

Reference Implementation: Clustering VirtualCenter 2.5 Using Microsoft Cluster Services

Metadata

Title	Reference Implementation: Clustering VirtualCenter 2.5 Using Microsoft Cluster Services
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Author	<p>VMware (NYSE: VMW) is the global leader in virtualization solutions from the desktop to the data center. Customers of all sizes rely on VMware to reduce capital and operating expenses, ensure business continuity, strengthen security and go green. With 2007 revenues of \$1.33 billion, more than 120,000 customers and nearly 18,000 partners, VMware is one of the fastest-growing public software companies. VMware is headquartered in Palo Alto, California, and on the Web at .</p> <p>Revised document:</p> <p>Charu Chaubal</p> <p>charu@vmware.com</p> <p>Original document:</p> <p>Chris Skinner</p> <p>ccskinner@vmware.com</p>

Tags	availability clustering msocs virtualcenter high_availability
Location	Reference Implementation: Clustering VirtualCenter 2.5 Using Microsoft Cluster Services
Context	This paper documents the steps to successfully implement a high availability solution for VirtualCenter 2.5 using Microsoft's cluster services. There are some basic requirements to start the process. Microsoft requires Active Directory for cluster services. Additionally, Windows 2003 Enterprise server or higher will be necessary.
Actors	VMware Certified Professionals, VirtualCenter Management / Sysadmin / Operations / Backup Operators
References	Original document: Reference Implementation: Clustering VirtualCenter 2.5 Using Microsoft Cluster Services
Outline	<ol style="list-style-type: none"> 1. Deployment Assumptions 2. Preparing for Microsoft Cluster Services 3. Configuring Microsoft Cluster Services 4. Clustering VirtualCenter Services 5. Creating a VirtualCenter Cluster Group in MSCS 6. Additional Resources
Support	Please see this KB Article for information about support of this implementation. (TBD)

How to use this proven practice

This document goes over the steps to successfully implement a high availability solution for VirtualCenter 2.5 using Microsoft's cluster services. It shows the setup of a reference implementation, however, other variations would also be valid. This document will be updated as additional configurations and options are validated.

The instructions were written using VMs for the cluster nodes. However, most of the instructions would apply for physical cluster nodes. For further information on clustering see Additional Resources at the end of this document.

Contributors

- *Chris Skinner, VMware*: wrote the initial version of this document based on his own testing

What's Changed with VirtualCenter 2.5?

For readers who are familiar with the procedure used to set up VirtualCenter 2.0.1 with MSCS, this is how the procedure is changed with VirtualCenter 2.5:

- With the release of VirtualCenter 2.5, the database password is now stored in encoded form using the certificate. The challenge is that the certificate is generated separately for each VirtualCenter instance and so the encoded password would be different for each. It is necessary to reset the database password on the first node, copy it over to the second node and reset it there as well. Once that is complete, both nodes will have the same encoded password in their respective certificates and the failover should be seamless.

Deployment Assumptions

This document assumes the following:

- Using VirtualCenter 2.5
- Cluster nodes run Windows 2003 R2 Enterprise server
- Active Directory is properly working with the cluster nodes
- The cluster environment has 2 private IP addresses for node to node communications and 4 Public IP addresses, one for each node, one for the cluster and one for VirtualCenter.
- The VirtualCenter IP address should be able to communicate with your ESX hosts.
- No other VMware product, such as VMware Update Manager or VMware Converter Enterprise, will be installed on the VirtualCenter Server nodes. These products can be installed on separate servers or VMs, and it is recommended that this be done when clustering VirtualCenter
- The Guided Consolidation (Consolidate) feature built into VirtualCenter 2.5 is not being used. The instructions don't provide for failing over and restoring of this functionality, so it is recommended that it not be used on any VirtualCenter instance that you wish to cluster

Cluster Prerequisites

The instructions below assume that a cluster is already configured with the following properties:

- Two cluster nodes (referred to in the instructions as VCNodeA and VCNodeB)
- Public and private network connecting the nodes
- Quorum disk

Please make sure that basic cluster functionality is working before proceeding with the rest of this document.

