



Deploying Windows Streaming Media Servers NLB Cluster and metaSAN

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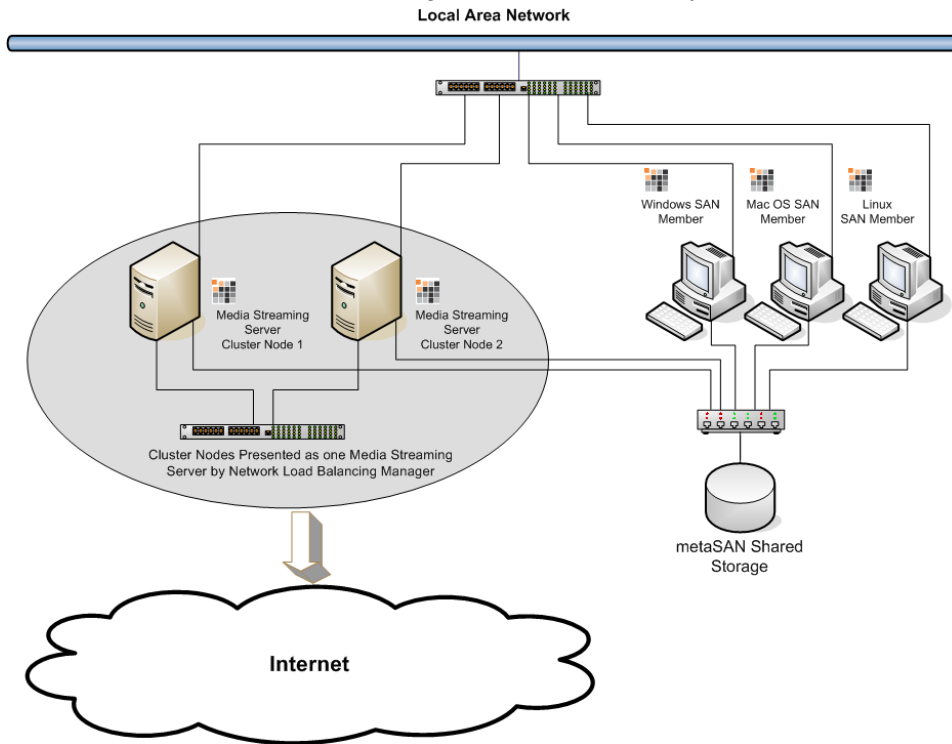
Introduction

Using Windows Network Load Balancing Manager you can create a cluster with two or more nodes running Windows Server 2003 and set up to work as Windows Streaming Media Servers. This cluster will be used for streaming media on the Internet and will appear to users as one Streaming Media Server. Should one cluster node fail, another node will take over streaming media. This way you can ensure uninterrupted streaming of media as well as fair distribution of network traffic between the cluster nodes. Combining this with metaSAN's file-level sharing capabilities in a SAN environment, you can deploy a network in which media files to be streamed are stored on the SAN volumes and are made accessible directly over the Fibre Channel to other workstations too.

Objectives

Deploy a SAN managed by MetaSAN in which two machines running Windows Server 2003 and set up to work as Streaming Media Servers are united in a cluster managed by Network Load Balancing Manager. The two nodes participate in the SAN as ordinary Members and access the shared MetaSAN storage directly as other SAN Members do (Windows, Mac OS and Linux

machines). The two cluster nodes appear to machines on the Internet as one Streaming Media Server and network traffic when streaming media from them is fairly distributed.



Requirements

Cluster Nodes:

- Two identical computers that meet the requirements for cluster nodes. Check Microsoft's web site for certified configurations. All nodes in the cluster should be of the same architecture.
- The two nodes should run the same version and service packs of the operating system. In this deployment scenario Windows Server 2003 Enterprise Edition, Service Pack 1.
- Each machine should have at least two Ethernet adapters. One of them serves for communication between cluster nodes. These interfaces should be connected through a hub or switch on an isolated network. The second interface serves for communication with the rest of the machines on the network.
- Cluster nodes should use static IP addresses. Consult your system administrator for available static IP addresses.

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- All nodes in the cluster must be in the same domain and have the same domain role. In this scenario, both nodes are domain members.
- metaSAN 3.x or later for Windows is installed on both cluster nodes.

metaSAN/metaLAN clients:

- Computers should meet the minimum hardware requirements outlined in the metaSAN User's Guide.
- metaSAN/metaSAN iSCSI/metaLAN client computers may run one of the following operating systems (OS): Windows, Mac OS X or Linux. Consult the metaSAN User's Guide or go to www.tiger-technology.com/metaSAN#SystemReqs for supported OS versions.

Defining the Setup Steps

The setup of a cluster with two nodes running as Streaming Media Servers in a SAN managed by metaSAN goes through the following stages:

- a. Setting up the Networks on Node 1 and Node 2
- b. Adding the Nodes to the same domain
- c. Configuring the cluster with Network Load Balancing Manager
- d. Installing and configuring metaSAN for work in cluster on Node 1
- e. Creating the SAN definition
- f. Installing and configuring metaSAN for work in cluster on Node 2
- g. Setting up both nodes to work as Streaming Media Servers.
- h. Testing the configuration with Windows Media Load Simulator

The following table shows which nodes and storage devices should be turned on during each setup phase.

