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 Microsoft 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 here or here. 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) -
http://www.microsoft.com/windowsserver2003/techinfo/overview/clustering.mspx

Clustering Services in Windows Server 2003 (Microsoft) -
http://www.microsoft.com/technet/prodtechnol/windowsserver2003/technologies/clustering/default.mspx

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

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

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 Part I, 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".
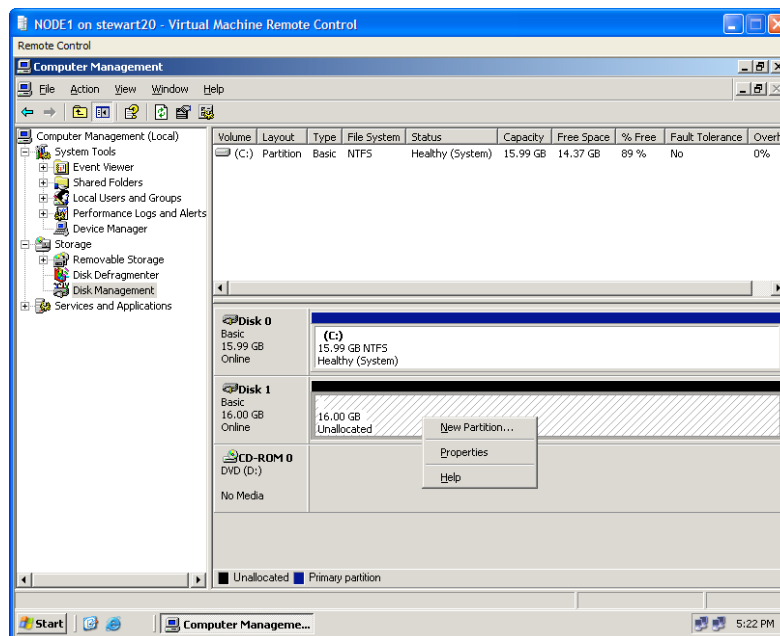
- Using the wizard, accept the default selections for Partition Type and Partition Size. For drive letter, I usually select "Q:" just because it makes sense. This is the "Quorum" disk after all. Finish going through the wizard, selecting "Perform Quick Format" when asked to format the drive. You should 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.
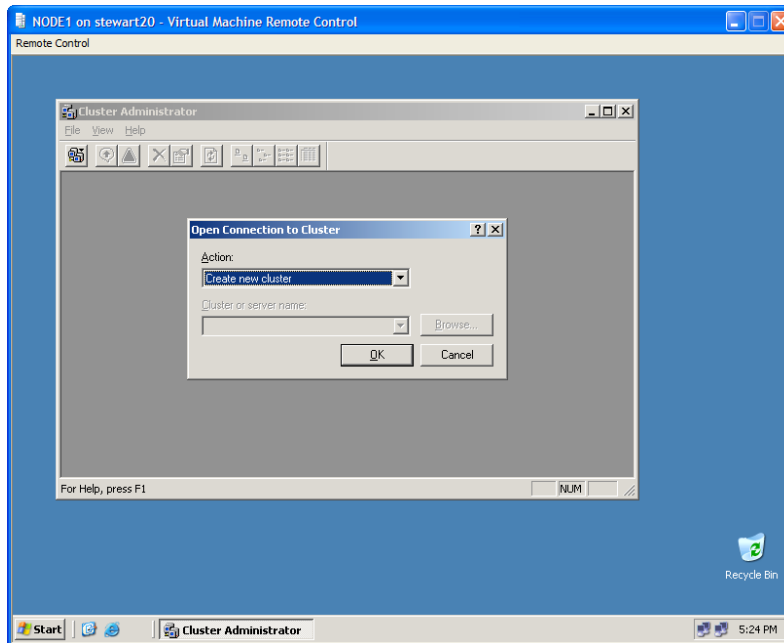

- Click "Next" at the Cluster Wizard welcome screen.