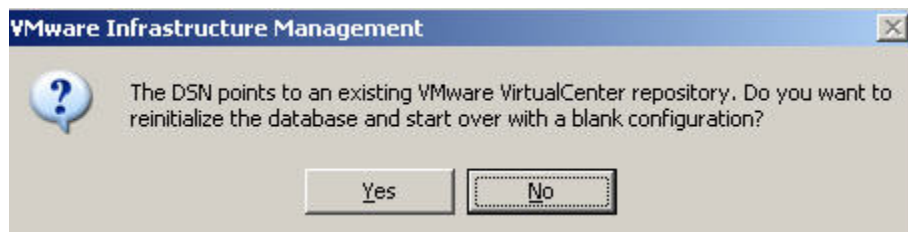
Clustering VirtualCenter Services

Although VirtualCenter is not a "cluster aware" application, its supporting services can be set up in an active-passive configuration. The first section starts this configuration assuming VirtualCenter is installed into the first node, VCNodeA, and is using a SQL server database on a separate server. Of course, SQL Server is a "cluster aware" application and can be setup to be clustered as well.

- Verify that VirtualCenter works by logging in VI client. Once that's complete, stop the VirtualCenter service and the License server service in VCNodeA.

Start > All Programs > Administrative Tools > Services

- Install VirtualCenter into VCNodeB using the same ODBC connector, database and license file. When prompted to reinitialize the existing VirtualCenter repository, click **No**.



- Click **Ok** twice to accept the notifications. Next, browse to the license file and click **Next** three times.
- Click **Install** to begin.
- Once the install is complete and the services have been verified, stop the VirtualCenter service and License server as before.
- Go back to VCNodeA and start the VirtualCenter service and License service.

Copying the Certificates for VirtualCenter

In order to successfully failover in a cluster configuration, both nodes in the VirtualCenter cluster have to have identical certificates. This will not cause a conflict since VirtualCenter does not permit two VirtualCenter instances to simultaneously access the same database. They do, however, have to present the same credentials to the database. With the release of VirtualCenter 2.5, the database password is now stored in encoded form using the certificate. The challenge is that the certificate is generated for each VirtualCenter instance. It will be necessary to reset the database password on the first node, copy it over to the second node and reset it there as well. Once that is complete, both nodes will have the same encoded password in their respective certificates and the failover should be seamless.

- Once the services have been restarted on VCNodeA, open a command prompt and navigate to:
C:\Program Files\VMware\Infrastructure\VirtualCenter Server
- Execute, vpxd.exe -p to reset the database password to whatever you want.
- Stop the VirtualCenter service again on VCNodeA.
- On VCNodeA, navigate to:
C:\Documents and Settings\All Users\Application Data\VMware\VMware VirtualCenter\SSL
- Copy the certificates in this directory over to VCNodeB replacing that node's certificate

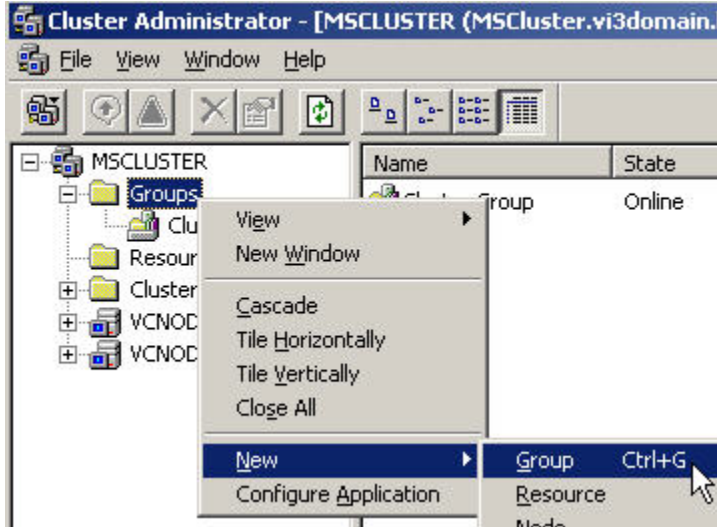
Note: *It might be a good idea to rename VCNodeB's certificates first in case they need to be referred back.*

- On VCNodeB, perform steps 1-2 using the same password as VCNodeA.
- Start the VirtualCenter service and make sure VI client can connect.
- Stop the VirtualCenter service on VCNodeB and restart VCNodeA's.

Creating a VirtualCenter Cluster Group in MSCS

Although cluster services previously implemented, that was to establish the nodes involved and identify an owner of the cluster services. It is now necessary to create a new cluster group to specifically manage clustering for VirtualCenter and supporting services separately.