Step	Node 1	Node 2	Storage
Set up networks	On	On	Off
Adding the nodes to the same domain			
Configuring Network Load Balancing Manager on Node 1	On	Off	On
Configuring Network Load Balancing Manager on Node 2	On	Off	On
Installing MetaSAN on node 1	On	On	On
Configuring MetaSAN on node 1	On	On	On
Creating SAN Definition	On	On	On

Step	Node 1	Node 2	Storage
Installing MetaSAN on node 2	On	On	On
Configuring MetaSAN on node 2	On	On	On
Setting up Node 1 as Streaming Media Servers	On	Off	On
Setting up Node 2 as Streaming Media Servers	Off	On	On

Table 1: Order of turning on computers and storage devices in a cluster

Setting up Networks

Each cluster node requires at least two network interface cards. These interfaces must be connected to different isolated networks.

In this deployment scenario we use two Ethernet adapters on each cluster node. The first one is connected to the LAN and cluster nodes can be accessed from other client machines through this adapter. This adapter is also used for MetaSAN communication. In this document, we will refer to this adapter as Public.

The second Ethernet adapter is used for private communication between cluster nodes. We will refer to this adapter as Private. Private adapters should be connected to an isolated network and other client should not be able to access the cluster nodes through the Private nodes. In this scenario the Private adapters are connected to a separate LAN switch.

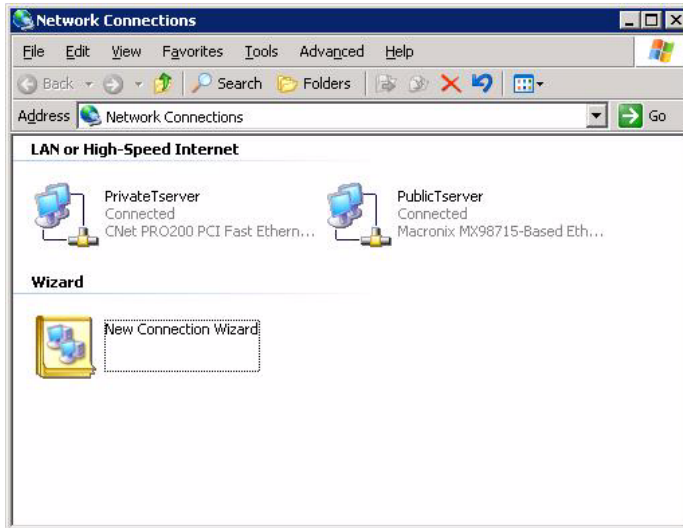
Setting up the Network for Node 1

First, we configure the Public network for Node 1. Use static IP addresses. Consult the system administrator for available IP addresses.

To configure the IP address of Node 1 for the Public network:

1. Open Control Panel and double-click Network Connections.
2. Rename the adapter you will use for public communication.

In this scenario TSERVER machine is Node 1. The assigned name of the public adapter is PublicTserver.



3. Display the Properties dialog for PublicTserver adapter.
4. Double-click Internet Protocol (TCP/IP).
5. Choose "Use the following IP address".
6. For IP address, set 10.200.4.100.
7. Set subnet mask to 255.255.0.0
8. Set Default Gateway to 10.200.0.1

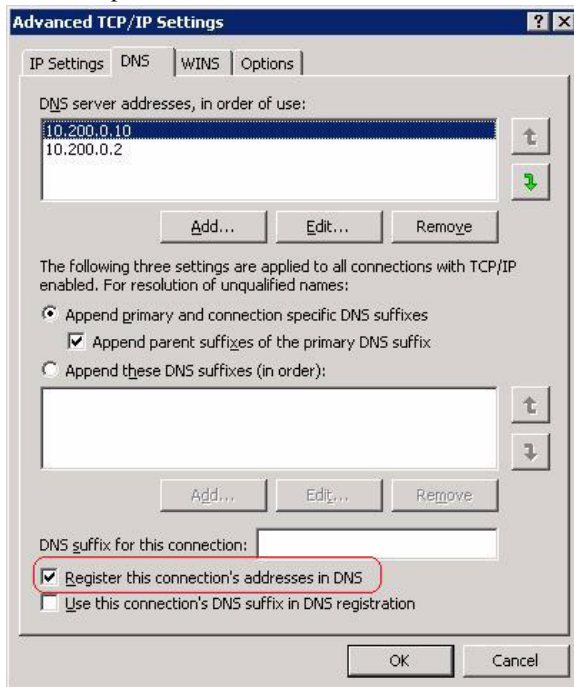
9. Select "Use the following DNS server addresses" option and provide the following IP addresses for Preferred and Alternate DNS servers: 10.200.0.10 and 10.200.0.2.

The screenshot shows the "Internet Protocol (TCP/IP) Properties" dialog box with the "General" tab selected. The dialog box contains the following information:

- General** tab is active.
- Text: "You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings."
- Radio button "Obtain an IP address automatically" is unselected.
- Radio button "Use the following IP address:" is selected.
- IP address: 10 . 200 . 4 . 100
- Subnet mask: 255 . 255 . 0 . 0
- Default gateway: 10 . 200 . 0 . 1
- Radio button "Obtain DNS server address automatically" is unselected.
- Radio button "Use the following DNS server addresses:" is selected.
- Preferred DNS server: 10 . 200 . 0 . 10
- Alternate DNS server: 10 . 200 . 0 . 2
- Buttons: "Advanced...", "OK", and "Cancel".

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10. Click Advanced and select the DNS tab. Make sure that "Register this connection's addresses in DNS" option is enabled.



