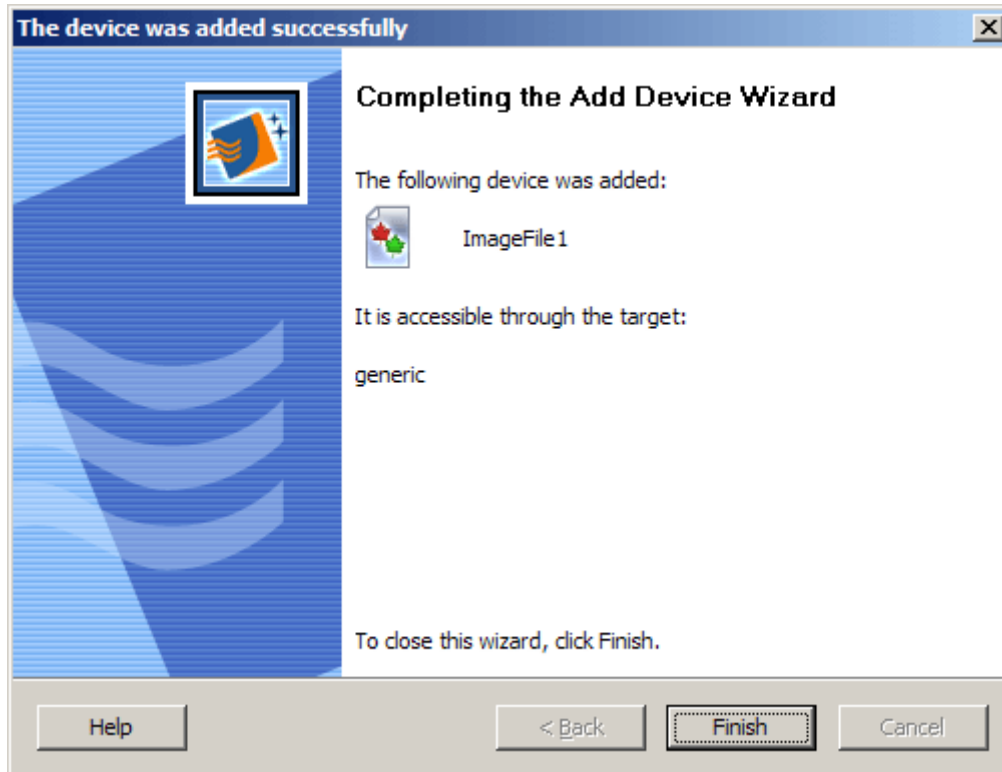
Check if all of the device parameters are correct. Press the **Back** button if any changes are required.



Press the **Next** button to continue.

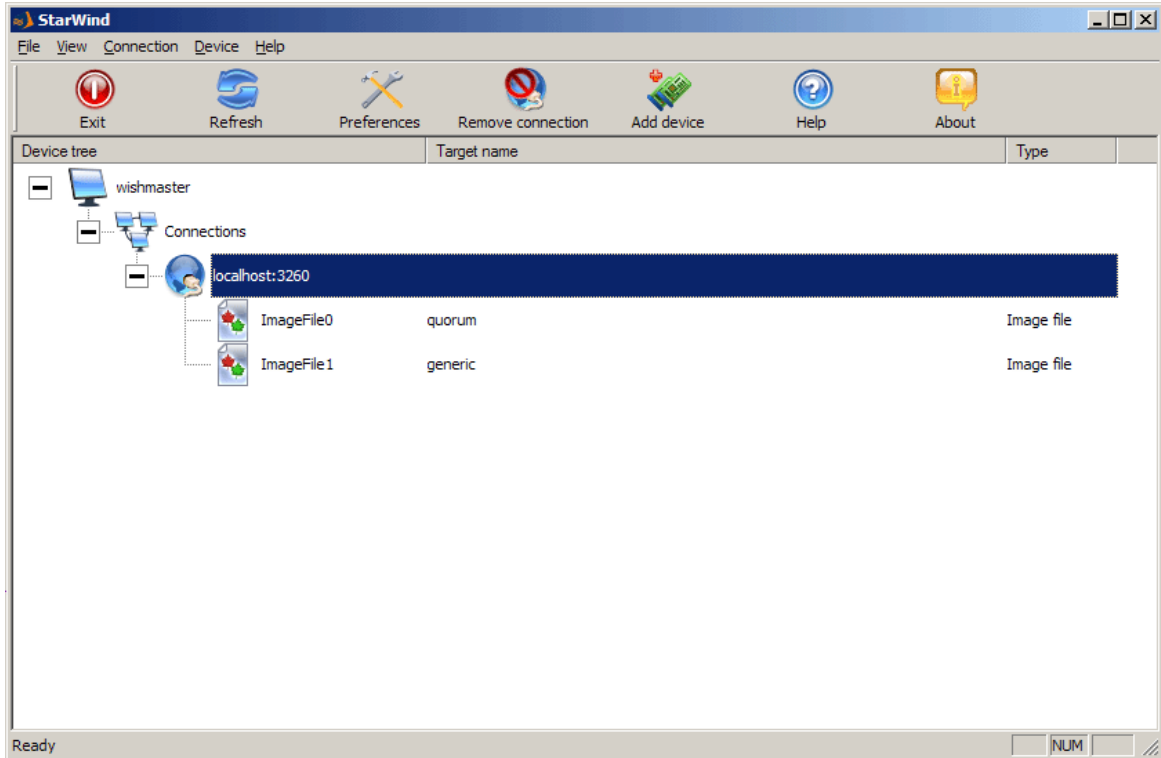
StarWind iSCSI Target for Microsoft Windows:

The information about the recently created device is displayed on the last wizard page (see image below).



Press the **Finish** button to close the wizard.

If everything went fine, the StarWind console should look like the sample image provided below.



StarWind iSCSI Target for Microsoft Windows:

CONFIGURING INITIATORS

The **MS iSCSI Initiator** is a free application that is available for is downloading from the Microsoft Web site:

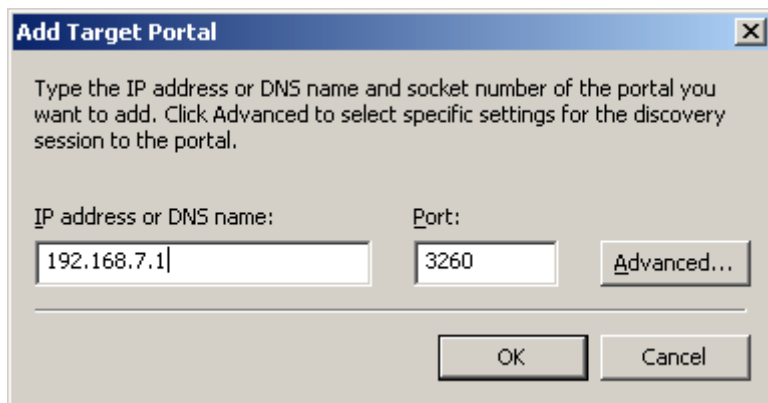
<http://www.microsoft.com/downloads/details.aspx?FamilyID=12cb3c1a-15d6-4585-b385-befd1319f825&displaylang=en>.

The **MS iSCSI Initiator** is required to connect to the iSCSI devices.

Before continuing, ensure that the MS iSCSI Initiator is installed on both cluster machines.

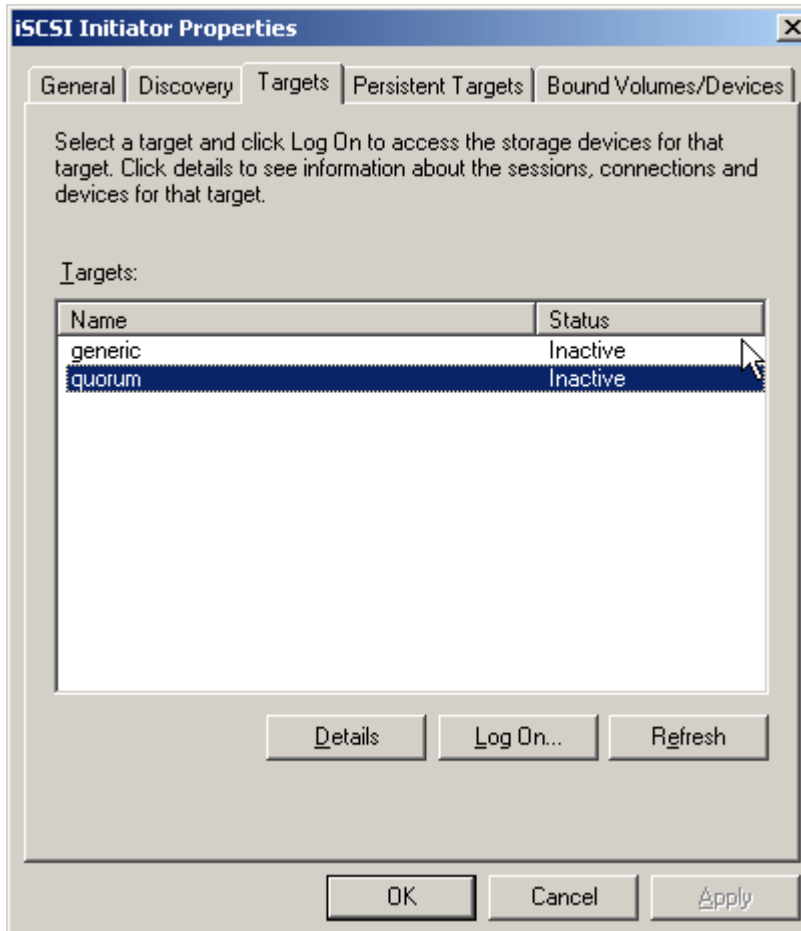
CLUSTER NODE 1 INITIATOR

Log on to the cluster **node 1 server** using an account with administrative privileges. Launch MS iSCSI Initiator. Select the **Discovery** tab. In the **Target Portals** group, press **Add**. In the **Add Target Portal** dialog box, enter the **IP Address** or **DNS name** of the **StarWind** storage server.



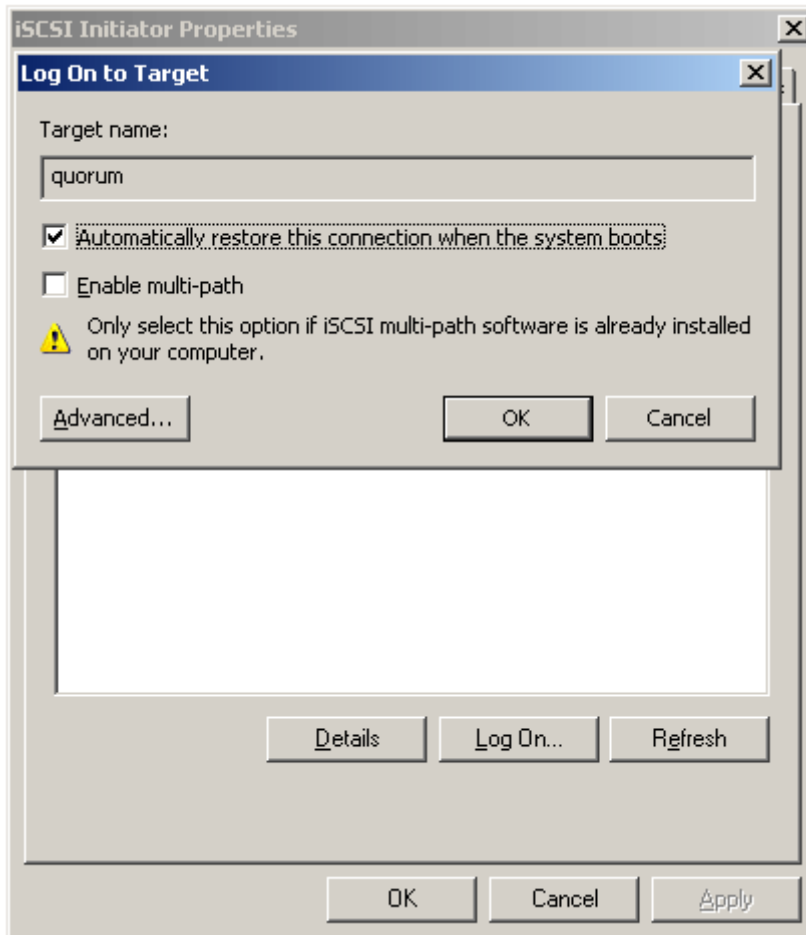
Press the **OK** to close the dialog.

Switch to the **Targets** tab. Select the **IQN** of the target just added.



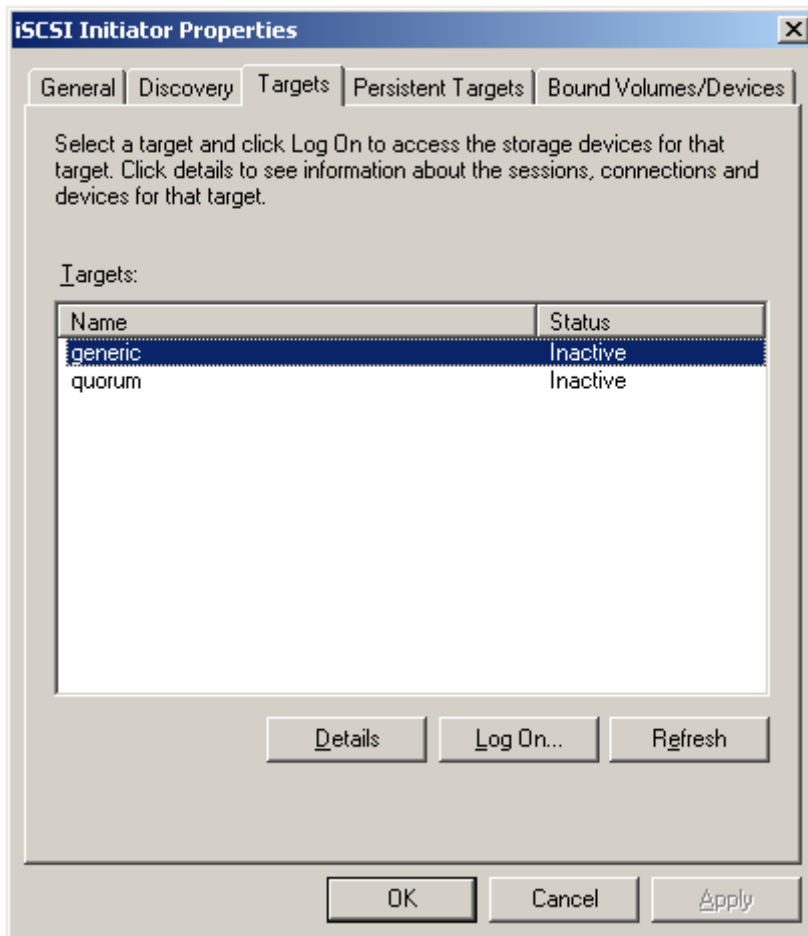
Press the **Log On** button.