- 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".
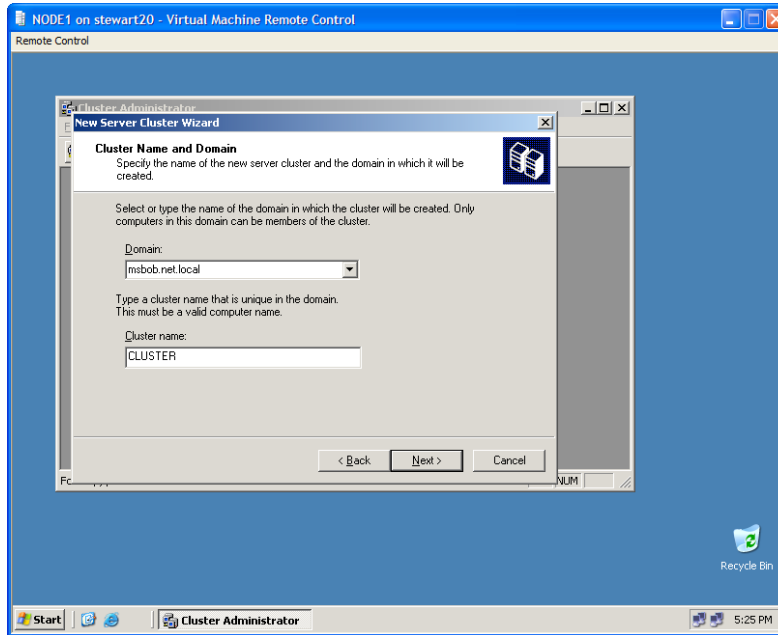

- On the "Select Computer" screen, enter the name (or browse) to the first node in the cluster. In this case, that would be the machine you're working on - NODE1. Click "Next".
- The Cluster Administrator will now perform a preliminary analysis of the configuration. If it was successful, click "Next" 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".
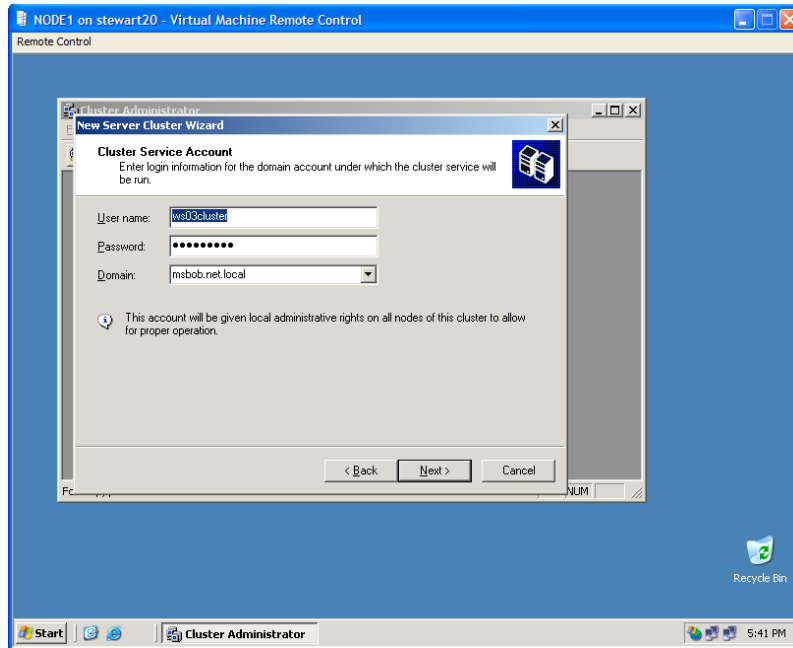

- Review the information provided on the summary screen. If all is correct, continue with the cluster configuration by clicking on the "Quorum" button. Select "Disk Q:" from the drop down dialog box. This is seletcing the quorum disk that this cluster will use to keep state information. If you used a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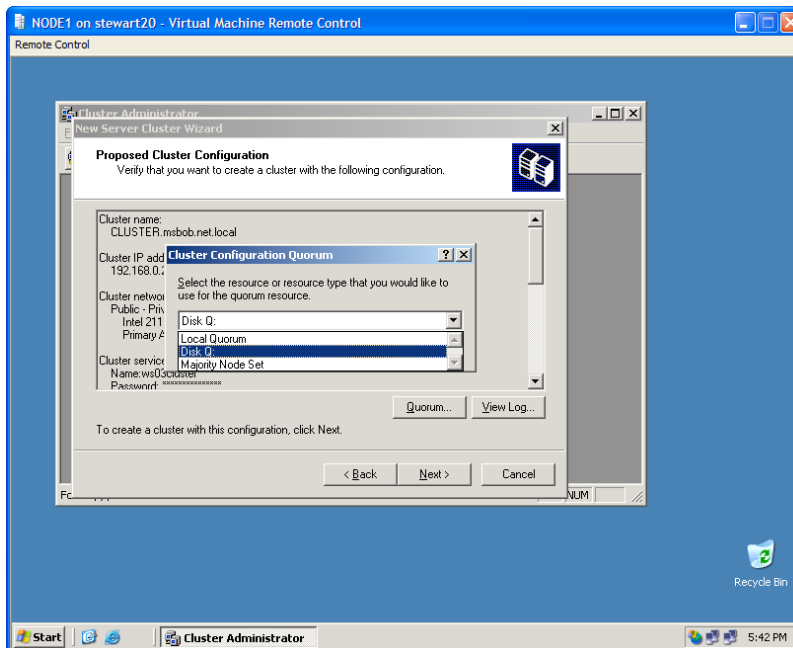
- Click "Next" to continue with the cluster configuration.