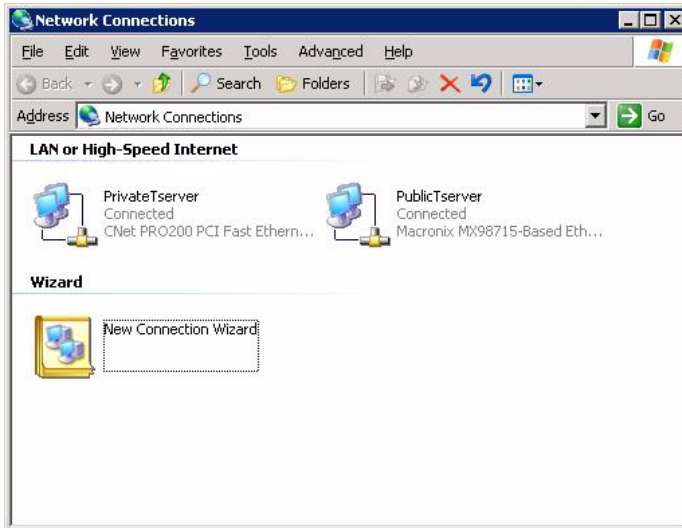
11. Click OK to close the Advanced settings.

12. Click OK in each subsequent dialog to apply the Ethernet Adapter settings.

To configure the IP address of Node 1 for the Private network:

1. Open Control Panel and double-click Network Connections.
2. Rename the adapter you will use for private communication.

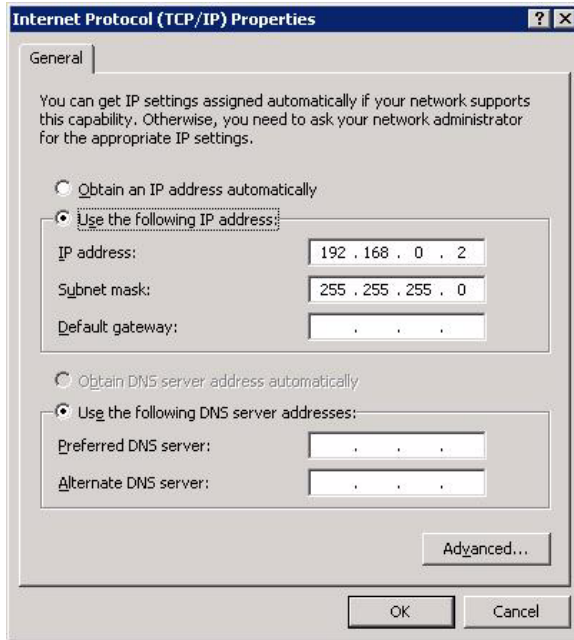
In this scenario TSERVER machine is Node 1. The assigned name of the private adapter is PrivateTserver.



3. Display the Properties dialog for PrivateTserver adapter.
4. Double-click Internet Protocol (TCP/IP).
5. Choose Use the following IP address.
6. For IP address, set 192.168.0.2.
7. Set subnet mask to 255.255.255.0
8. Do not provide IP address for Default Gateway.

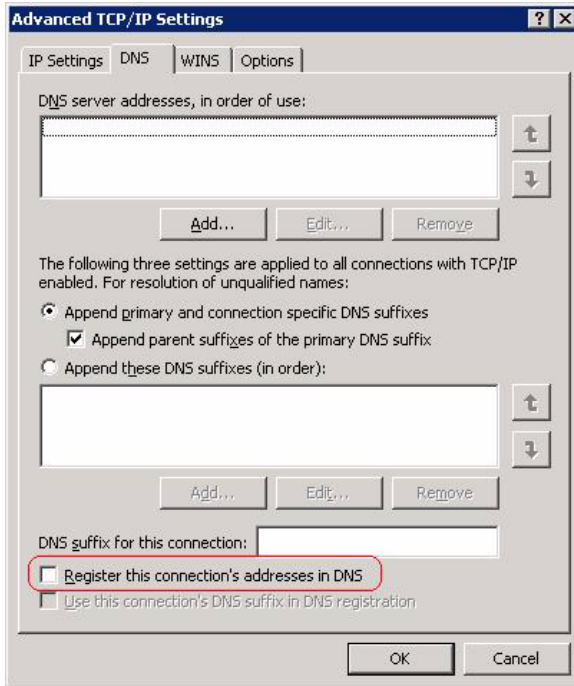
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9. Make sure you do not provide any IP addresses for DNS servers.



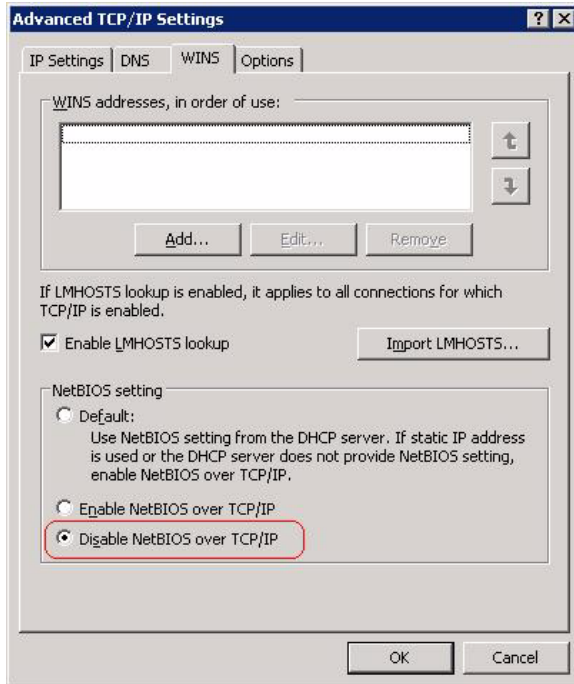
10. Click Advanced.