The **Log On to Target** dialog box now appears. In this dialog select the checkbox **Automatically restore this connection** to make this connection persistent.

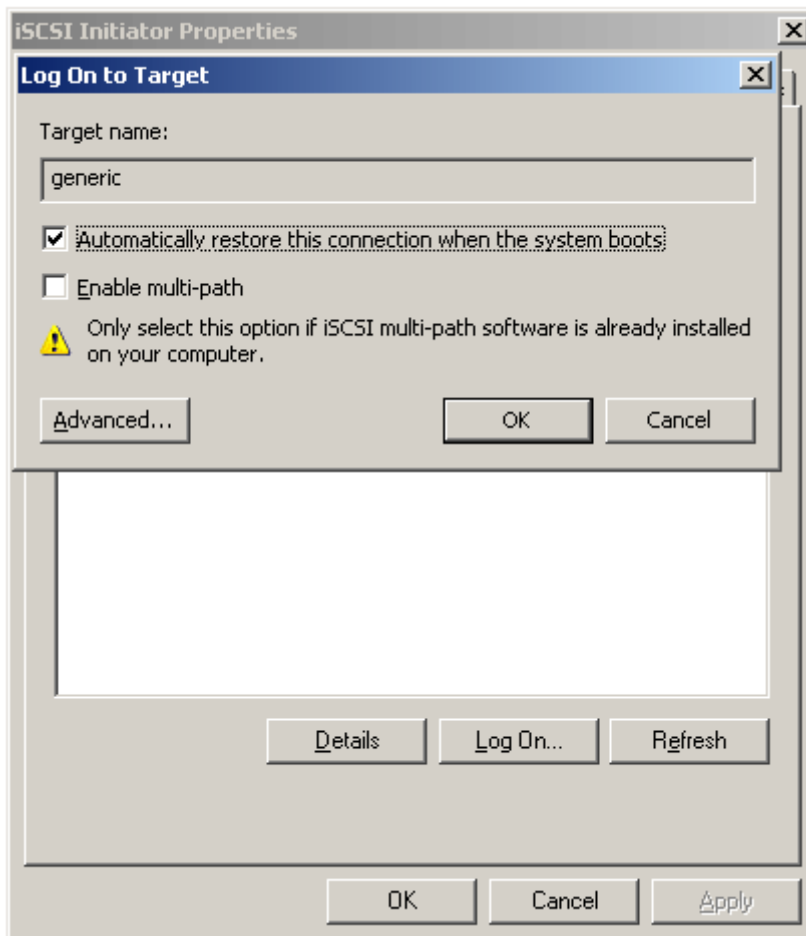


Press the **OK** to close the dialog box and complete the operation. If successful, the initiator is now logged on to **StarWind**.

Perform the same operations under the generic volume.



StarWind iSCSI Target for Microsoft Windows:



StarWind iSCSI Target for Microsoft Windows:

CLUSTER NODE 2 INITIATOR

Log on to the cluster node 2 server using an account with administrative privileges. Follow the steps in the Cluster Node 1 section above to logon to StarWind.

Shut down the computer. Ensure that this computer is completely shut down before continuing.

StarWind iSCSI Target for Microsoft Windows:

INITIALIZE ISCSI DEVICES

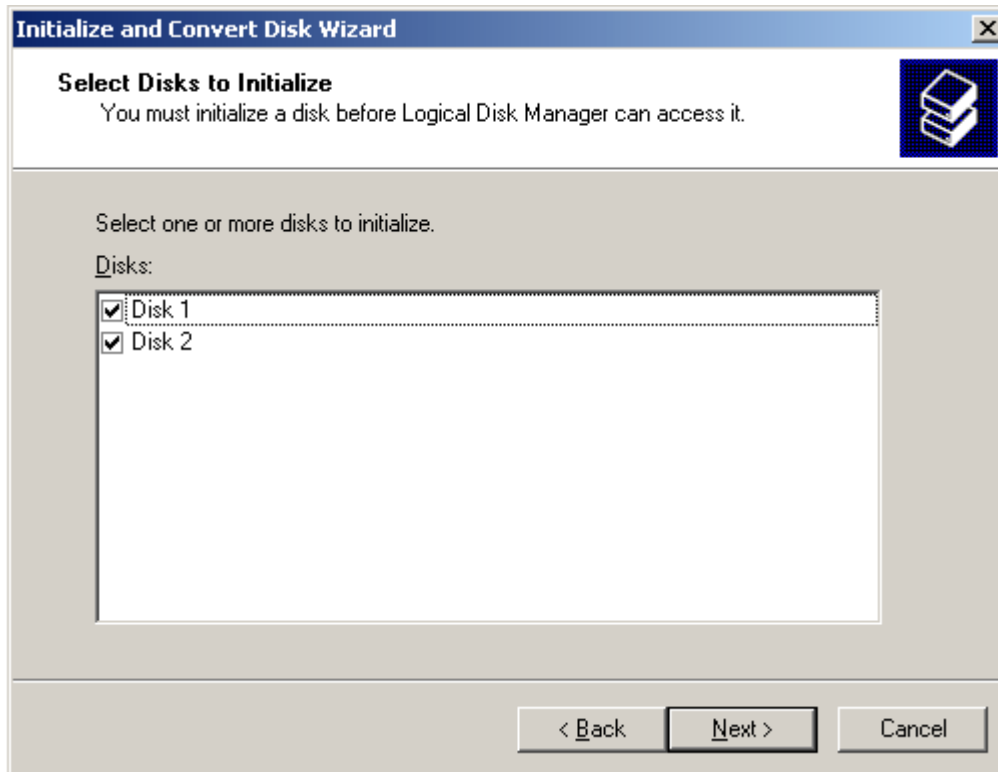
When a **StarWind** disk is ready, it appears on the initiator host as a new disk device. Before a new disk can be used in the cluster, you have to initialize and format it.

Log on to the cluster **node 1** server using an account with administrative privileges. Launch the **Computer Management** console. Select **Disk Management**.

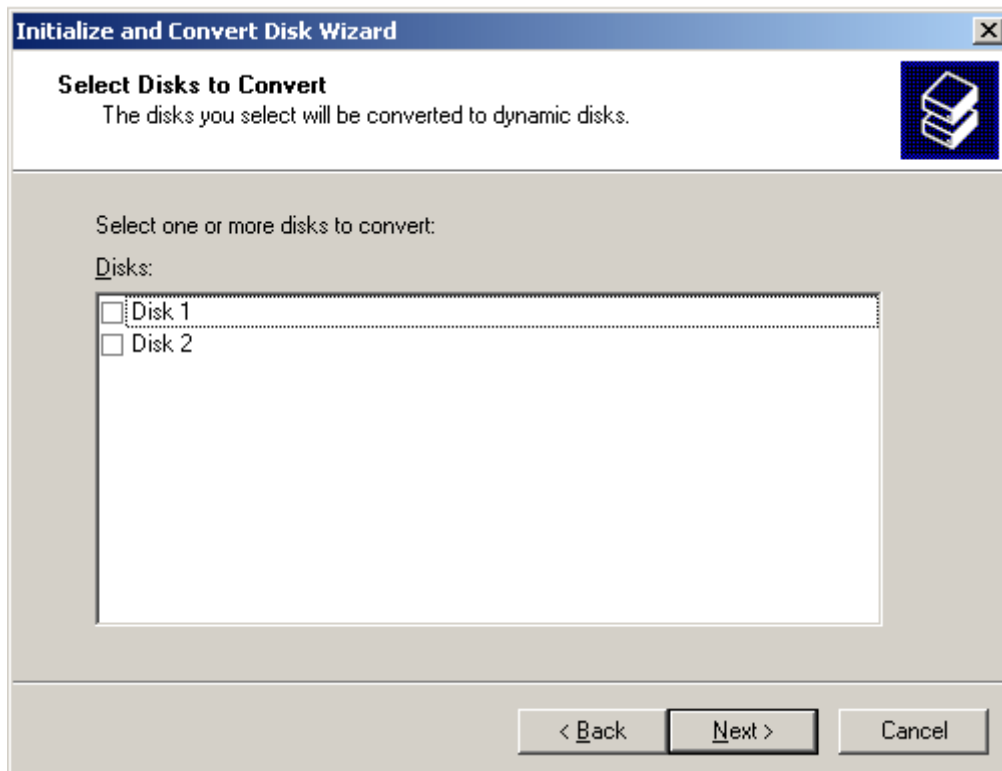
Follow the **Wizard** to initialize the new disks. Use the default settings that Windows provides. By default the disk will be initialized as the basic disk. MSCS works only with the basic disks.



Press the **Next** button to continue.

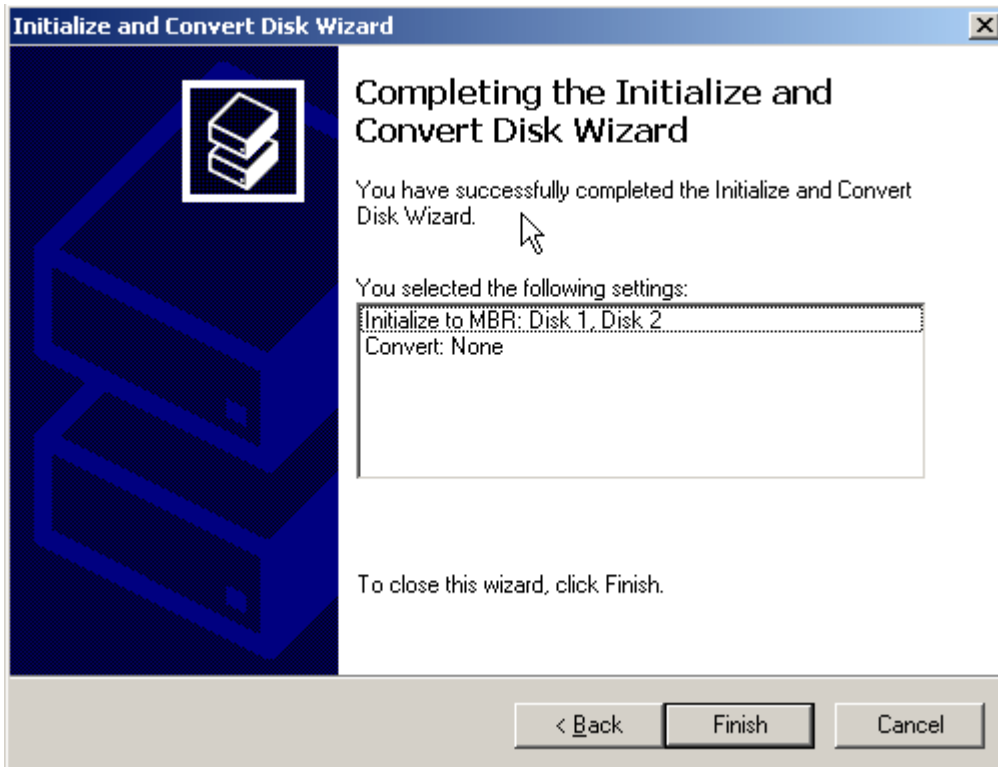


Press the **Next** button to continue.



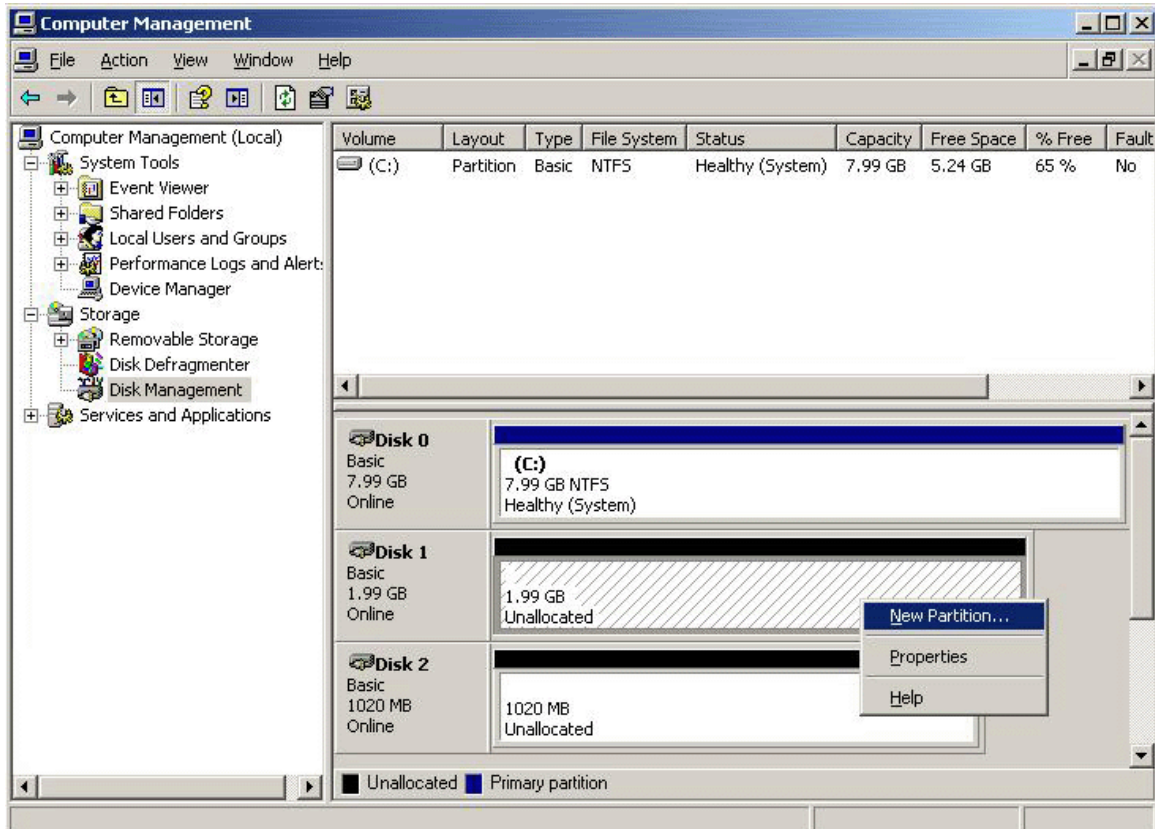
StarWind iSCSI Target for Microsoft Windows:

Press the **Next** button to continue.