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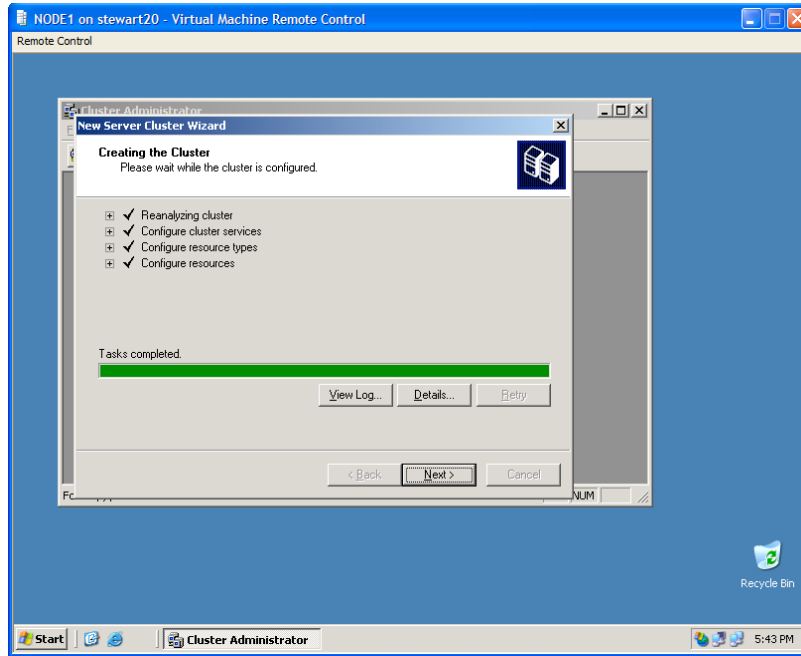

- Finally, you will see the final screen of the Cluster Wizard. You can view the log by clicking on "View Log" or click "Finish" to complete the cluster configuration.

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.
- 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.
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- 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.

