Setting Up A Windows Server 2003 Cluster in VS2005 - Part II

The intent of this post is to pickup where I left off in explaining how you, armed with Virtual Server 2005, can create your own <u>Microsoft</u> Cluster Services cluster for test or development work. What was once possible for only the rich (and those with some shared SCSI storage and two servers sitting around idle) is now within the grasp of all who wish to "geek out".

Before you get started, you should read Part I if you haven't - http://www.roudybob.net/?p=118.

You must understand - I am not intending to cover every part of clustering with Windows Server 2003. It's a much too broad and complex topic to address in one post. My intent here is to provide a step-by-step process for getting a basic MSCS clustering running within Virtual Server 2005. Beyond this, I reccomend you try looking <u>here</u> or <u>here</u>. Having said that, I'll try to answer to the best of my ability any questions left in the comments section of this article. If it takes a long time respond, I apologize in advance. If you don't get a response, it's probably because I don't know the answer.

This is a 300-level article. I'm assuming you know quite a bit about Virtual Server and Windows Server 2003 Clustering Service. The following might help answer any questions or give you some more information to get you started:

Technical Overview of Clustering Services (Microsoft) - <u>http://www.microsoft.com/windowsserver2003/techinfo/overview/clustering.mspx</u>

Clustering Services in Windows Server 2003 (Microsoft) - <u>http://www.microsoft.com/technet/prodtechnol/windowsserver2003/technologies/clustering/defa</u><u>ult.mspx</u>

Virtual Server 2005 Glossary (Bob Roudebush) http://www.roudybob.net/?p=90

What Hardware Does Virtual Server 2005 Emulate (Bob Roudebush) - <u>http://www.roudybob.net/?p=91</u>

If you successfully made it through Part I, you should now have two virtual machines - NODE1 and NODE2. Each should have a SCSI adapter configured (and shared) and be pointed to a shared virtual disk. Now it's time to install Windows Server 2003 on both nodes and configure the MSCS.

You Should Already Have the Following In Place

• A machine (physical or virtual) running Windows Server 2003 or Windows Server 2000 and acting as a domain controller.

Configuring NODE1

- Either using a physical CD for Windows Server 2003 or an ISO image of the installation CD, boot NODE1 and install Windows Server 2003.
- For purposes of this demonstration, a default install will work with one exception. You'll need to configure the two network cards in the machine with static addresses.

- One needs to have a "public" static address (on the same IP subnet that your clients will use) and the other is only used for "heartbeat" or "private" communication and will have an address on a different IP subnet.
- In <u>Part I</u>, you configured Virtual Server with two virtual machines each one had two virtual network cards configured. One was connected to the virtual network "Internal". The other was connected to the virtual network "External".
- You need to figure out which network card is which within Windows this is trickier than you might think. Within Windows, each card will have the same hardware manufacturer and model number since Virtual Server 2005 emulates the same netework card hardware. The easiest way to do this is to disconnect the "External" card by using the Virtual Server Administration Website. To do this, go to the website, find the virtual machine, and go into "Edit Configuration". Click "Network Adapters" and then disable the virtual network card connected to "External Network". In Windows, the network card that is showing up as "Disconnected" is the external card - the other is the internal card!
- Once you've done this, the rest is easy. Within Windows Server 2003, rename the network connection connected to the "External Network" to "Public". Rename the other network connection to "Private". This will help you keep them straight.
- Configure the "Public" connection with an IP address that's valid on your host's LAN. Configure the "Private" connection with an IP address that's NOT THE SAME as your host's LAN. Also, on the "Private" connection, DO NOT configure a default gateway.
- DO NOT power up NODE2 until instructed to do so later. If both machines see the "shared" disk before the cluster is configured it could cause corruption issues on the quorum disk.

Configuring the Quorum Disk

- Once Windows Server 2003 is installed and functioning on NODE1, you will need to configure the shared disk or the "Quorum Disk".
- To do this, start the Disk Management tool from the Computer Management MMC (Right click "My Computer", select "Manage...").
- Next, you should see the shared disk show up as "Disk 1". Right-click on the unallocated space (should be 16.00GB) and select "New Partition".