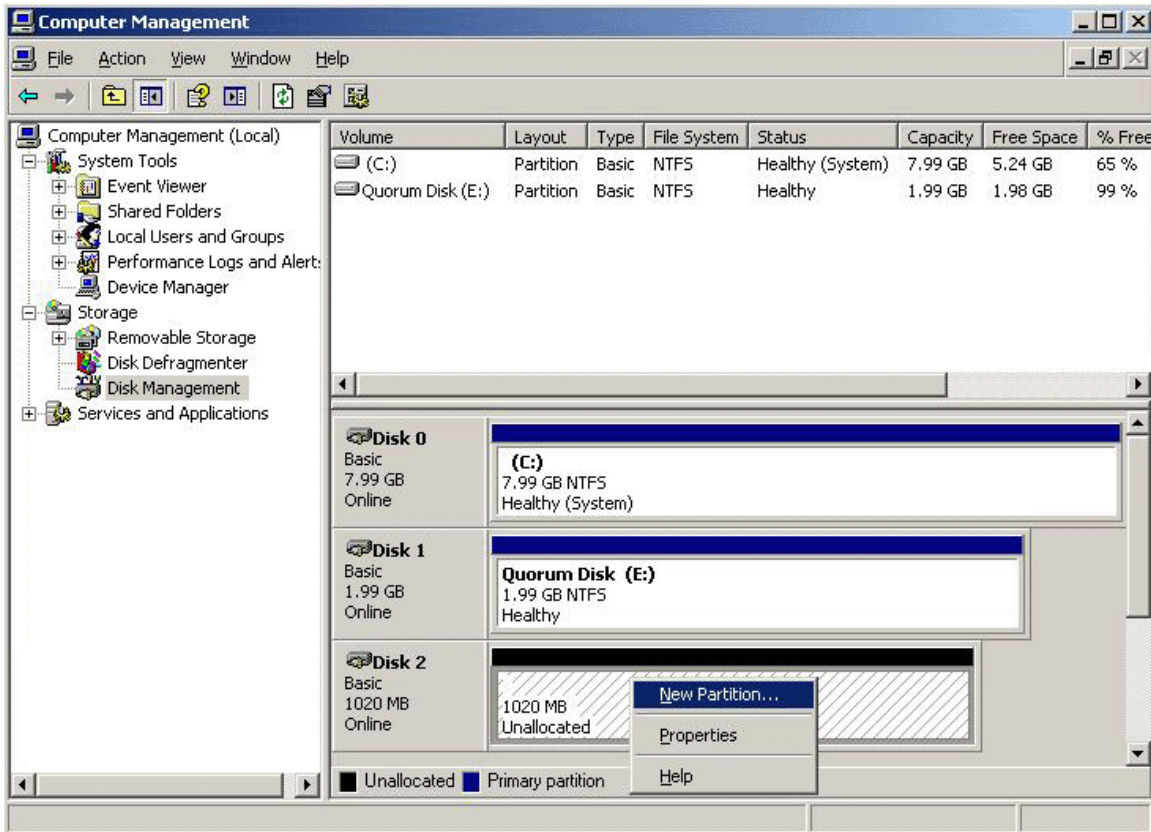
Press the **Finish** button to close the wizard.

After the Wizard completes initialization, press the right mouse button on the unallocated space and select **New Partition**. Follow the instructions of the wizard to create an **NTFS** partition for use as the **quorum** disk. Use the default settings that Windows provides. (The default settings are sufficient for most environments.)



StarWind iSCSI Target for Microsoft Windows:

Repeat the above step for the other disk device. This new partition is the generic cluster disk.



StarWind iSCSI Target for Microsoft Windows:

Shut down this server. When this server is completely shut down, restart the cluster **node 2** server.

Log in with administrative privileges.

Launch **Computer Management** and select **Disk Management**. The two disks that were formatted on the cluster **node 1** server should now appear without any drive letter mounted. Assign the same letters to those that were used when these drives were formatted.

Shut down the cluster node 2 server. When the cluster node 2 server is completely shut down, restart the cluster node 1 server.

NOTE: If there are more than two nodes in the cluster, repeat the steps above to initialize the StarWind Disks on all the cluster servers before continuing.

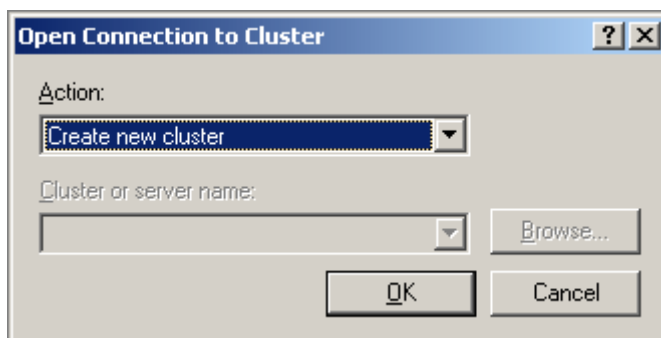
CONFIGURING MICROSOFT CLUSTER SERVICE

At this point, all the necessary shared storage have been created. The remaining task is to create the cluster and configure it to use these resources.

CREATING CLUSTER

On the cluster **node 1** server, launch the **Cluster Administrator console**.

Select **Create new cluster** from the **Action** drop-down list of the **Open Connection to Cluster** dialog box.



Press the **OK** button to continue.

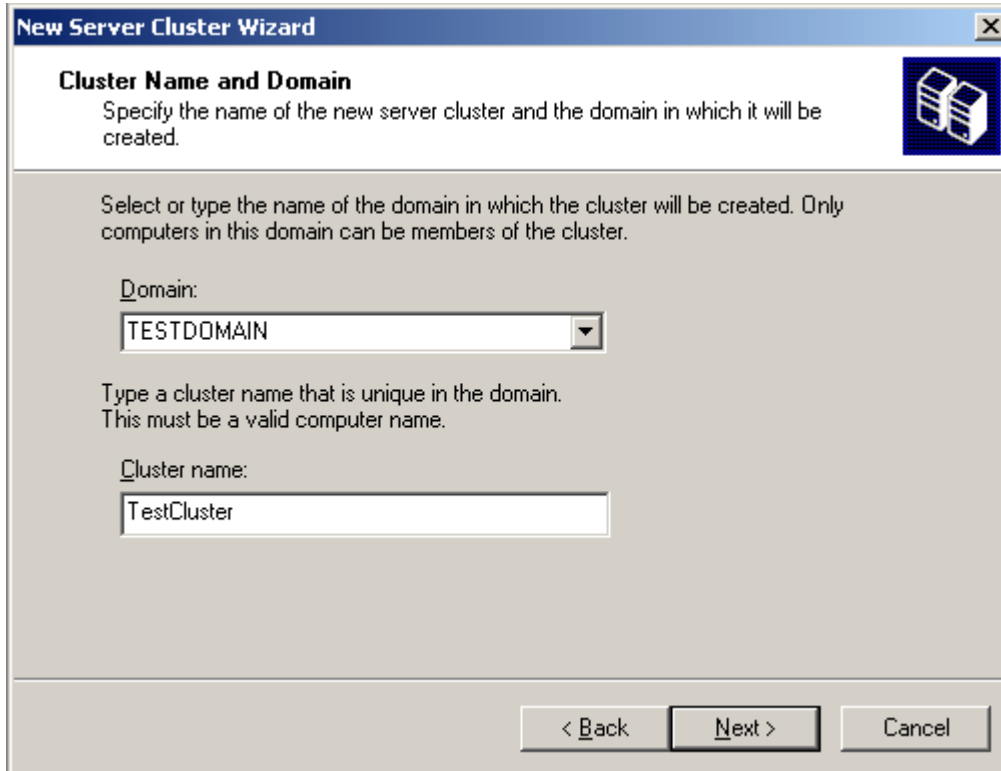
New Server Cluster Wizard welcome page appears.



Press the **Next** to continue.

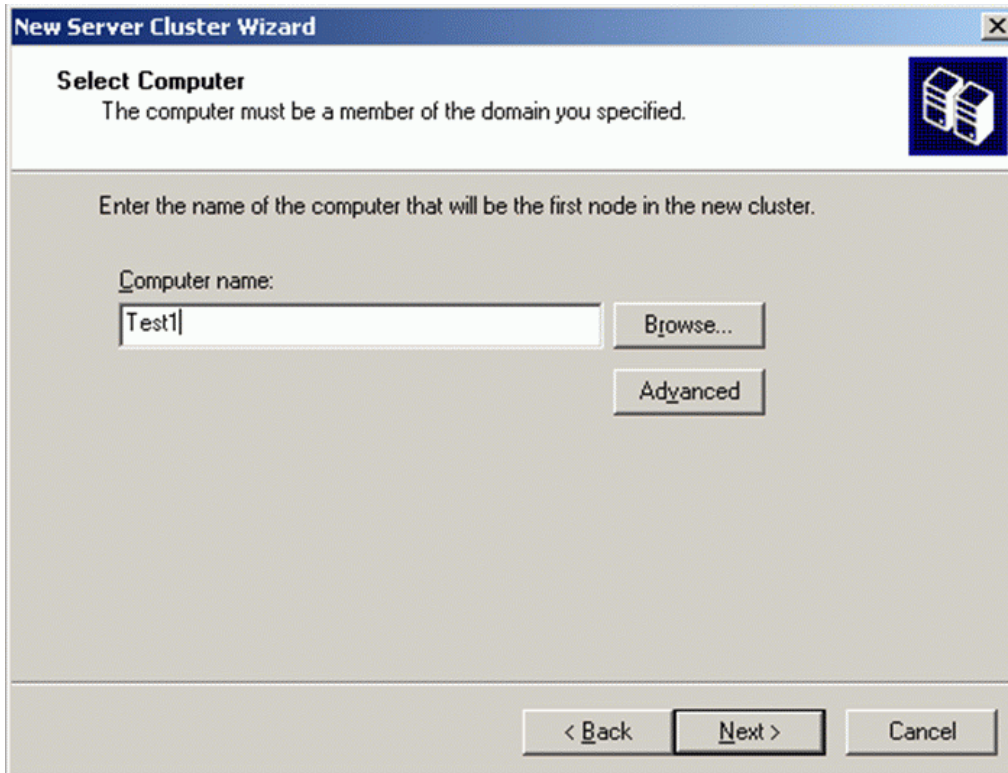
StarWind iSCSI Target for Microsoft Windows:

On the **Cluster and Domain Name** page, specify the appropriate cluster and domain names.



Press the **Next** to continue.

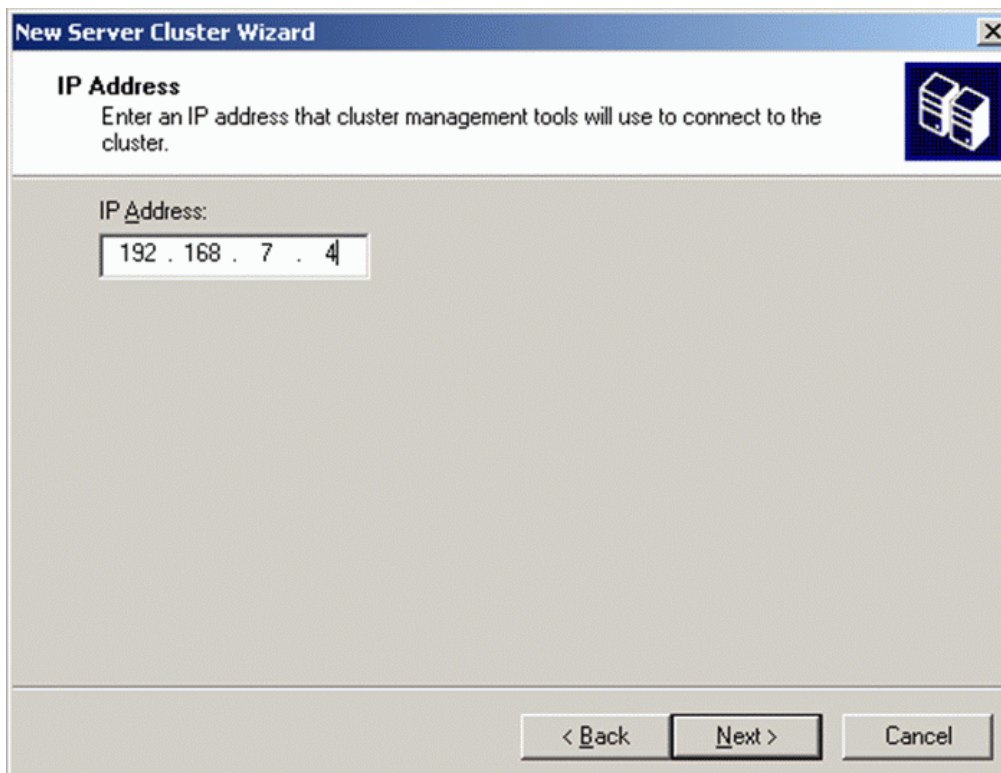
On the **Select Computer** page of the wizard, the computer name of the first node in the cluster should already be filled in. If not, specify the name of the computer in the edit box.



Press the **Next** to continue.