11. Select the DNS tab and clear the check box for Register this connection's addresses in DNS.



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12.Open the WINS tab and select Disable NetBIOS over TCP/IP.



13.Click OK to apply the Advanced settings.

14.Click OK several times to apply the Ethernet Adapter settings.

Setting up the Network for Node 2

To set up the network for Node 2 follow the same steps as for Node 1 but use different IP addresses.

Set the name to PublicAthlon for the public connection (computer Athlon2003 is used as Node 2) and set the IP address to 10.200.4.101.

Set the name to PrivateAthlon for the private connection and set the IP address to 192.168.0.1.

Verifying the Network Setup

To verify that public and private networks work properly, ping all IP addresses from each nodes. You should be able to ping all IP address, both locally and on remote nodes. To verify name resolution, ping each node from a client using the node's name. You should get only the public IP address of the node.

Adding the Nodes to the Same Domain

If not already added to the same domain, now is the time to make both nodes members of the same domain. In this scenario, both nodes are added to domain TEST. If necessary, consult the administrator of TEST domain for assistance to add the nodes to the domain.

On the Domain Controller, create a domain user Cluster. This user will be used to run the cluster service on the cluster nodes. It is NOT necessary to make this user member of the Domain Administrators group. However, you need to add this user to the local Administrators group on each cluster node.

To add user Cluster to local Administrators:

1. Log in to Node 1 with account with administrative privileges.
2. Right-click My Computer icon and choose Manage.
3. Expand the Local Users and Groups item and select Groups.
4. Double-click the Administrators group.
5. Click Add.
6. Type "cluster" and click Check Names.
If you are logged in as local administrator, you will be prompted to provide domain user name and password to be able to access domain resources.
7. Click OK in each subsequent dialog till you close the Administrators Properties dialog.
8. Close the Windows Management Console.
9. Repeat the above steps on Node 2.

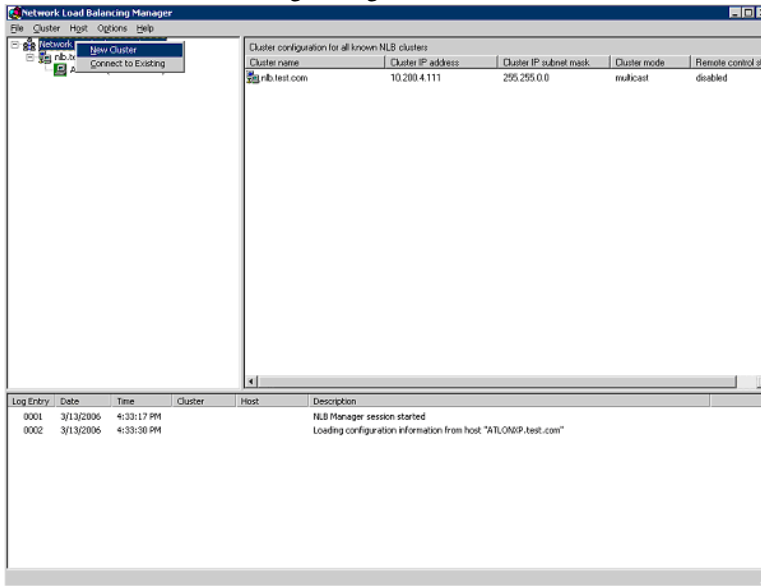
Configuring the Cluster with Network Load Balancing Server

Once your network is set up, you are ready to create the cluster using Windows Network Load Balancing Manager. You configure the cluster on the first node. At this time the second node should be shutdown.

To create the cluster:

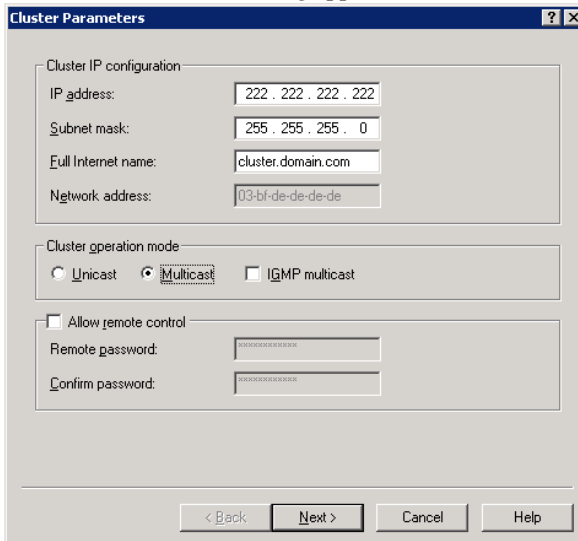
1. In Control Panel of Node 1, click Administrative Tools and then Network Load Balancing Manager.

The Network Load Balancing Manager Starts.