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| 🗉 🙀 Performance Logs and Alerts | | | | | | | | |
| Device Manager | | | | | | | | |
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| Disk Defragmenter | | | | | | | | |
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• Using the wizard, accept the default selections for Partition Type and Partition Size. For drive letter, I usually select "Q:" just because it makes sense. This is the "Quorum" disk after all. Finish going through the wizard, selecting "Perform Quick Format" when asked to format the drive. You should now have a drive C: and a drive Q:

Setting Up The Clustering Service - Adding the First Node

- Start the Cluster Administrator MMC on NODE1. "Start", then "All Programs", then "Administrative Tools" and, finally, "Cluster Administrator". Notice that the cluster functionality is installed by default on Windows Server 2003. In Windows Server 2000, you had to add this component after the default installation of the OS.
- The "Open Connection To Cluster" box should open by default. Select "Create new cluster". Click OK.

| 🔋 NODE1 on stewart20 - Virtual Machine Remote Control | |
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| Remote Control | |
| Open Connection to Cluster Action: Coste new cluster Uster or server name: Uster or server name: UK Cancel | |
| For Help, press F1 | |
| | Recycle Bin |
| 🔰 Start 🛛 🞯 🧔 🖉 Cluster Administrator | 🛃 🛃 5:24 PM |

• Click "Next" at the Cluster Wizard welcome screen.

• On the "Cluster Name and Domain" screen, select the appropriate AD Domain and then give your cluster a name. This is the Virtual Name for the cluster - it will be used by clients to locate whatever clustered services will be available from the network. Click "Next".

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| | |
| Elister Administrator New Server Cluster Wizard | |
| Cluster Name and Domain Specify the name of the new server cluster and the domain in which it will be created. | |
| Select or type the name of the domain in which the cluster will be created. Only computers in this domain can be members of the cluster. | |
| Domain: msbob.net.local | |
| Type a cluster name that is unique in the domain. This must be a valid computer name. | |
| Cluster name: | |
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| Start 🔯 🧑 🛱 Cluster Administrator | 📑 📑 5:25 P |

- On the "Select Computer" screen, enter the name (or browse) to the first node in the cluster. In this case, that would be the machine you're working on NODE1. Click "Next".
- The Cluster Administrator will now perform a preliminary analysis of the configuration. If it was successful, click "Next" when it is finished. If it was not successful, look at the details from the log and correct any issues.
- Enter the IP address you want to assign to the "Public" interface for the cluster the one clients will use to access resources. Click "Next".
- Leaving the wizard temporarily, use Active Directory Users and Computers MMC to create a domain account which will act as the cluster service account. This should NOT be a domain administrator account. A simple default user account will work just fine. When finished, return to the wizard.

• On the "Cluster Service Account" screen, enter the details for the service you account you created in the previous step. Click "Next".

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| Remote Control | |
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| New Server Cluster Wizard | |
| Cluster Service Account Enter logn information for the domain account under which the cluster service will for the service will be run. | |
| Liser name: ws03cluster | |
| Password: | |
| Domain: msbob.net.local | |
| This account will be given local administrative rights on all nodes of this cluster to allow for proper operation. | |
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| | Recycle Bin |
| 👌 Start 📔 🎯 🧔 Cluster Administrator | 🍓 🛃 🛃 5:41 PM |

• Review the information provided on the summary screen. If all is correct, continue with the cluster configuration by clicking on the "Quorum" button. Select "Disk Q:" from the drop down dialog box. This is seletcing the quorum disk that this cluster will use to keep state information. If you used a different drive letter for the quorum disk when you created it above, then use that letter instead.

| 🔋 NODE1 on stewart20 - Virtual Machine Remote Control | |
|--|---------------|
| Remote Control | |
| Huster Administrator New Server Cluster Wizard Proposed Cluster Configuration Verify that you want to create a cluster with the following configuration. | |
| Cluster name: CLUSTER.mabob.met.local Cluster IP add Cluster Configuration Quorum 123, 168.01: Publice. Pro- Publice. Pro- Publice. Pro- Publice. Pro- Publice. Pro- Primary A Primary A Cluster service. Name:vel03codowit Pactsword: ************************************ | |
| Cancel | |
| | Recycle Bin |
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• Click "Next" to continue with the cluster configuration.

• Once the cluster configuration is finished, you should see something like this:

| 🖥 NODE1 on stewart20 - Virtual Machine Remote Control | |
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| Remote Control | |
| Cluster Administrator | |
| Creating the Cluster Please wait while the cluster is configured. | |
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| Tasks completed. | |
| View Log Detais Retry | |
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• Finally, you will see the final screen of the Cluster Wizard. You can view the log by clicking on "View Log" or click "Finish" to complete the cluster configuration.