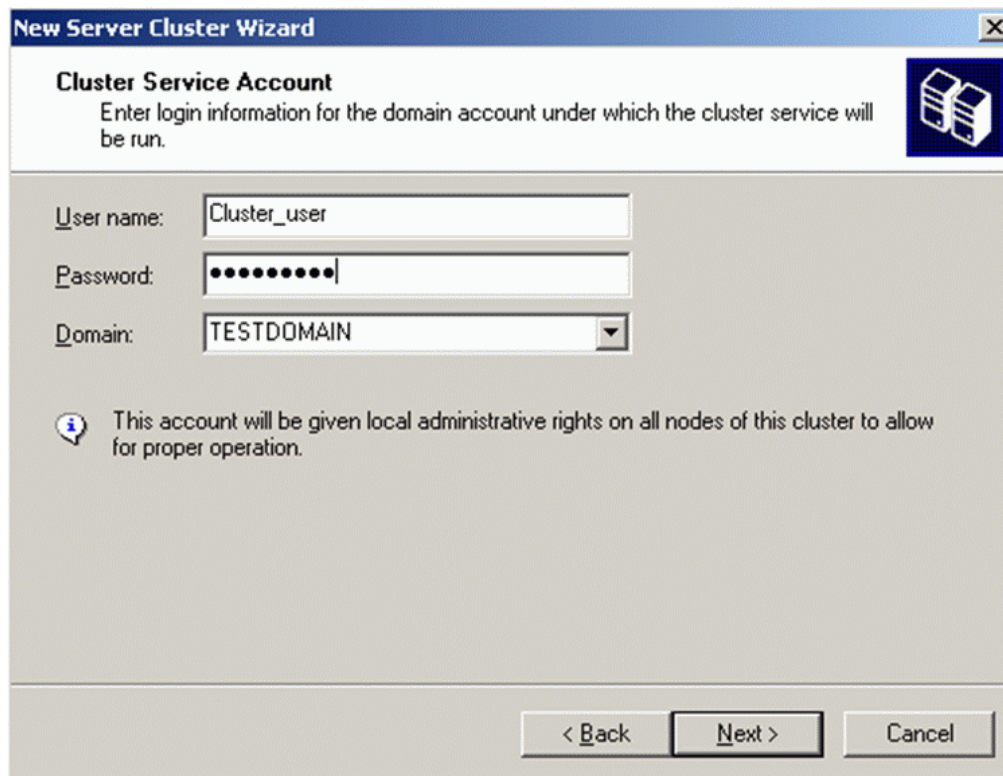
The wizard will analyze the settings, including the shared resource and network connectivity. If everything goes well, the **Next** button becomes enabled. If any errors occurred, review the information and correct the errors before proceeding. Press the **Next** button to continue.

On the **IP Address** page, specify the **IP address** for the cluster. This address maps to the cluster name and should not be used by other computers.



Press the **Next** to continue.

On the **Cluster Service** account page specify the domain account that the service will run as. This account must be a domain user and have administrative privileges.




New Server Cluster Wizard

Cluster Service Account
Enter login information for the domain account under which the cluster service will be run.

User name: Cluster_user

Password: ●●●●●●●●

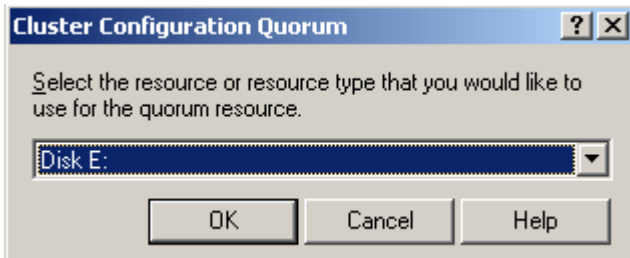
Domain: TESTDOMAIN

 This account will be given local administrative rights on all nodes of this cluster to allow for proper operation.

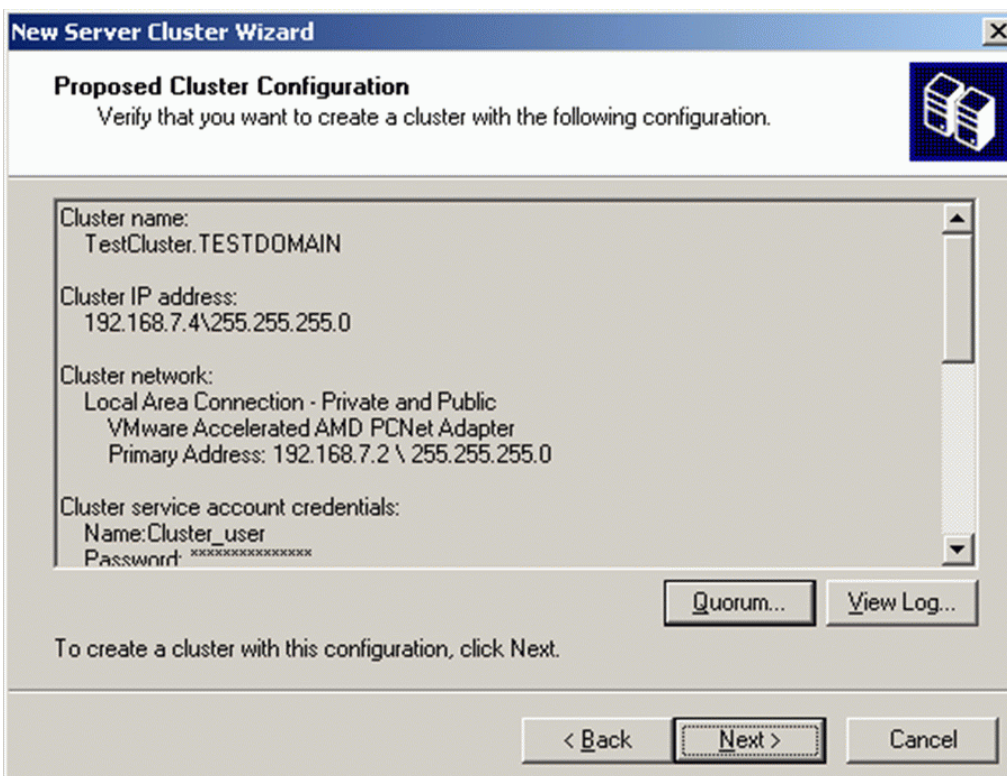
< Back Next > Cancel

Press the **Next** to continue.

Verify that all information on the **Proposed Cluster Configuration** page is correct. Configure the quorum settings (Press the **Quorum...** button and select the disk to be used as quorum).

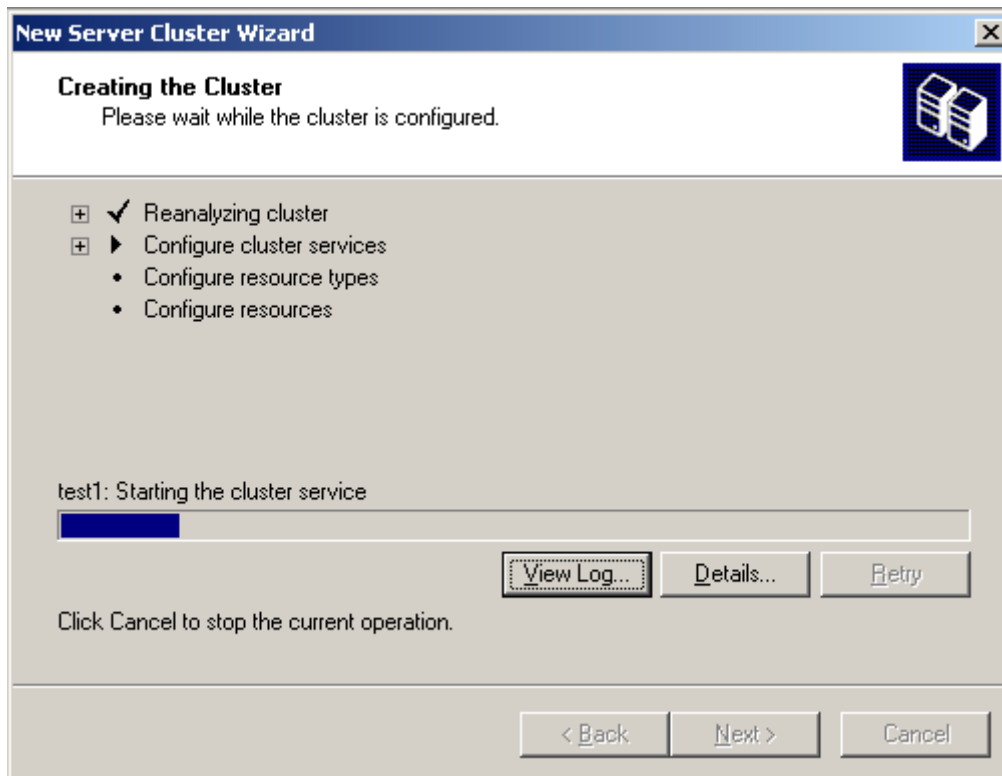


Press the **OK** button to continue.

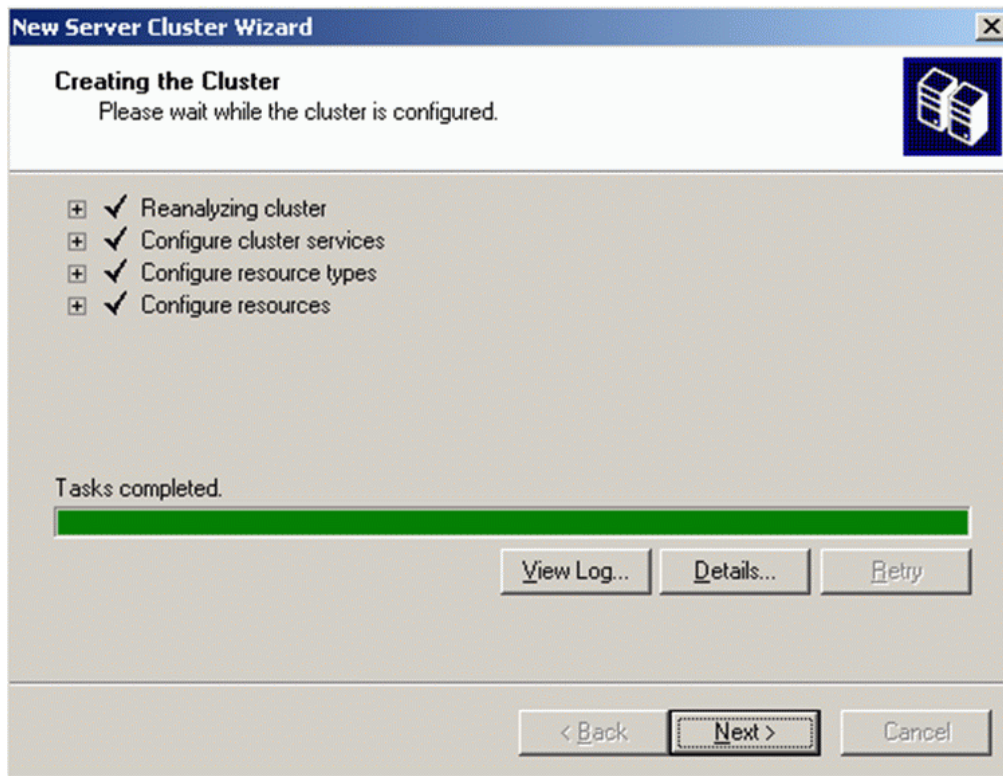


Press the **Next** to create the cluster.

The wizard will attempt to create the cluster. The process may take a few minutes. If there any errors occurred, review the log and error messages to solve the problem.

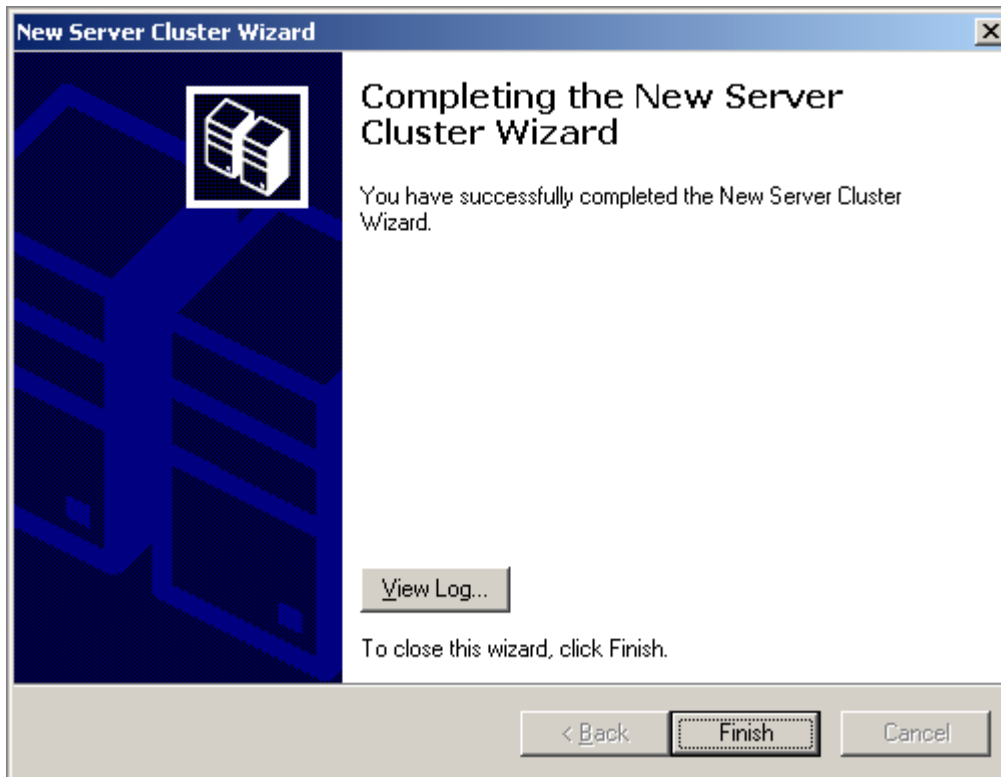


When complete, the **Next** button becomes enabled.



Press the **Next** button to continue.