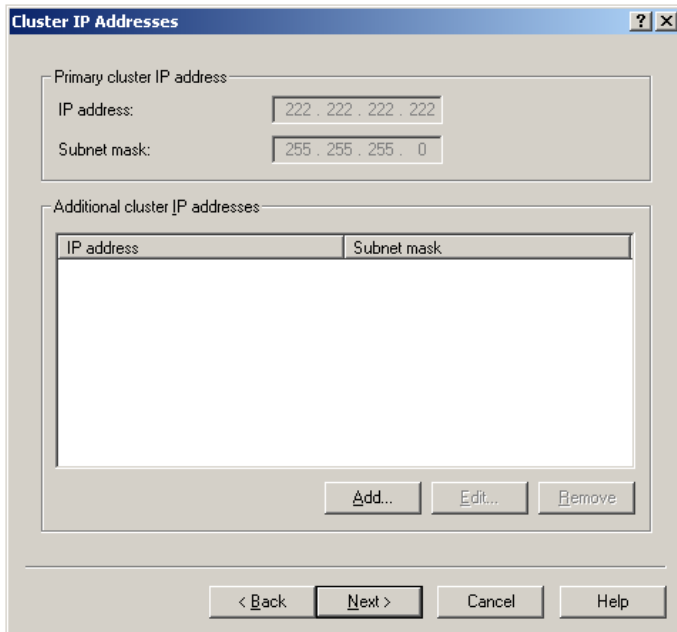
2. In the Cluster menu, click New.

The Cluster Parameters dialog appears.



3. Set the IP address of the cluster to 222.222.222.222, the subnet mask to 255.255.255.0 and enter "cluster.domain.com" as Internet name.
4. In the "Cluster operation mode", select Multicast.
5. Make sure "Allow remote control" check-box is disabled and click Next.

The Cluster IP Address dialog appears, displaying the primary IP address you have specified.

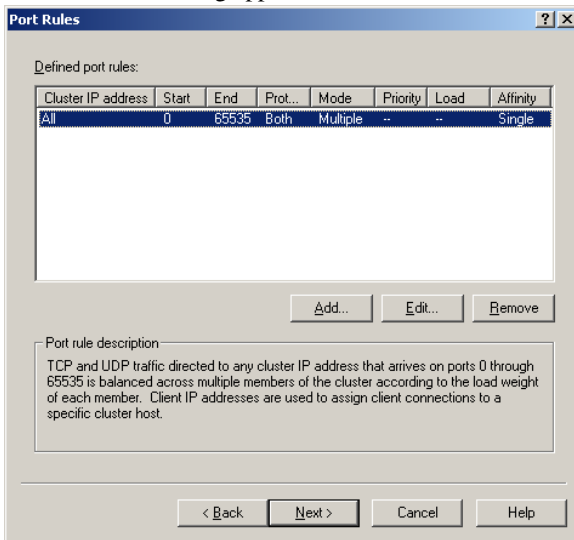


The image shows a Windows-style dialog box titled "Cluster IP Addresses". It has a blue title bar with a question mark icon and a close button. The dialog is divided into two main sections. The first section, "Primary cluster IP address", contains two text input fields: "IP address:" with the value "222 . 222 . 222 . 222" and "Subnet mask:" with the value "255 . 255 . 255 . 0". The second section, "Additional cluster IP addresses", contains a table with two columns: "IP address" and "Subnet mask". The table is currently empty. Below the table are three buttons: "Add...", "Edit...", and "Remove". At the bottom of the dialog are four buttons: "< Back", "Next >", "Cancel", and "Help".

IP address	Subnet mask
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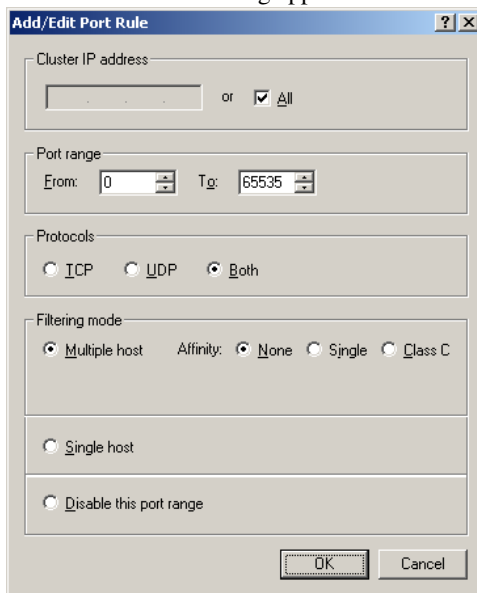
6. Click Next.

The Port Rules dialog appears.



7. Select the rule and click Edit.

Add/Edit Port Rule dialog appears.



8. In the Protocols field select Both, and in Filtering Mode, select Multiple Hosts and None affinity, then click OK and in the Port Rules dialog, click Next.

The Connect dialog appears.

Connect

Connect to one host that is to be part of the new cluster and select the cluster interface

Host:

Connection status:
Connected

Interfaces available for configuring a new cluster

Interface name	Interface IP	Cluster IP
PublicT server	10.200.4.100	
PrivateT server	192.168.0.2	

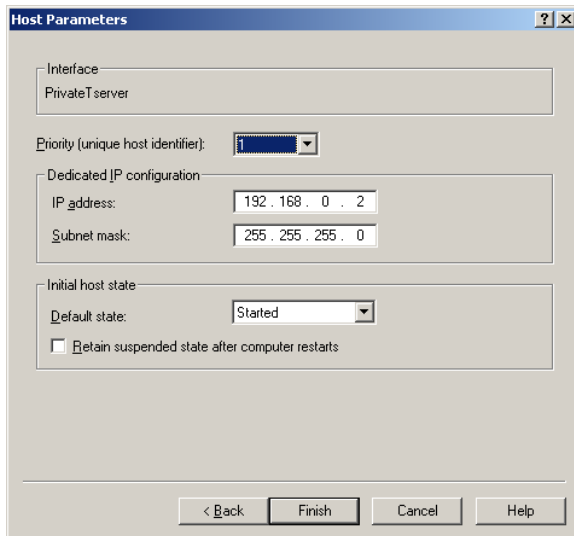
< Back Next > Cancel Help

9. In the Host field, enter one of the IP addresses of Node 1 and click Connect.

The Network Load Balancing Manager lists all interfaces of the machine it has detected.