*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:
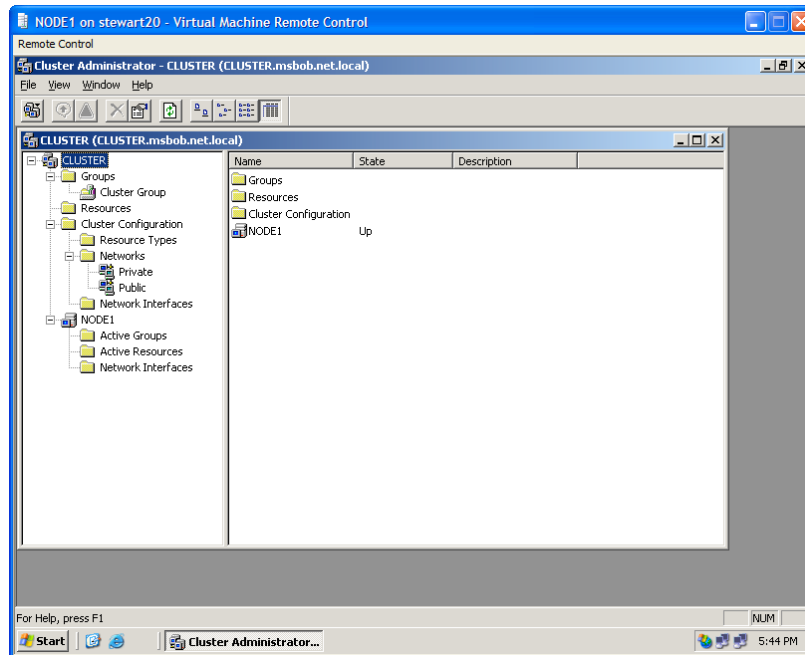
- Click "File", then select "New", then select "Node":
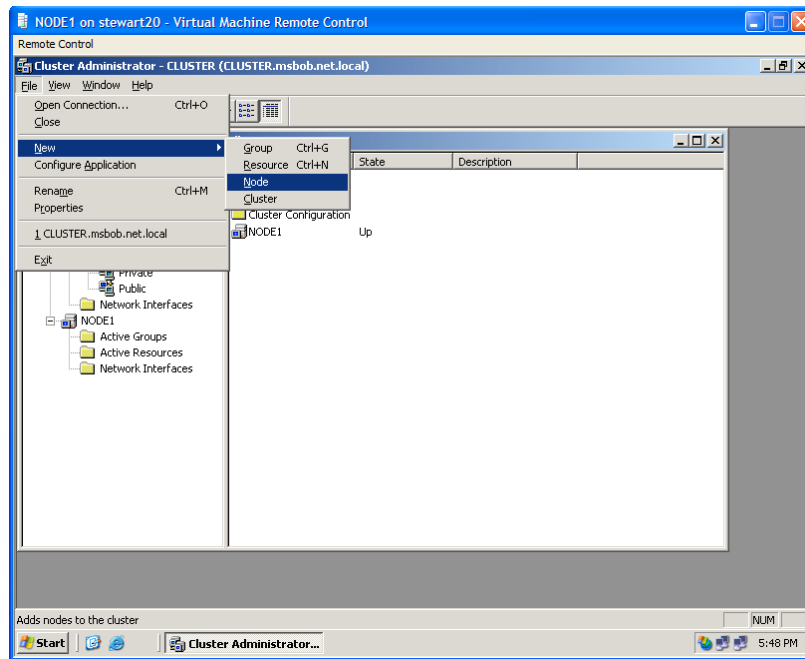
- Click "Next" on the "Welcome to the Add Nodes Wizard" screen.
- On the "Select Computers" screen either type in the name of the second cluster node (NODE2) or click "Browse" and select it. Then click "Add" to add it to the list. Once the node has been added to the list, click "Next":
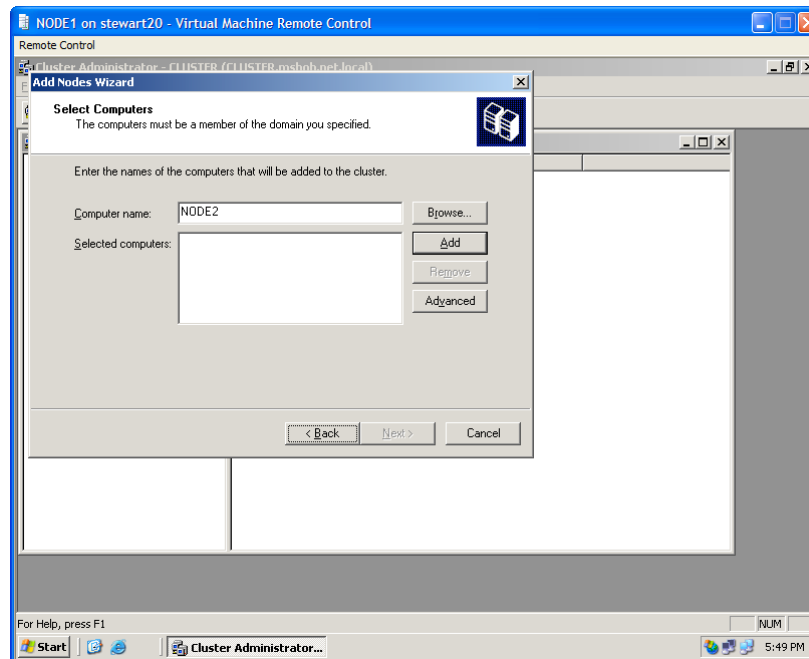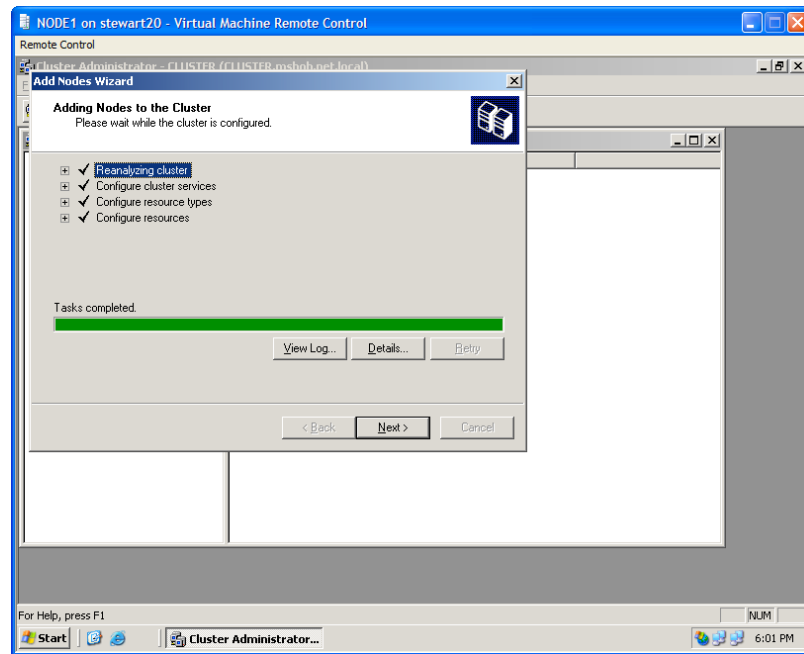