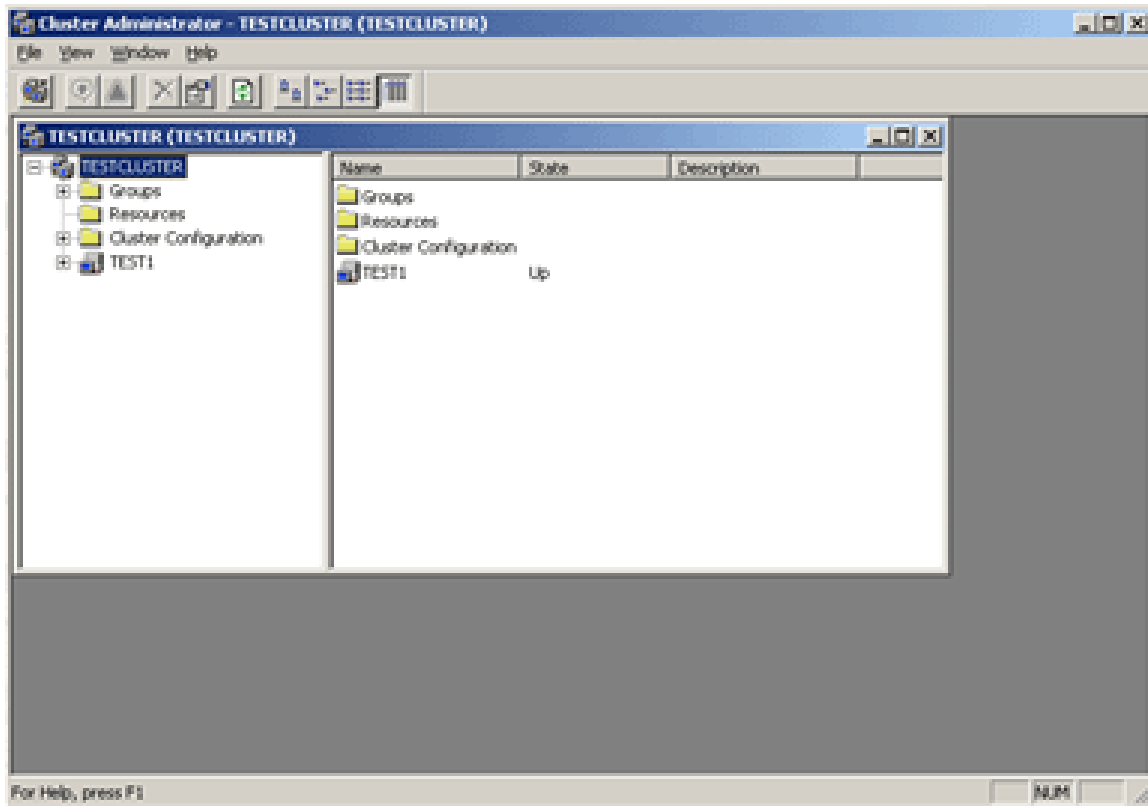
Completing the New Server Cluster Wizard dialog appears.



Press the **Finish** to complete the task. The cluster is now operational and additional nodes can be added to the cluster.

StarWind iSCSI Target for Microsoft Windows:

In result, the new cluster is created.



StarWind iSCSI Target for Microsoft Windows:

ADDING NEW NODE

Turn on the cluster **node 2** server.

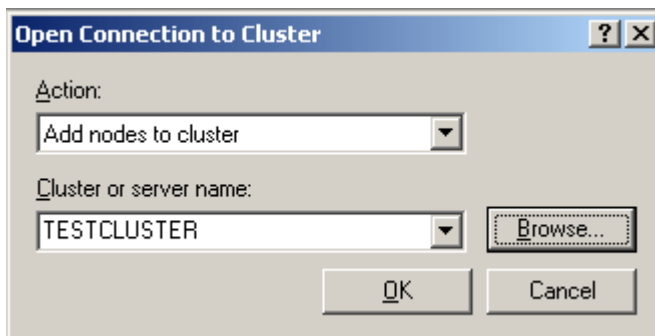
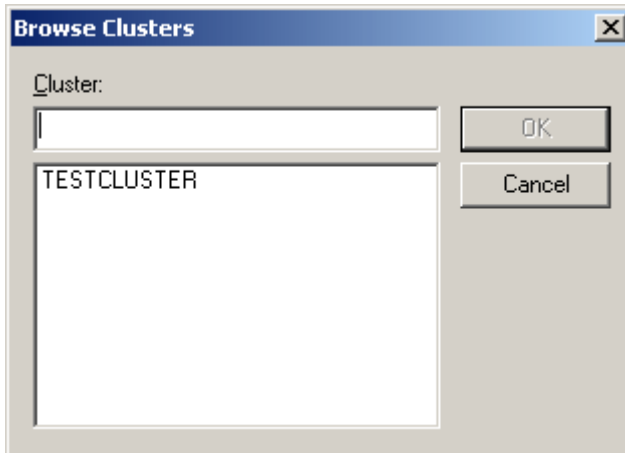
Log on to the server using an account with administrative privileges. Launch the **Cluster Administrator console**.

Select **Add nodes to cluster** from the **Action** drop-down list of the **Open Connection to Cluster** dialog box.



Press the **Browse** button to continue.

Specify the name of the recently created cluster in the **Cluster or server name** list.



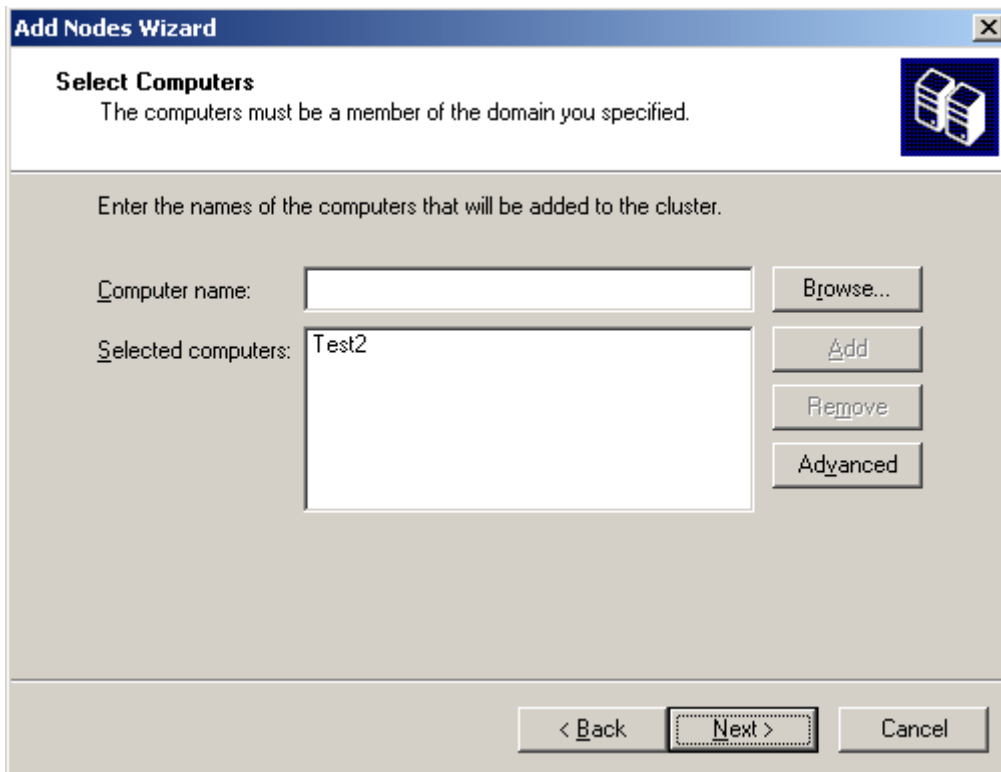
Press the **OK** to add this server to the cluster.

Welcome to the Add Nodes Wizard appears.



Press the **Next** button to continue.

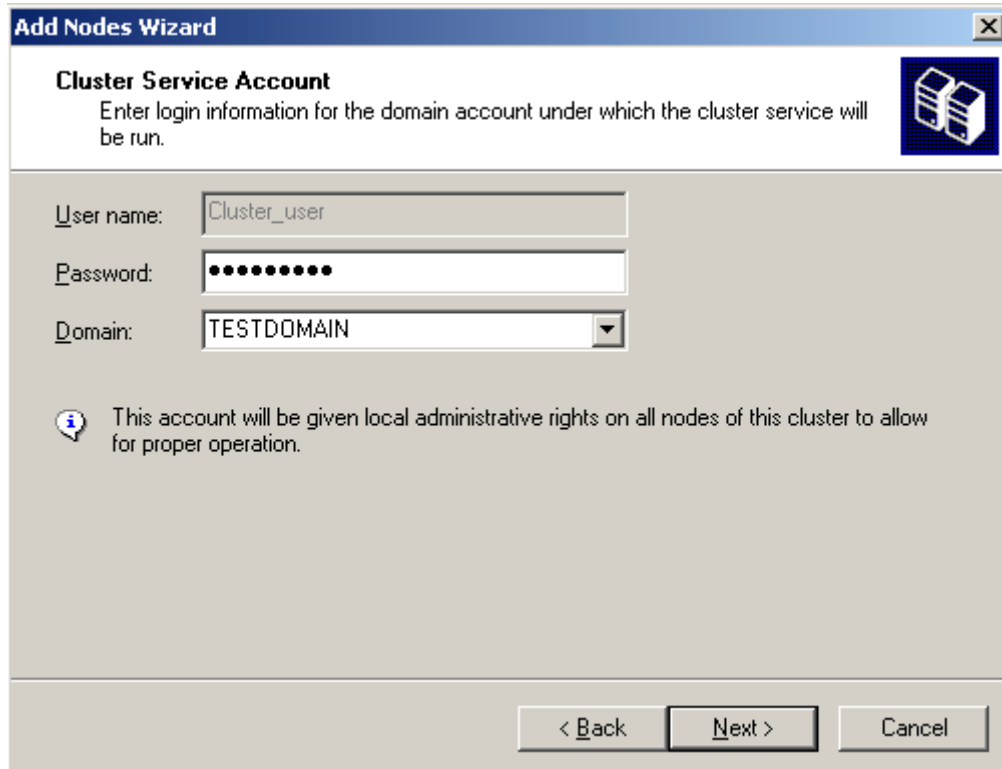
On the **Select Computers** page, press **Add** to add the server to the cluster.



Press the **Next** button to continue.

The wizard will start to analyze the configuration provided. If there are no errors, the **Next** button becomes enabled. If any errors occurred, review the detailed information and correct the errors before proceeding. Press **Next** to continue.

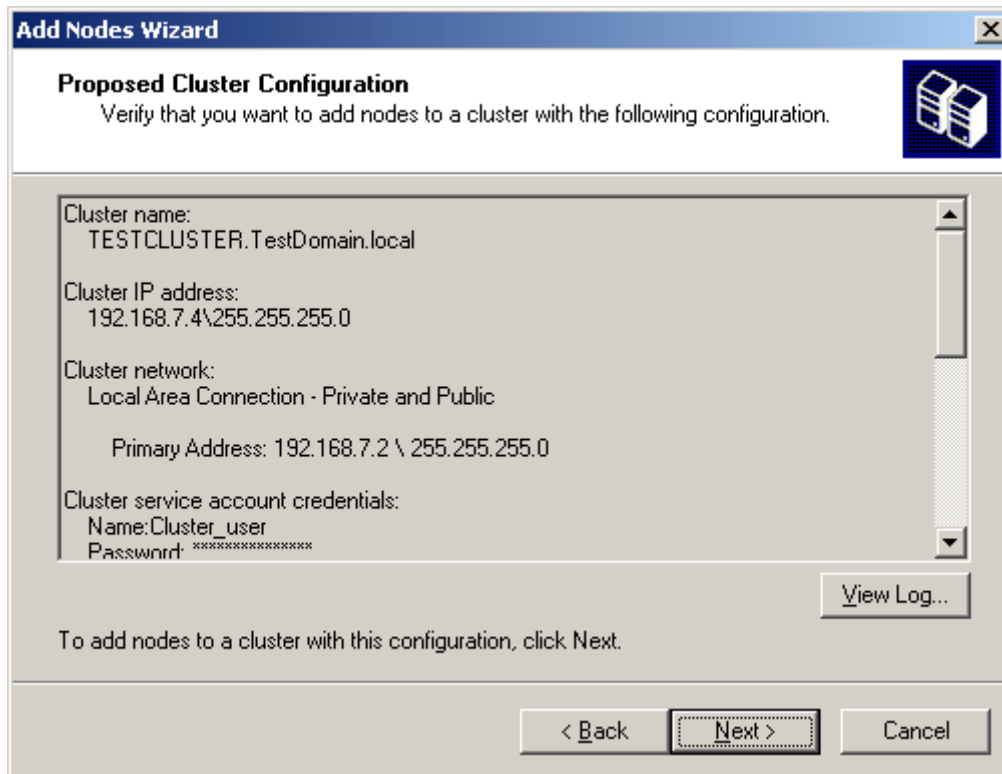
Enter the password for the user provided to run the cluster service.



The screenshot shows a Windows-style dialog box titled "Add Nodes Wizard". The main heading is "Cluster Service Account" with a sub-instruction: "Enter login information for the domain account under which the cluster service will be run." There is a small icon of a server rack to the right. Below this, there are three input fields: "User name:" with the text "Cluster_user", "Password:" with a masked field of ten dots, and "Domain:" with a dropdown menu showing "TESTDOMAIN". At the bottom left, there is an information icon and a note: "This account will be given local administrative rights on all nodes of this cluster to allow for proper operation." At the bottom right, there are three buttons: "< Back", "Next >", and "Cancel".

Press the **Next** button to continue.

The **Proposed Cluster Configuration** page appears.



Press the **Next** button to add this server to the cluster.