10.Select "PrivateTserver" in the list and click Next.

The Host Parameters dialog appears. It sets the priority of Node1 to 1 and lists its private NIC's IP address and the subnet mask.



11.In the "Initial host state" select Started and then click Finish.

12.Repeat the above steps on Cluster Node 2, setting its interface to PrivateAthlon with IP address 192.168.0.1 and its unique host identifier priority to 2.

Preparing for metaSAN Installation on Cluster Node 1

When your Server Cluster is configured successfully, you can start with the installation of MetaSAN 2.1 on the first node. Before you do this, however, verify that:

- a.** The second node is shut down.
- b.** The storage devices you are going to share through MetaSAN are connected to Node 1.
- c.** No drive letters are assigned to partitions/volumes that will be managed by metaSAN.

Installing metaSAN on Cluster Node 1

To install metaSAN on the first node, follow these steps:

1. Double-click the metaSAN installation file.
2. Follow the on-screen instructions of the installation wizard.
3. Accept the license agreement when prompted.
4. If available, backup any dynamic disks configuration.
5. Cancel the metaSAN configuration Wizard.
6. DO NOT REBOOT the computer when prompted to do so.

Configuring the SAN Definition

Before you create a new SAN definition, you must configure metaSAN to work with the Public interface. Thus, all new SAN definitions will use the network settings of this interface.

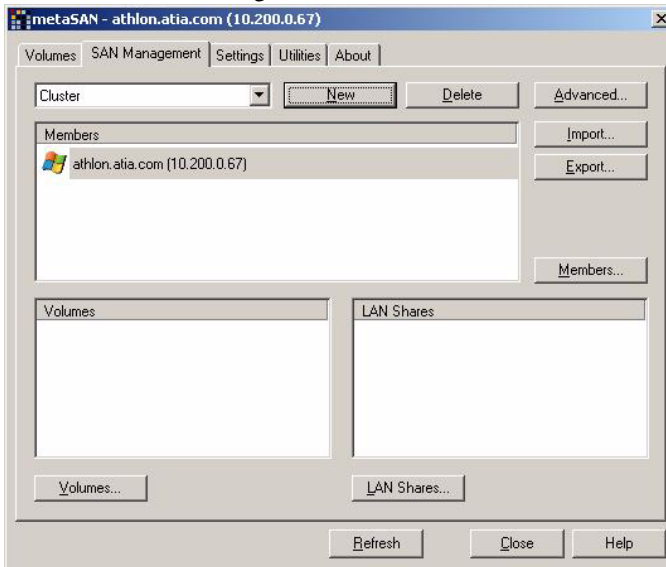
To choose a network interface in metaSAN:

1. Open Control Panel and double-click metaSAN.
2. Select the Settings tab.
3. From the Default Synchronization Interface drop down box, select the public interface (10.200.4.100).
4. Click Apply and restart your computer.

Every new SAN definition you create on this machine will use the IP range of the public interface. To add the cluster nodes to the same SAN definition you need to create one with the new settings for IP range.

To create a SAN definition:

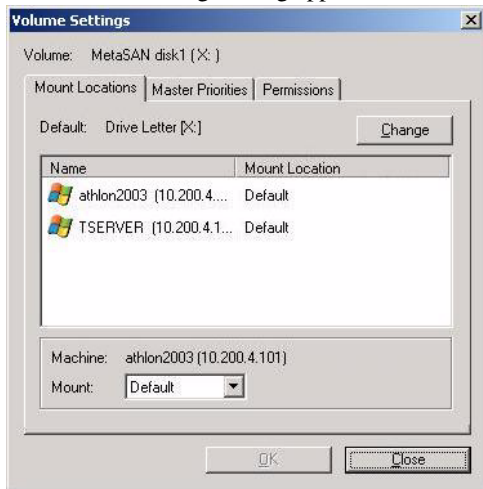
1. Open Control Panel and double-click metaSAN.
2. Select the SAN Management tab and click New.



3. Type a name for the new SAN definition and click OK.
4. Click Members.
The Members Management dialog appears.
5. Click Add Member, type the public IP address of the second cluster node and click OK.
6. Click Apply and then Close.
7. Click Volumes.
The Volumes Management dialog appears.
8. Click Add Volume, select a volume and click OK.

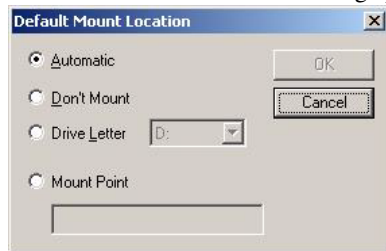
9. Select the volume and click Advanced.

The Volume Settings dialog appears.



10. Select Mount Locations tab and click the Change button.

The Default Mount Location dialog appears.



11. Choose Drive Letter, select a drive letter that is not used on both cluster computers and click OK.
12. Click OK to close the Volume Settings dialog.
13. Repeat steps 8-12 for every volume you want to add to the SAN definition.
14. Click Apply and then Close.