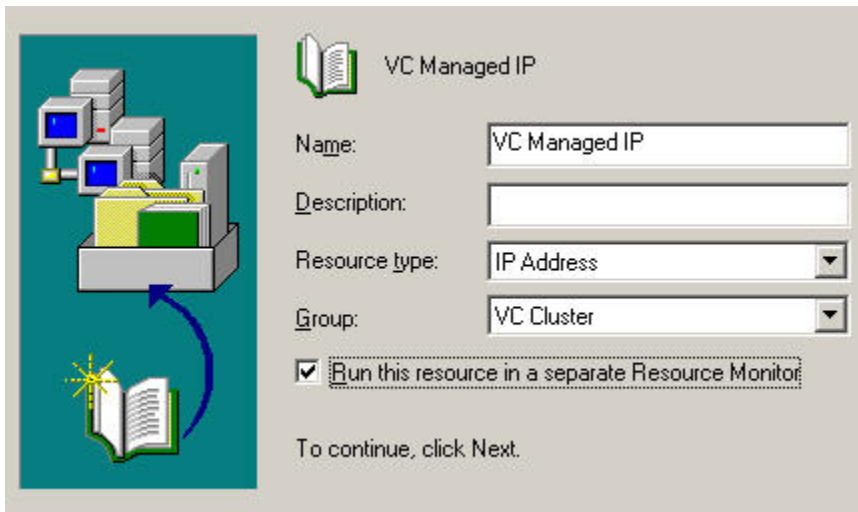
- Start the Cluster Administrator on VCNodeA.
- Right-click **Groups** and select **New > Group**.



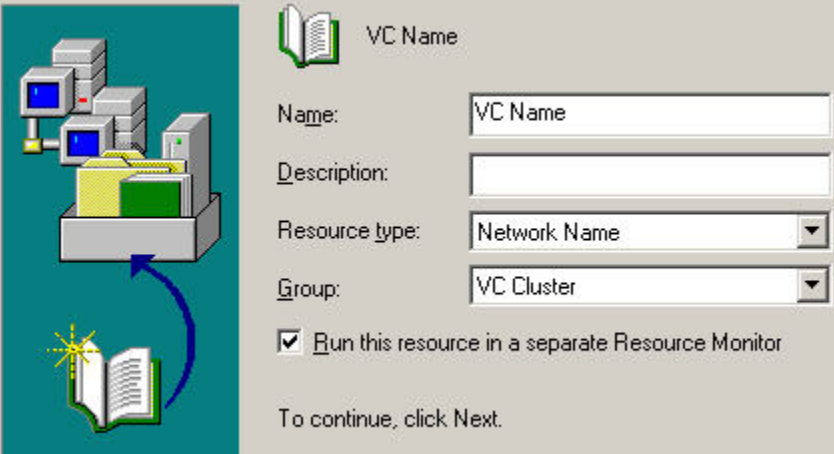
- Enter a name and/or description for the VirtualCenter cluster and click **Next**.
- Click **Finish** *without* adding any owners. Click **Ok**.
- Select the newly created cluster group, then right-click and choose **New > Resource**.
- The first step is create a single, managed IP address to be used for accessing the VirtualCenter cluster.

Note: Make sure that the IP address being assigned has a Host (A) record in the DNS zone.

Enter a name and choose **IP Address** from the drop-down list. Check the box, **Run this resource in a separate Resource Monitor**. Click **Next** three times.



- Now enter the IP address to be used for managing access to the VirtualCenter cluster. Pick the appropriate IP address for your VirtualCenter Server (public facing) network and click **Finish**. Click **Ok**.
- Create another resource per step 5. The **Resource Type** should be **Network Name**. Click **Next** twice.



VC Name

Name: VC Name

Description:

Resource type: Network Name

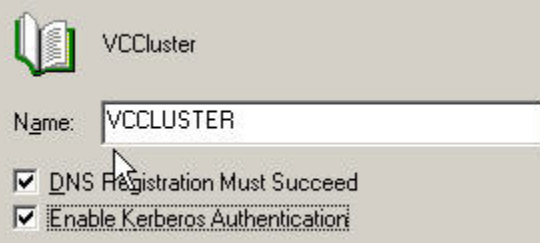
Group: VC Cluster

Run this resource in a separate Resource Monitor

To continue, click Next.

In the **Dependencies** screen, add the **VC Managed IP** resource as a dependency. Select the box **Run this resource in a separate Resource Monitor**. Click **Next** three times.

- Enter the name defined for the Host (A) record in step 6. Check both boxes and click **Finish** and **Ok**.