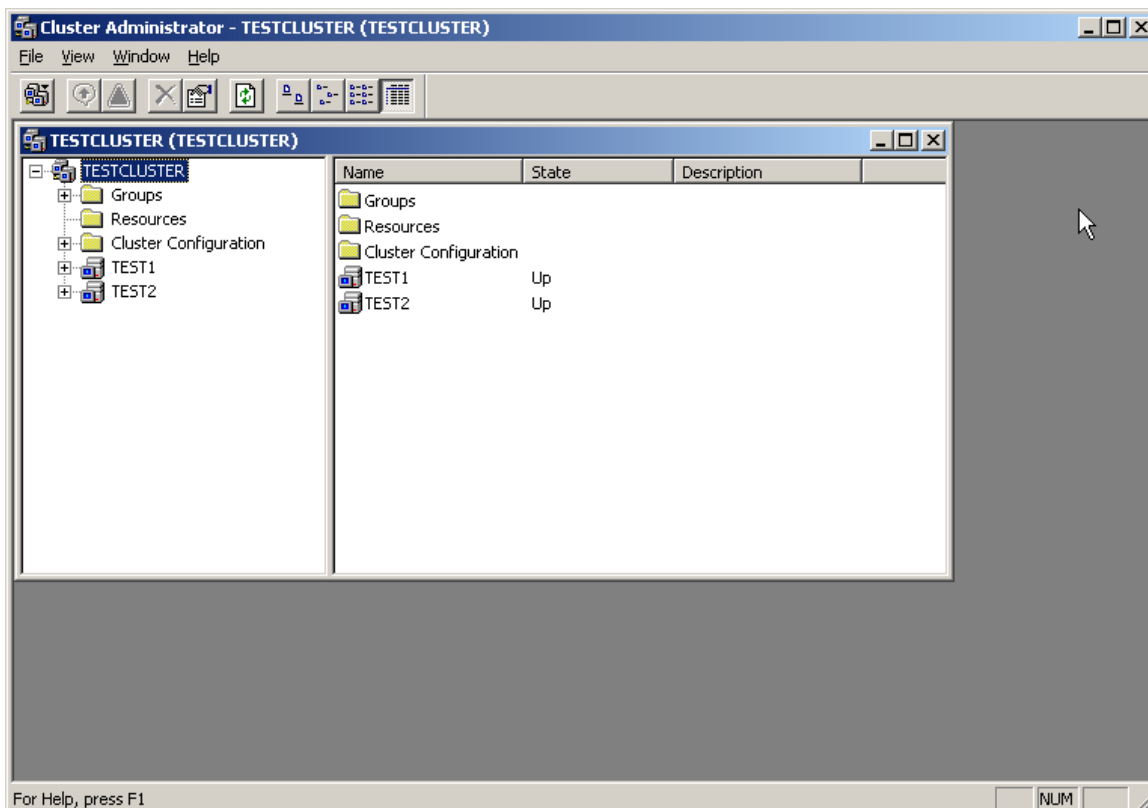
Completing the Add Nodes Wizard dialog appears.



Press **Finish** to complete the operation. The server is now a node in the cluster.

StarWind iSCSI Target for Microsoft Windows:

In result, a new node is added to a cluster.



StarWind iSCSI Target for Microsoft Windows:

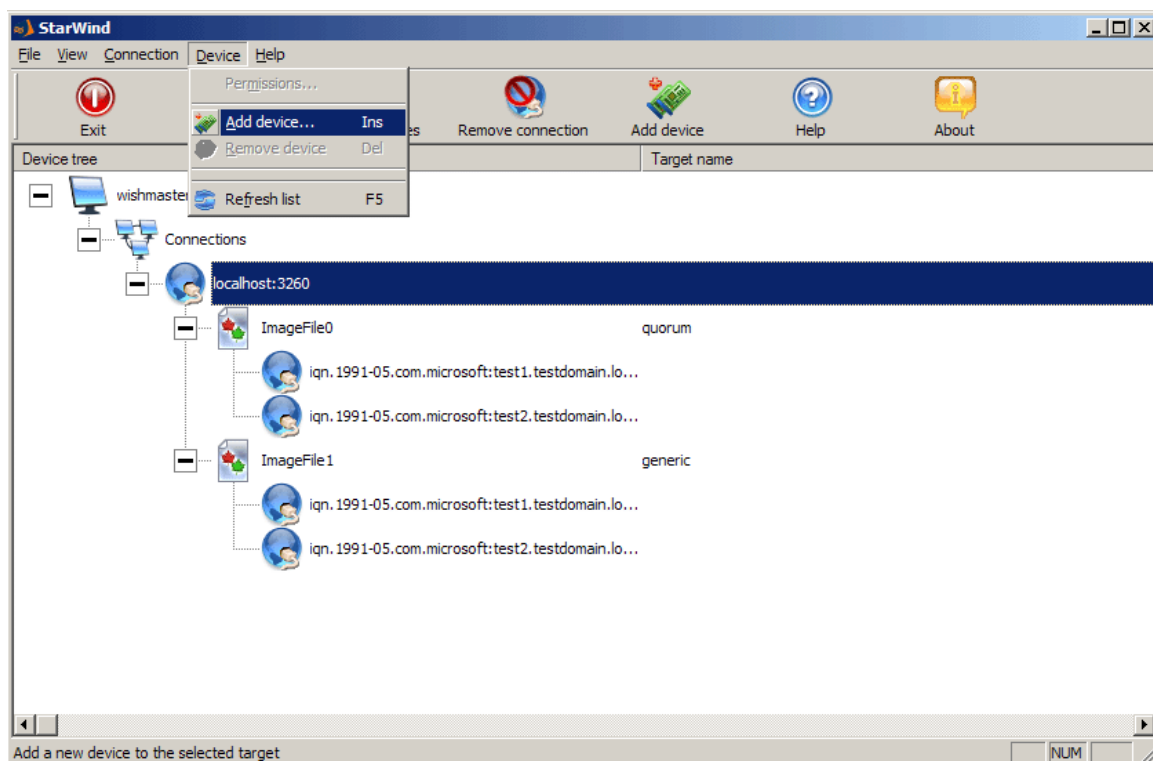
ADDING NEW SHARED DISK RESOURCE

Sometimes it becomes necessary to add additional disks to the cluster. Please follow the instructions below to do that.

Shut down all cluster nodes except one. Ensure that this node has full control over all the shared resources. Perform the operation described in **Exporting StarWind Disks, Configuring Initiators** and **Initialize iSCSI Devices** sections to export and initialize a **StarWind Disk** to the cluster nodes.

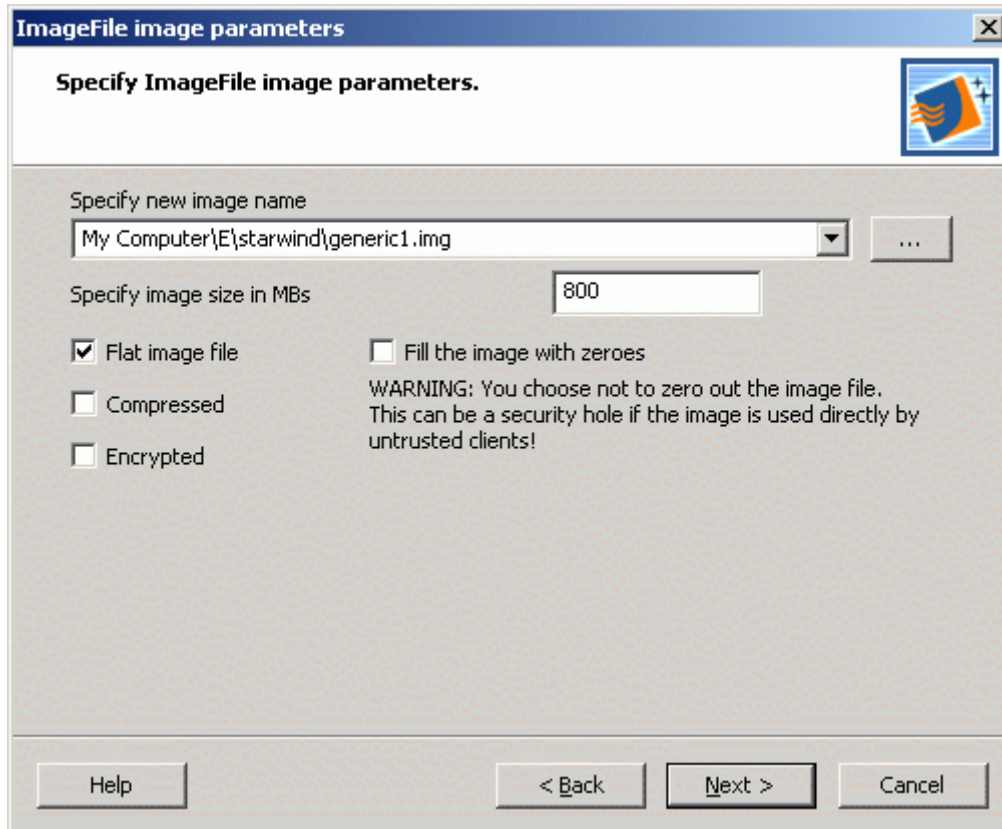
NOTE: Before converting a **StarWind** disk to a cluster disk, make sure that only one cluster server has access to the recently created **StarWind** disk at the same time. If more than one server has access to Failure to do so will lead to data corruption of the StarWind Disk.

Select the **Add device** item from the **Device** menu.



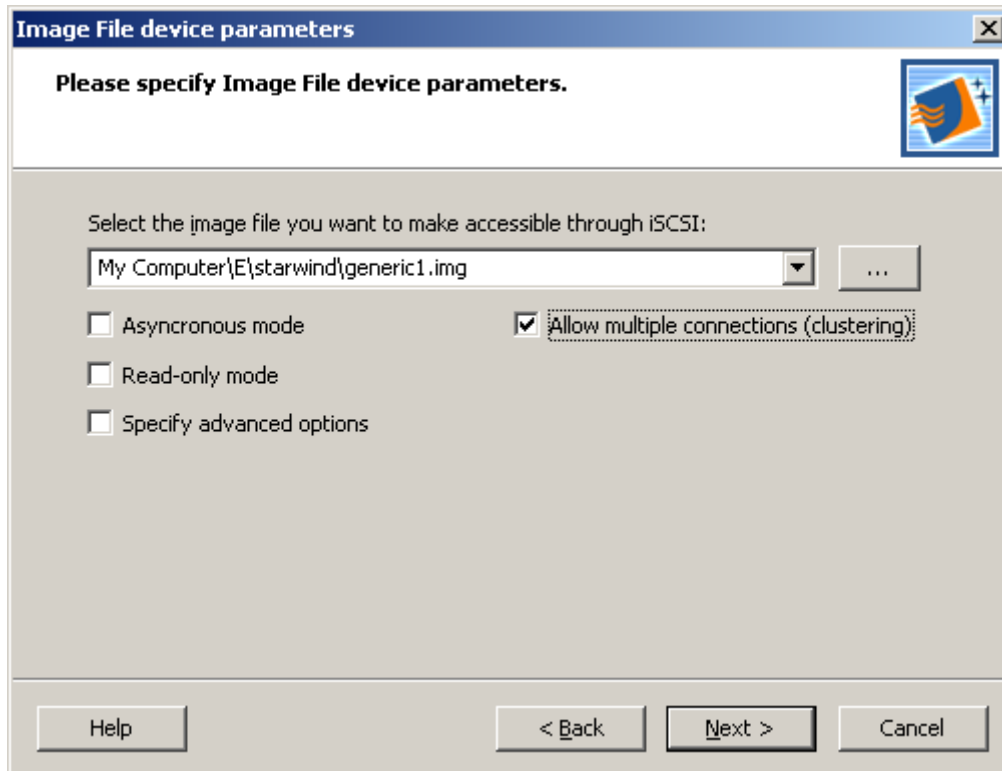
StarWind iSCSI Target for Microsoft Windows:

Specify the location and the name of the image you wish to be created. Also you have to provide the image size in megabytes. Check any additional parameters of the image you wish to create.



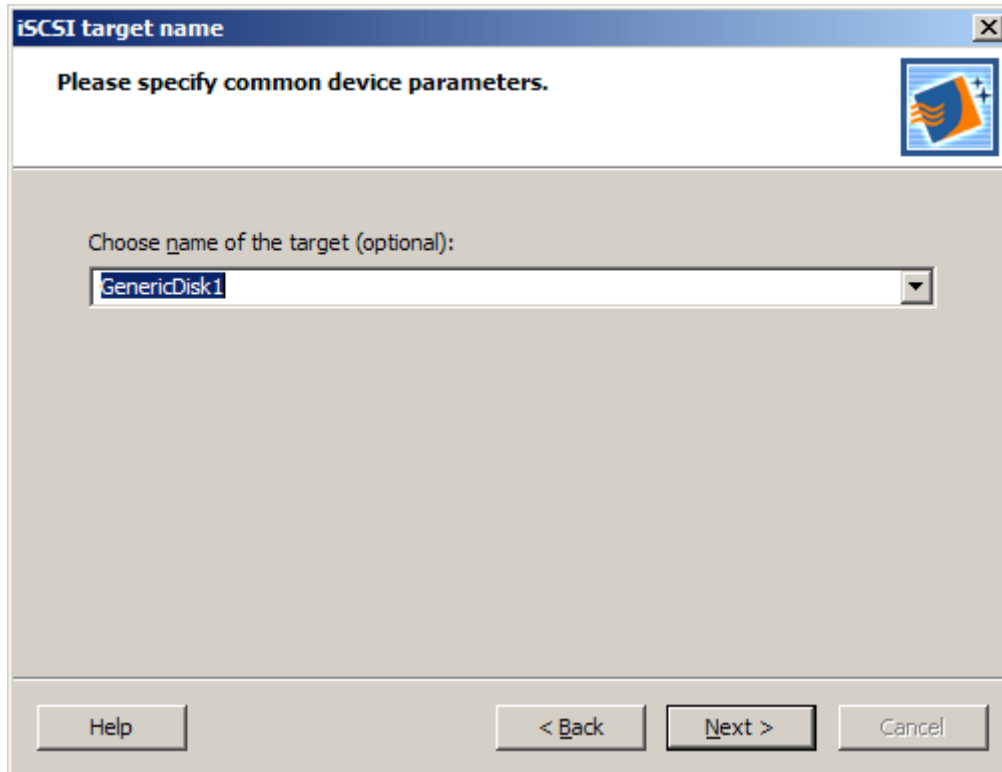
Press the **Next** button to continue.

Image file device has some extra parameters. Please refer to the online help for details regarding those additional parameters (**Asynchronous mode**, **Allow multiple connections (clustering)**, **Read-only mode** and **Specify advanced options**).