Installing metaSAN on Cluster Node 2

With Server Cluster running and configured SAN definition, it is time to install metaSAN on the second cluster node. Boot cluster node 2.

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Important: *Before you start the installation of metaSAN make sure that no drive letters are assigned to partitions/volumes that will be shared through metaSAN.*

To install metaSAN on the second node, follow these steps:

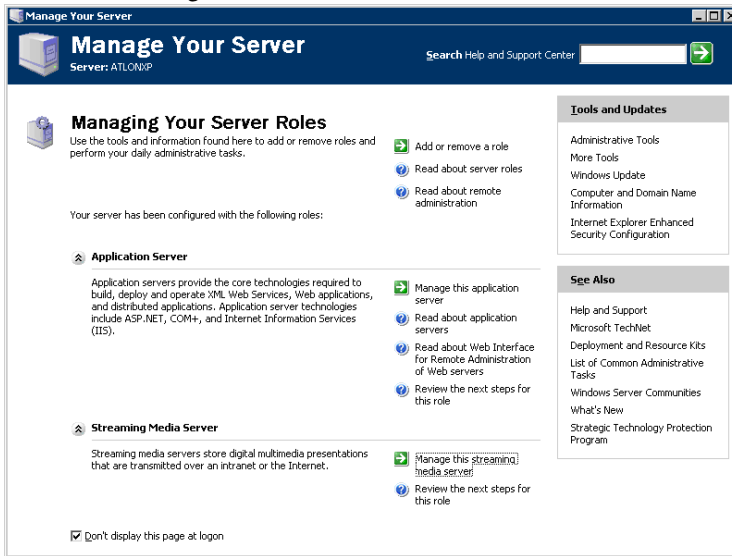
1. Double-click the metaSAN installation file.
2. Follow the on-screen instructions of the installation wizard.
3. Accept the license agreement when prompted.
4. If available, backup any dynamic disks configuration.
5. Cancel the metaSAN configuration Wizard.
6. Reboot the computer.
7. Activate metaSAN on cluster node 2.

Setting Up Cluster Nodes as Streaming Media Servers

After you have installed metaSAN on both cluster nodes and have added them to a SAN definition with volume(s) in it, you can set up each Windows Server 2003 to act as a Streaming Media Server.

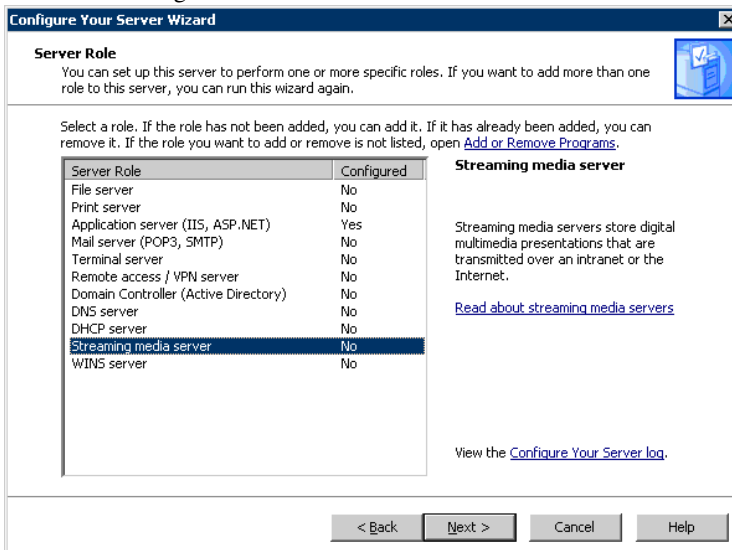
To set up cluster nodes as Streaming Media Servers:

1. On cluster node 1 go to Control Panel | Administrative Tools and select Manage Your Server.



2. Click "Add or remove a role" and in the window that appears, click Next.

3. Select "Streaming Media Server" and click Next.



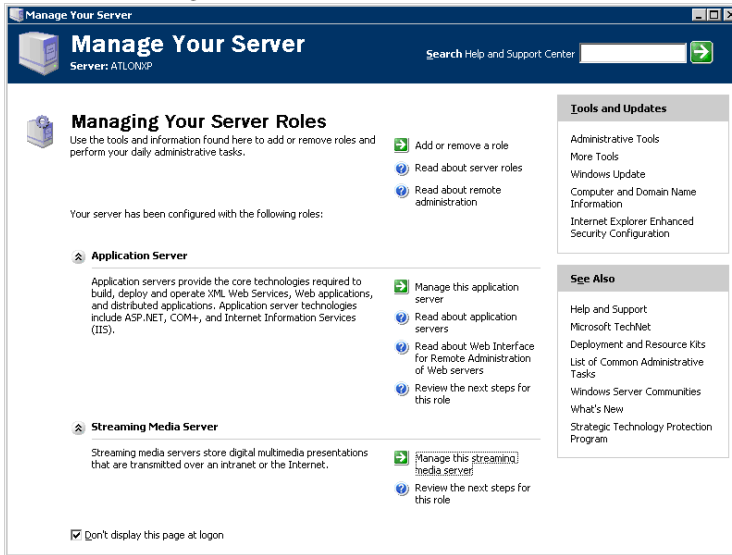
4. Select to install Windows Media Service, click Next and then Finish.

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5. Repeat the above steps on cluster node 2 as well.