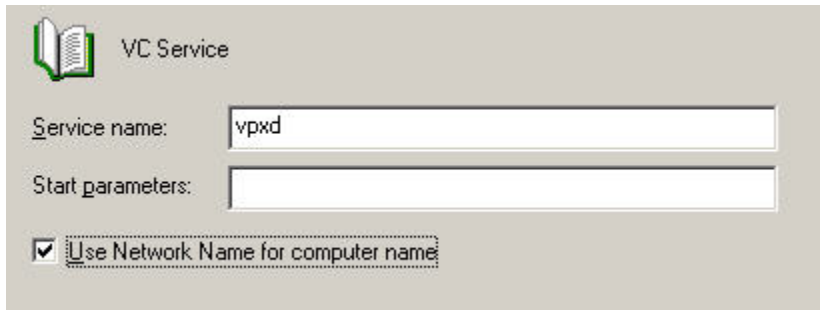
VCCluster

Name: VCCLUSTER

DNS Registration Must Succeed

Enable Kerberos Authentication

- Create another resource for the VirtualCenter service. Choose **Generic Service**, check the box and click **Next** twice.
- Add the VC Name as its dependency. Enter vpxd as the **Service Name** and check **Use Network Name from computer name**. Click **Next** and **Finish** and then **Ok**.



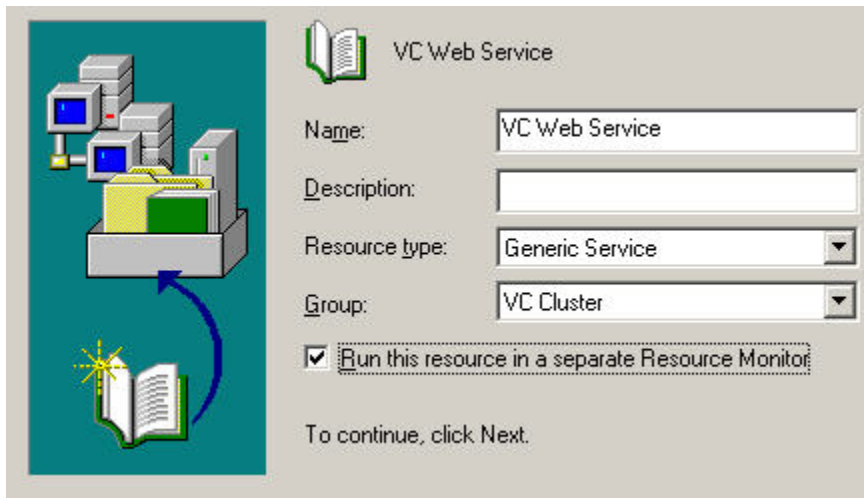
VC Service

Service name: vpxd

Start parameters:

Use Network Name for computer name

- Create a resource for the web service. Choose **Generic Service**, check the box and click **Next** twice.



VC Web Service

Name: VC Web Service

Description:

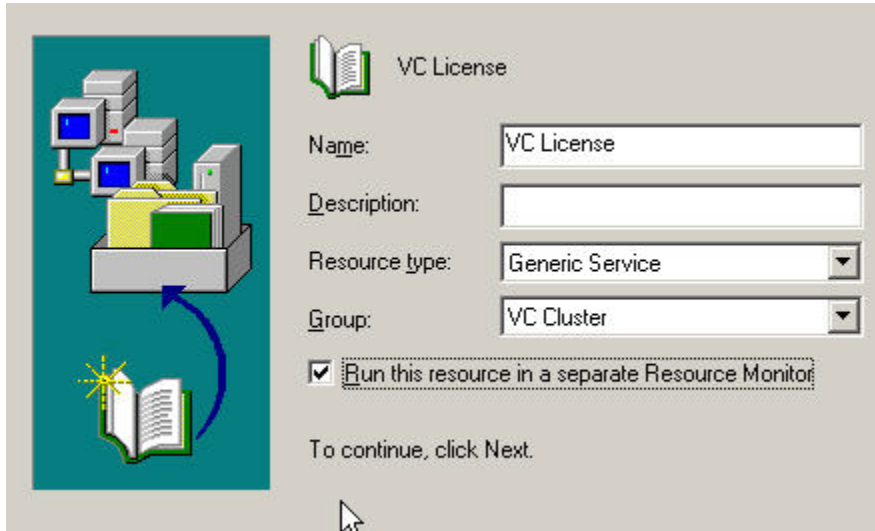
Resource type: Generic Service

Group: VC Cluster

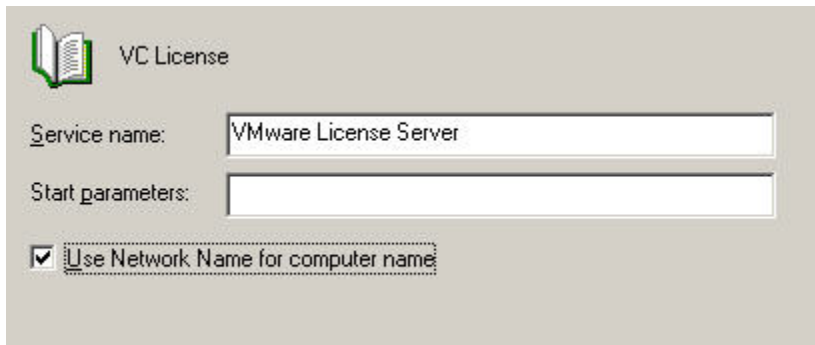
Run this resource in a separate Resource Monitor

To continue, click Next.

- Add the VC Service as its dependency. Enter webAccess as the **Service Name** and check **Use Network Name from computer name**. Click **Next** and **Finish** and then **Ok**.
- Create the last resource for the license service. Choose **Generic Service**, check the box and click **Next** twice.



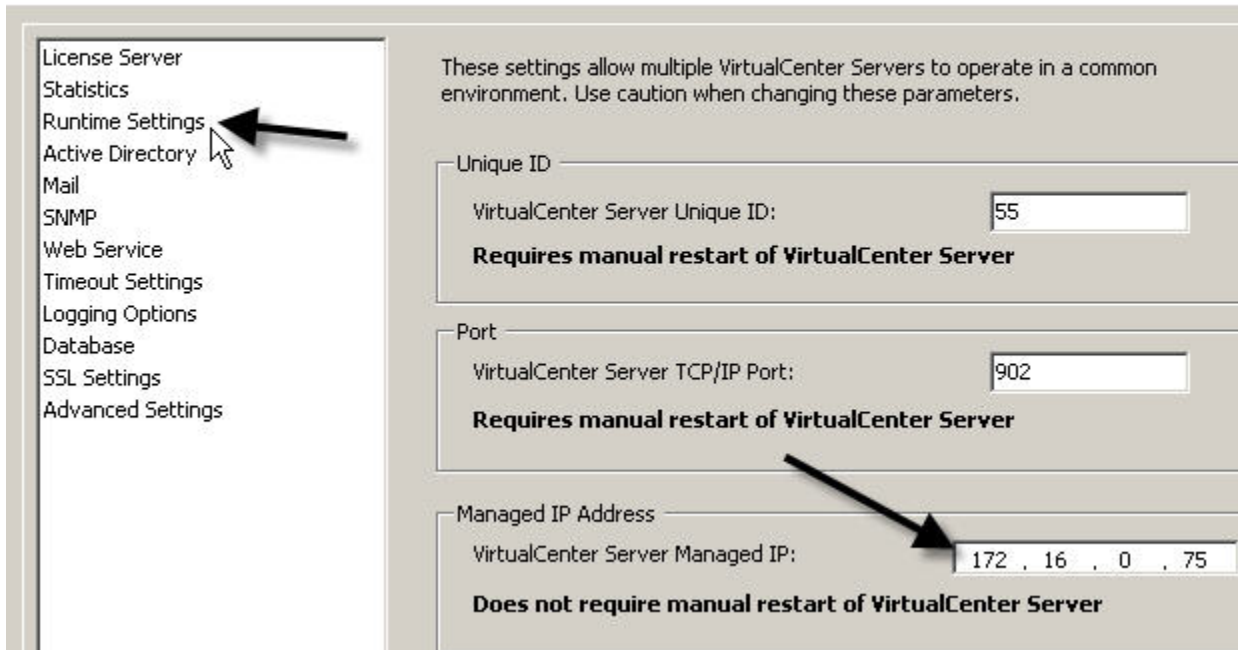
- Add the VC Service as its dependency. Enter VMware License Server as the **Service Name** and check **Use Network Name from computer name**. Click **Next** and **Finish** and then **Ok**.