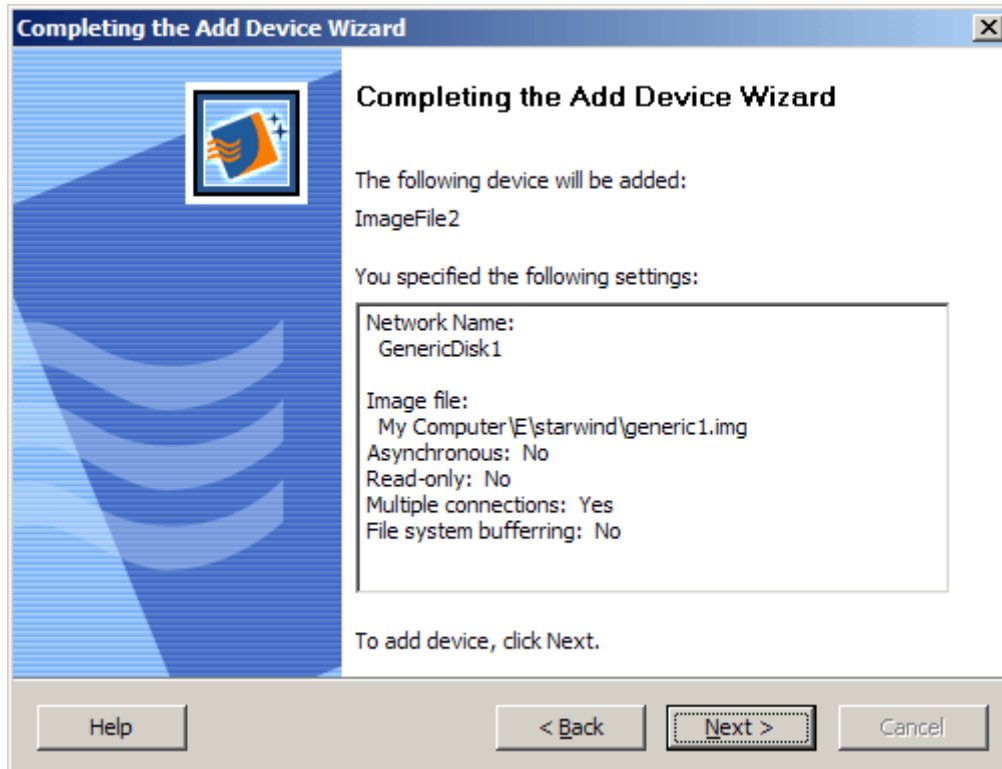
Press the **Next** button to continue.

Select an optional target name. Under this target name, the device will be declared to the iSCSI initiators connecting to the **StarWind** over an IP network.



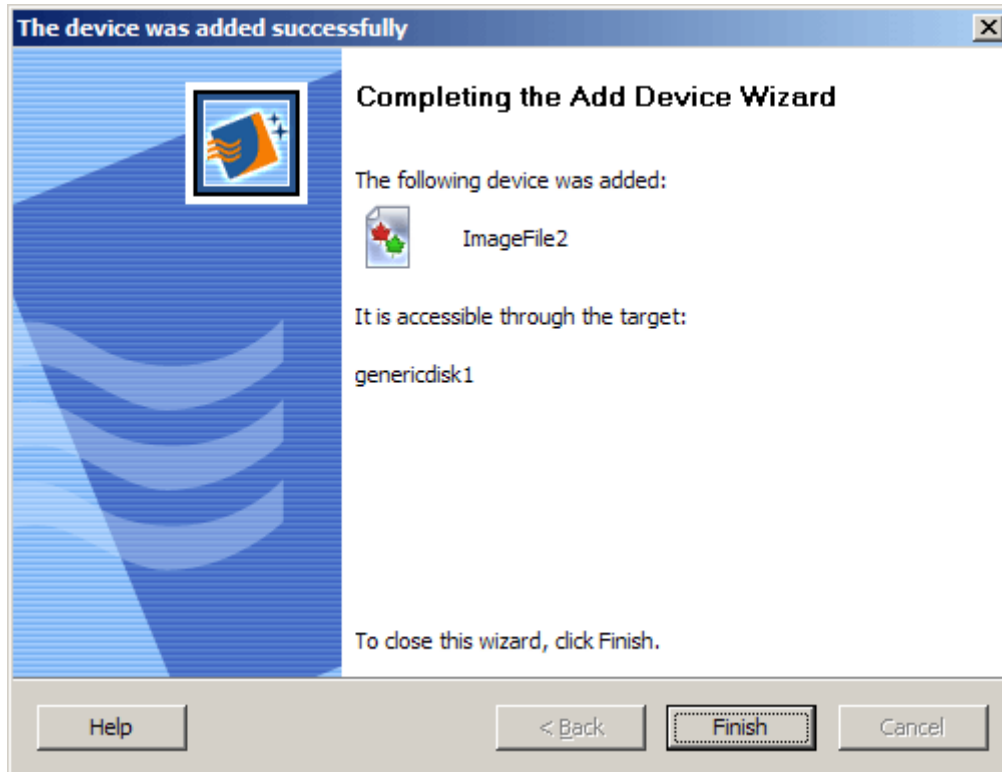
Press the **Next** button to continue.

Check if all of the device parameters are correct. Press the **Back** button if any changes are required.



Press the **Next** button to continue.

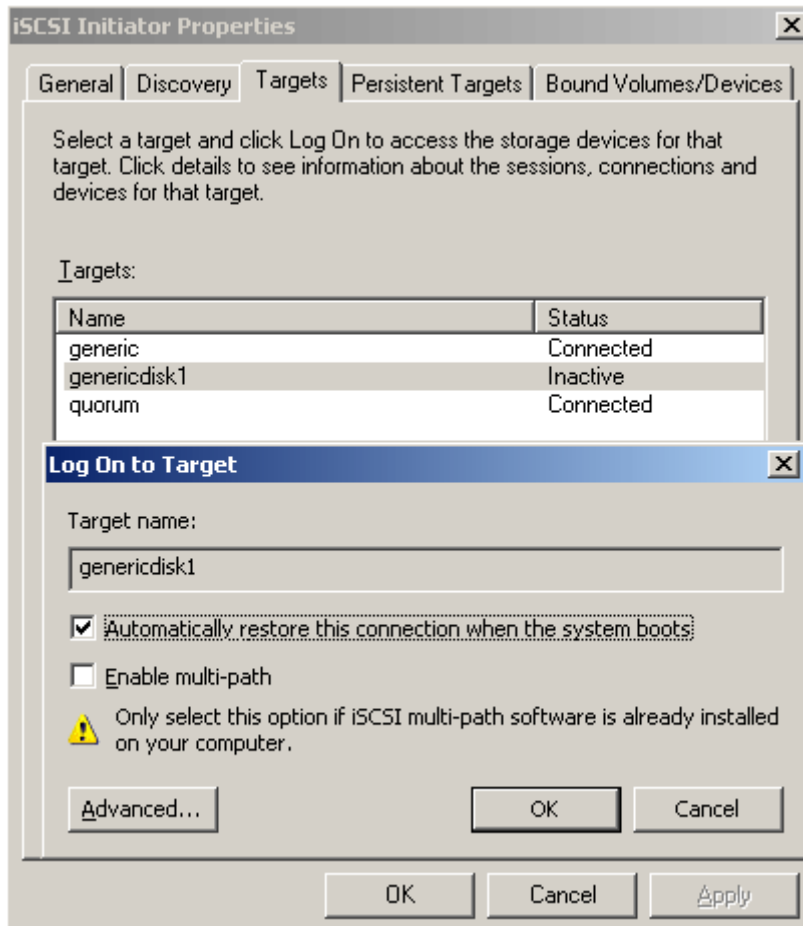
The information about the recently created device is displayed on the last wizard page (see image below).



Press the **Finish** button to close the wizard.

Log on to the cluster node 1 server using an account with administrative privileges.

Launch the **iSCSI initiator** and connect to the target.



StarWind iSCSI Target for Microsoft Windows:

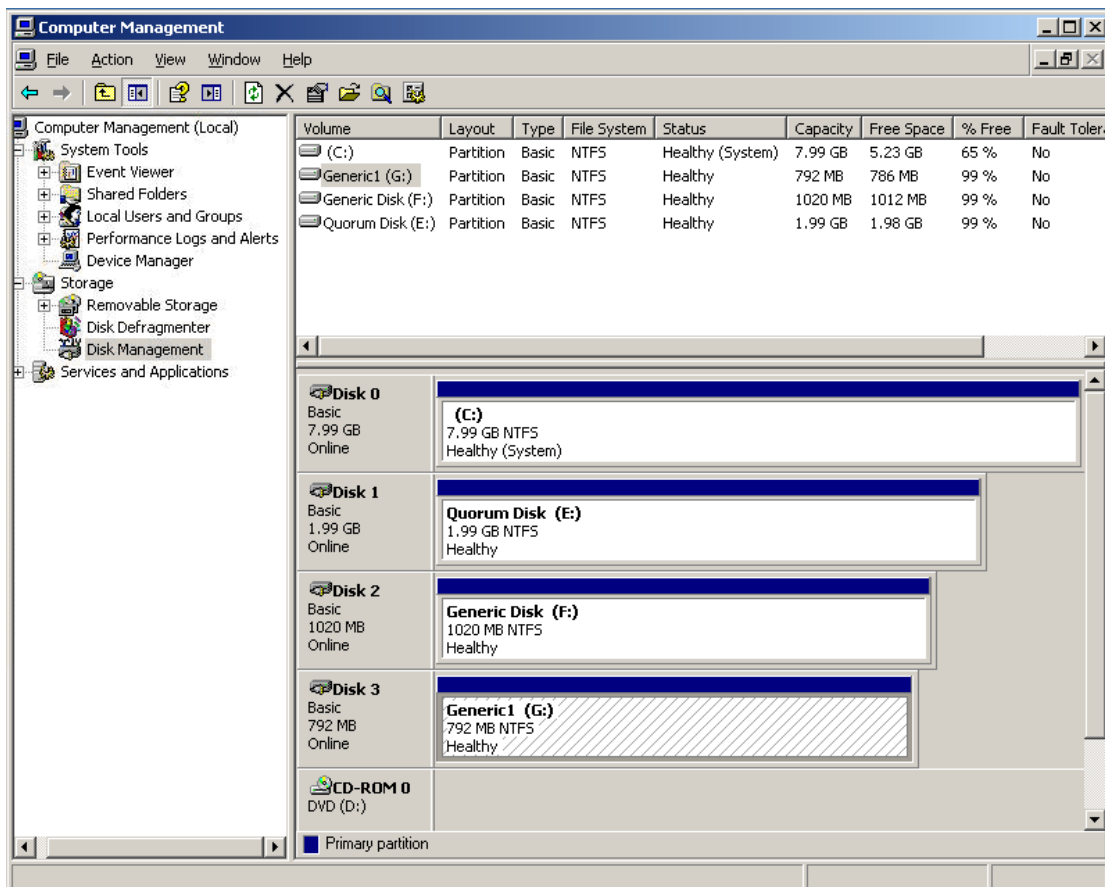
Log on to the cluster node 2 server using an account with administrative privileges.

Launch the **iSCSI initiator** and connect to the target.

Shut down the computer. Ensure that this computer is completely shut down before continuing.

Log on to the cluster **node 1** server using an account with administrative privileges.

Initialize the new volume, create and format the logical drive.



Shut down this server. When this server is completely shut down, restart the cluster **node 2** server.

StarWind iSCSI Target for Microsoft Windows:

Log in with administrative privileges.

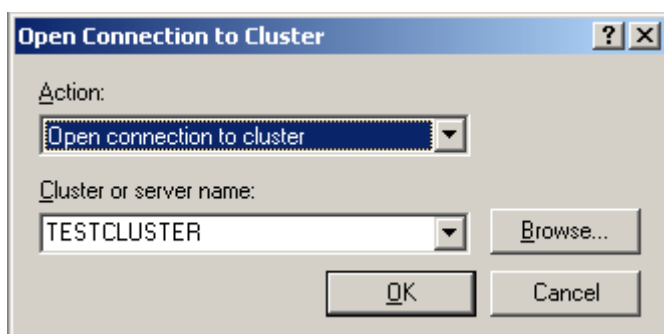
Launch **Computer Management** and select **Disk Management**. The disk that was formatted on the cluster **node 1** server should now appear without any drive letter mounted. Assign the same letter to this that was used when this drive was formatted.

Shut down the cluster node 2 server. When the cluster node 2 server is completely shut down, restart the cluster node 1 server.

CONVERT ISCSI DEVICE

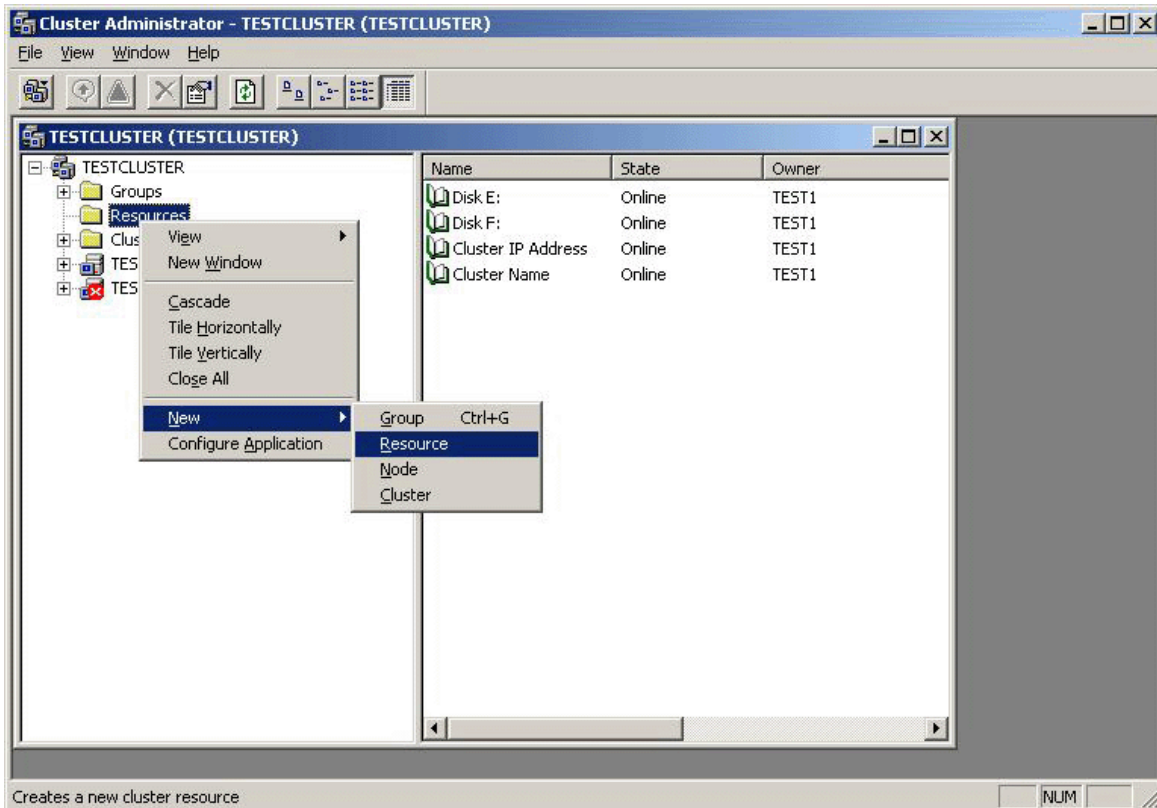
Log on to the active cluster node using an account with administrative privileges.