- When you click "Next", the Cluster Administrator will analyze the configuration of the second node to be sure it is compatible. If the analysis finds everything working and properly configured, click "Next". Otherwise troubleshoot to resolve any issues.

- 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.
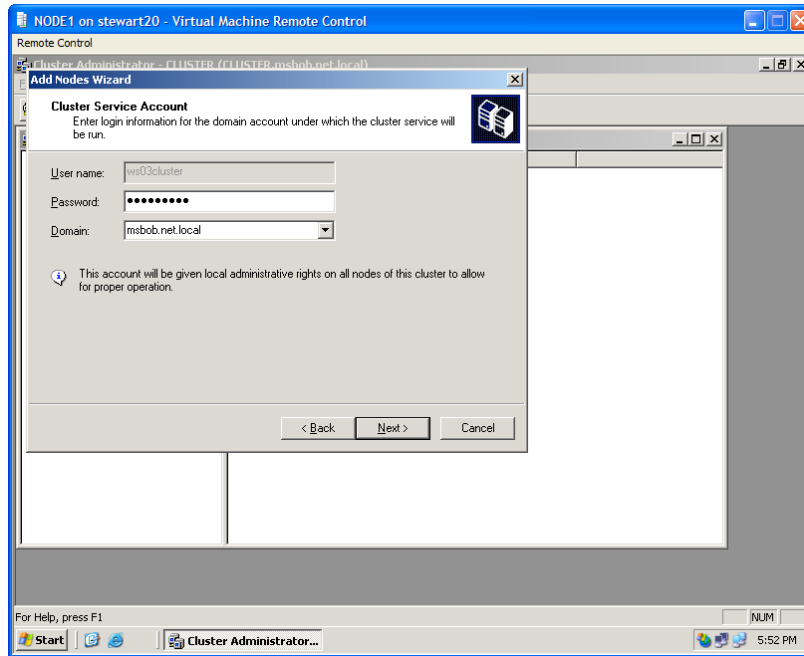
- You will now be presented with the proposed cluster configuration. If all the information seems to be correct, click "Next".
- Once the addition of the second node is successful, you will see something similar to this:

- 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:
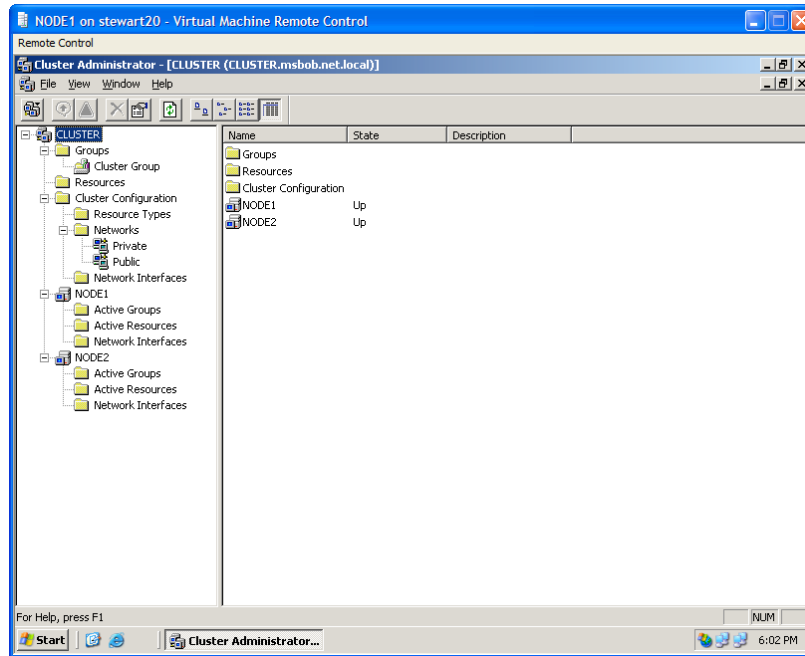
- You now have a working 2 node Windows Server 2003 cluster within Virtual Server 2005. Congratulations!