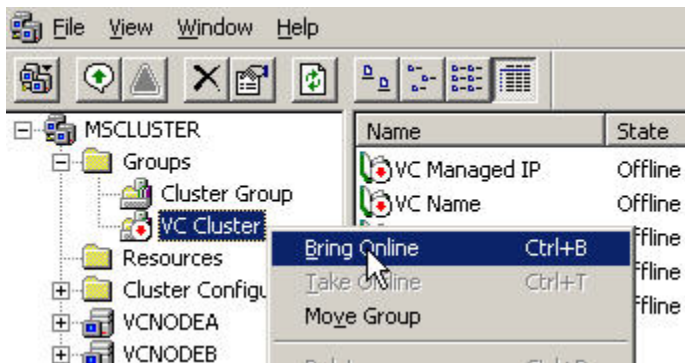
- That will complete the cluster group for the VirtualCenter server and its supporting services.
- Lastly, launch the VI client, log into VCNodeA, and enter the managed IP address defined for the VirtualCenter cluster. Click **Administration > VirtualCenter Management Server Configuration...** from the menu. Select **Runtime Settings** and enter managed IP address defined in step 7. Click **Ok**.

Select VirtualCenter Runtime Settings

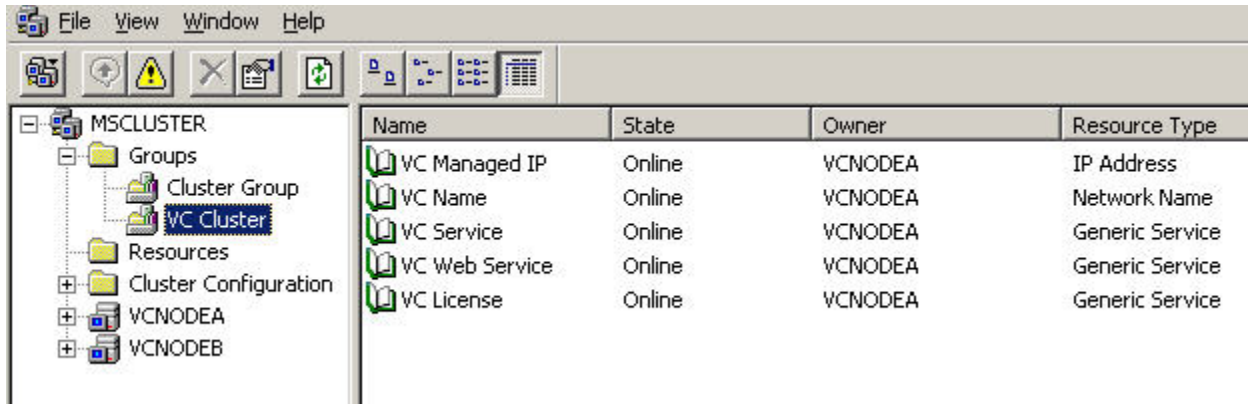
What are the unique runtime settings for this VirtualCenter installation?



1. Back in the Cluster Administrator application, bring the VC cluster online. Right-click the **VC Clustergroup** and choose **Bring Online**.



- At this point, the cluster should be online and running.



- To test the VirtualCenter cluster, right-click the **VC Cluster** and choose **Move Group**. This should take the VCNodeA offline and bring the VCNodeB online.



- Log into VirtualCenter with VI client using the managed DNS/IP address defined for the cluster and register the ESX hosts.

Additional Resources

The following are additional links to some documents that can provide additional information and alternatives, such as physical-to-virtual and cluster-across-box configurations. Additionally, there are some links to VMware whitepapers which provided some of the inspiration for this project.

- *Using MSCS to Cluster VirtualCenter (VirtualCenter 2.0.1 Patch 2)*
http://www.vmware.com/pdf/VC_MSCS.pdf
- *Guide to Creating and Configuring a Server Cluster under Windows 2003* [

<http://www.microsoft.com/downloads/details.aspx?familyid=96F76ED7-9634-4300-9159-89638F4B4EF7&displaylang=en>]

- [Technical Overview of Windows Server 2003 Clustering Services \[http://www.microsoft.com/windowsserver2003/techinfo/overview/clustering.mspx \]](http://www.microsoft.com/windowsserver2003/techinfo/overview/clustering.mspx)

For guidance on clustering vCenter Server 4.0 using MSCS, please refer to the following document:

- [Reference Implementation: Clustering vCenter Server 4.0 Using Microsoft Cluster Services](#)