Launch the **Cluster Administrator** console and select Open connection to the cluster action.



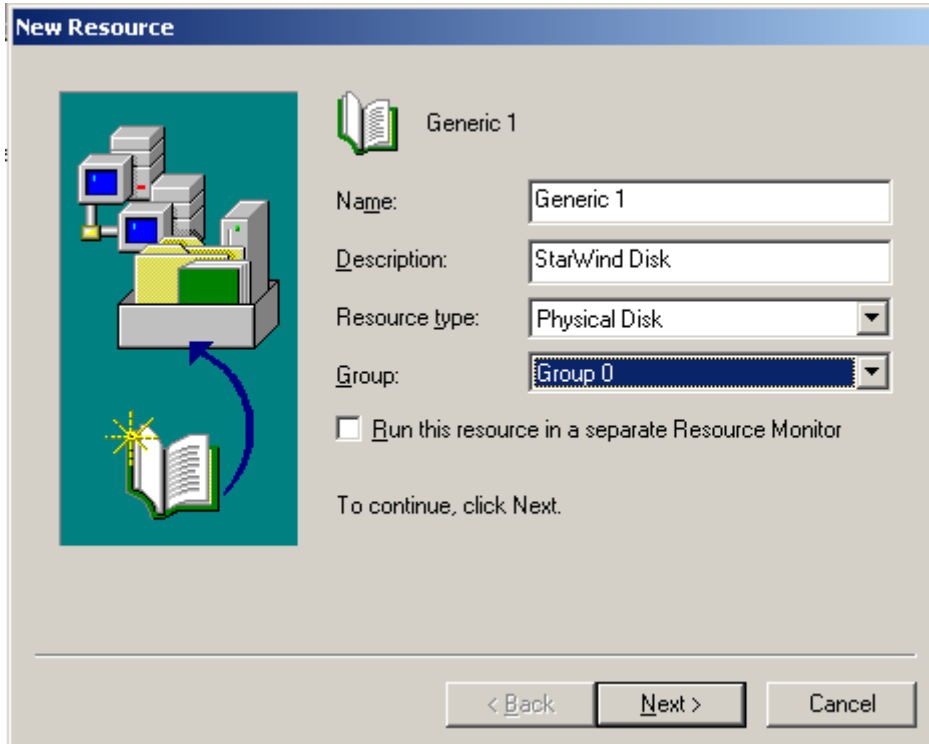
Press the **OK** button to continue.

Right-press on the **Resources** node and select **New | Resource**.



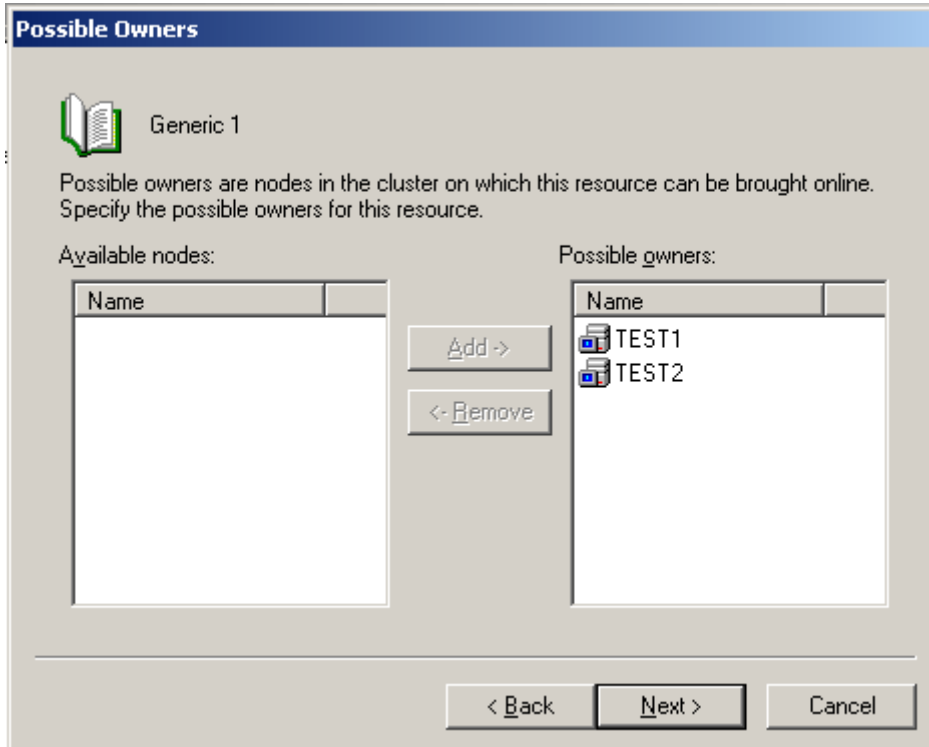
StarWind iSCSI Target for Microsoft Windows:

Specify a name for this new resource. For **Resource Type**, specify **Physical Disk** from the list. For **Group**, select the group to which this resource should belong.



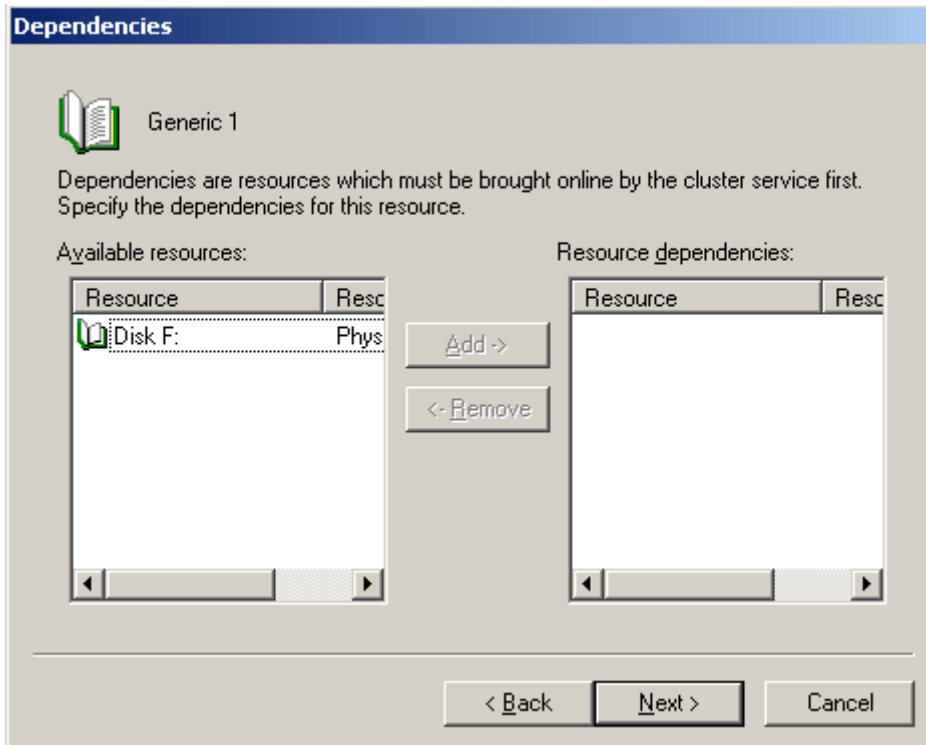
Press the **Next** button to continue.

On the **Possible Owners** page, specify all nodes in the cluster as the possible owners.



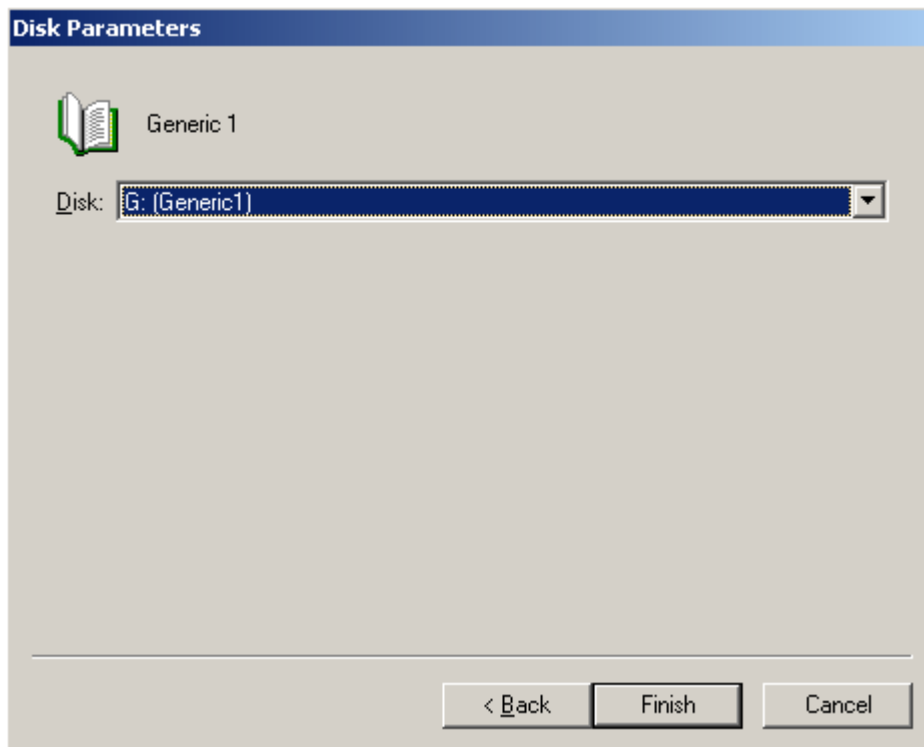
Press the **Next** button to continue.

The disk resource should not require any dependencies.



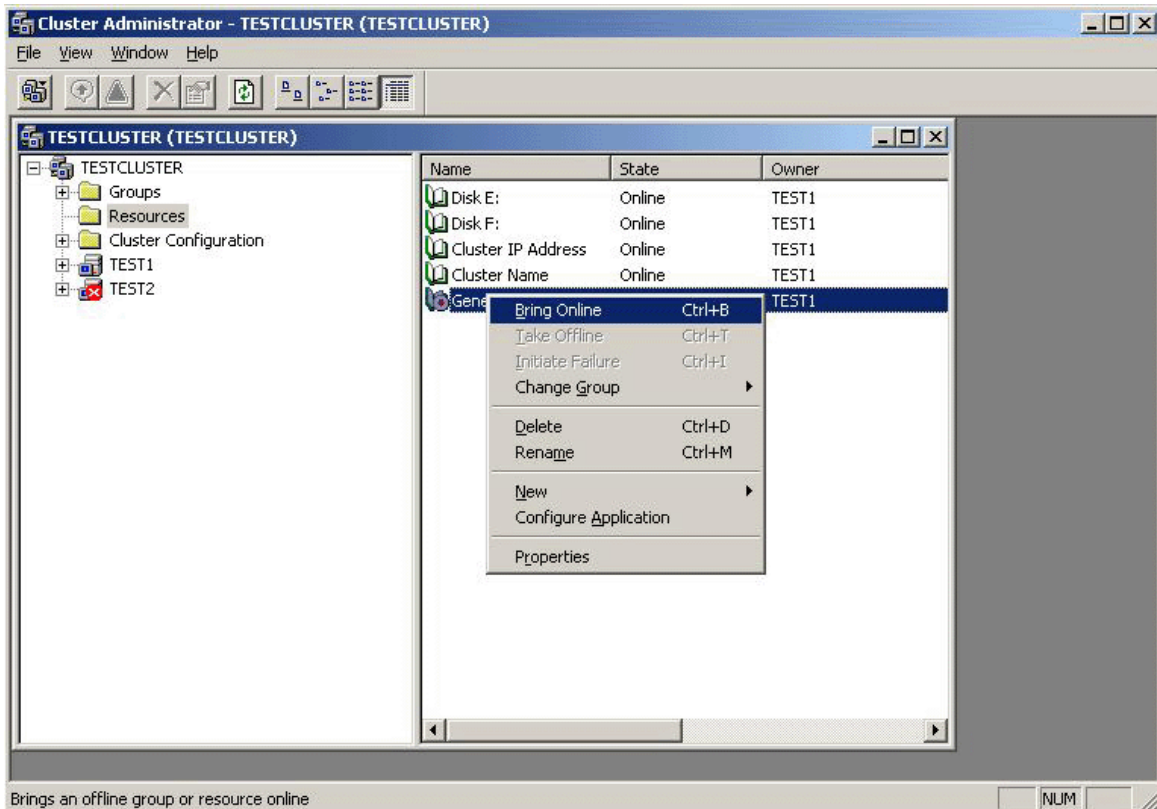
Press the **Next** button to continue.

Select the recently created partition from the list of disks.



Press the **Finish** to complete the operation.

The new resource should appear as offline in the details view of the Resource node. Right-press on the resource and select **Bring Online** from the context menu. When completed, the disk is now a cluster disk. Start the other servers in the cluster.



StarWind iSCSI Target for Microsoft Windows:

CONCLUSION

StarWind iSCSI Target for Microsoft Windows:

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