Configuring NODE2

- With NODE1 still running, switch to the Virtual Server Administration Website.
- Either using a physical CD for Windows Server 2003 or an ISO image of the installation CD, boot NODE1 and install Windows Server 2003.
- For purposes of this demonstration, a default install will work with one exception. You'll need to configure the two network cards in the machine with static addresses.
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Setting Up The Clustering Service - Adding the Second Node

- Once Windows Server 2003 is installed on NODE2, insure that everything is working properly. Check the event log, make sure that you can contact the Active Directory domain controller and the other cluster node (NODE1).
- Switch to NODE1's console.
- Start the Cluster Administrator MMC on NODE1. "Start", then "All Programs", then "Administrative Tools" and, finally, "Cluster Administrator".
- You should be seeing the cluster you created earlier. If not, select "Connect to a Cluster" and choose the name of the cluster you created earlier from the list. You should see something like this:

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| Remote Control | | | | | | |
| Cluster Administrator - CLUSTER ((| LUSTER.msbob.net.loo | cal) | | | _ 8 × | |
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| Groups | | State | Description | | | |
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| Resources | Cluster Configuration | | | | | |
| Cluster Configuration | ■NODE1 | Up | | | | |
| Resource Types | | | | | | |
| Private | | | | | | |
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• Click "File", then select "New", then select "Node":

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| 🛱 Cluster Administrator - CLUSTER (| CLUSTER.msbob.net.lo | cal) | | | _ 8 × |
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| Adds nodes to the cluster | | | | Γ | NUM |
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- Click "Next" on the "Welcome to the Add Nodes Wizard" screen.
- On the "Select Computers" screen either type in the name of the second cluster node (NODE2) or click "Browse" and select it. Then click "Add" to add it to the list. Once the node has been added to the list, click "Next":

| NODE1 on stewart20 - Virtual Machine Remote Control | |
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| Remote Control | |
| Cluster Administrator - FLIISTER (FLIISTER.mshob.net.local) | _ 8 × |
| Add Nodes Wizard | |
| Select Computers The computers must be a member of the domain you specified | |
| | × |
| Enter the names of the computers that will be added to the cluster. | |
| Computer name: NODE2 Browse | |
| Selected computers: | |
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• When you click "Next", the Cluster Administrator will analyze the configuration of the second node to be sure it is compatible. If the analysis finds everything working and properly configured, click "Next". Otherwise troubleshoot to resolve any issues.

• On the "Cluster Service Account" screen, make sure that the user name and password for the cluster service account that you created earlier is entered and is correct.

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| Remote Co | ontrol | | |
| Cluste | er Admini | strator - CLUSTER (CLUSTER.mshob.net.local) | _ & × |
| | 50C3 11120 | | |
| | Enter logi | in information for the domain account under which the cluster service will | |
| E | be run. | | |
| Us | er name: | ws03cluster | |
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| 9 | for prop | count will be given local administrative rights on all nodes or this cluster to allow er operation. | |
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- You will now be presented with the proposed cluster configuration. If all the information seems to be correct, click "Next".
- Once the addition of the second node is successful, you will see something similar to this:

| NODE1 on stewart20 - Virtual Machine Remote Control | |
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| Remote Control | _ 8 × |
| E Add Nodes Wizard | |
| Adding Nodes to the Cluster Please wait while the cluster is configured. | |
| ✓ Reanalyzing cluster ✓ Configure cluster services ✓ Configure resource types ✓ Configure resources ✓ Configure resources | |
| < Back Next> Cancel | |
| For Help, press F1 2 Start] ② 중 기업 Cluster Administrator | NUM 6:01 PM |

• Click "Finish" at the "Completing the Add Nodes Wizard" screen. You have now added the second node and you will be returned to the cluster administrator to be greeted by something that looks similar to this:

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| Remote Control | | | | | | |
| Cluster Administrator - [CLUSTER | 🛱 Cluster Administrator - [CLUSTER (CLUSTER.msbob.net.local)] | | | | | |
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| | Name | State | Description | | | |
| 🖻 🦲 Groups | 🚞 Groups | | | | | |
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| Resource Types | MODE1 | Up | | | | |
| 🖃 🧰 Networks | INODE2 | Up | | | | |
| Private | | | | | | |
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| Network Interfaces | | | | | | |
| Active Groups | | | | | | |
| Active Resources | | | | | | |
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• You now have a working 2 node Windows Server 2003 cluster within Virtual Server 2005. Congratulations!