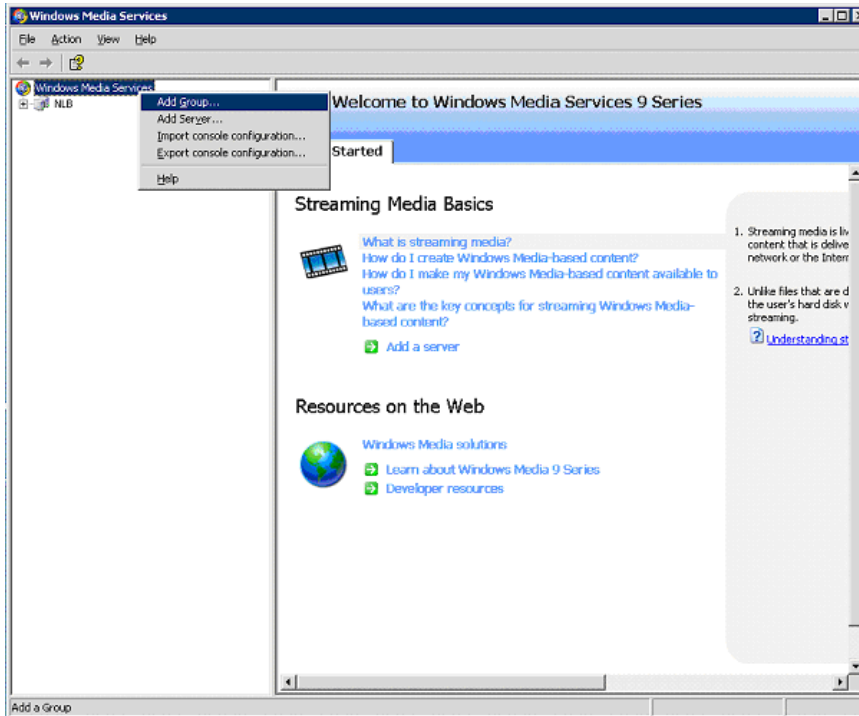
To configure streaming media service:

1. On cluster node 1 go to Control Panel | Administrative Tools and select Manage Your Server.

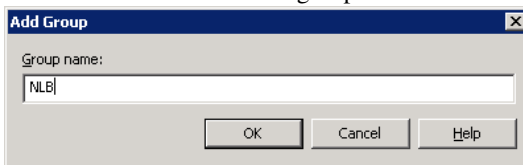


2. Click "Manage this streaming media service".

3. In the Windows Media Services, right-click Windows Media Services in the tree-view and select "Add Group..." in the context menu.

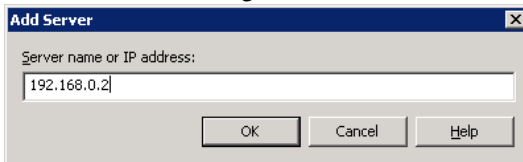


4. Enter "NLB" as name of the group and click OK.



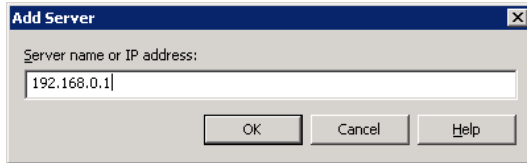
5. Right-click "NLB" in the tree-view and select "Add server" from the context menu.

6. In the Add Server dialog, enter the IP address for PrivateTserver and click OK.

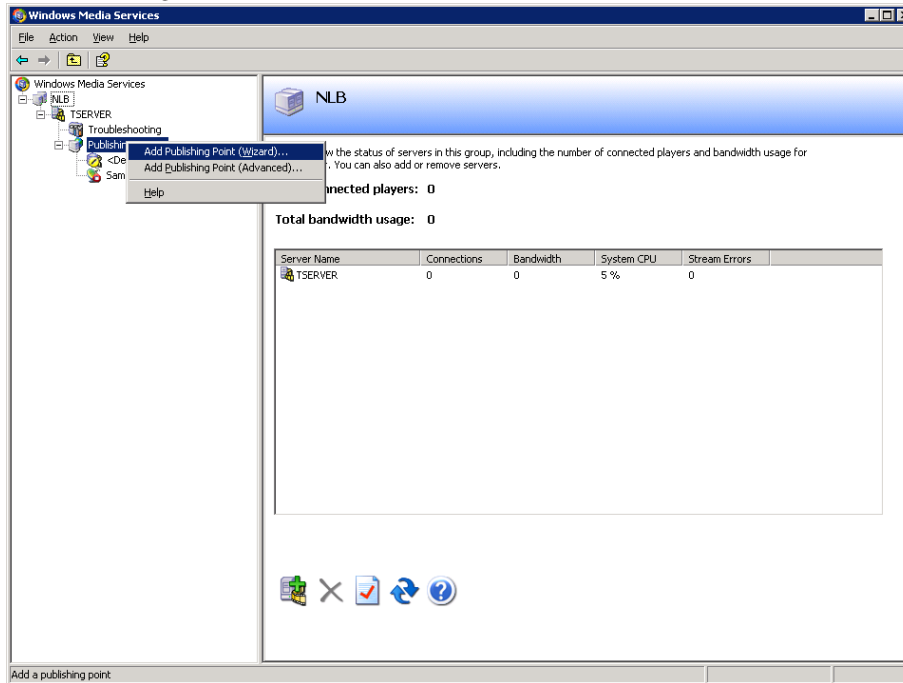


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7. Again select "Add Server" and this time enter the IP address for PrivateAthlon, and click OK.

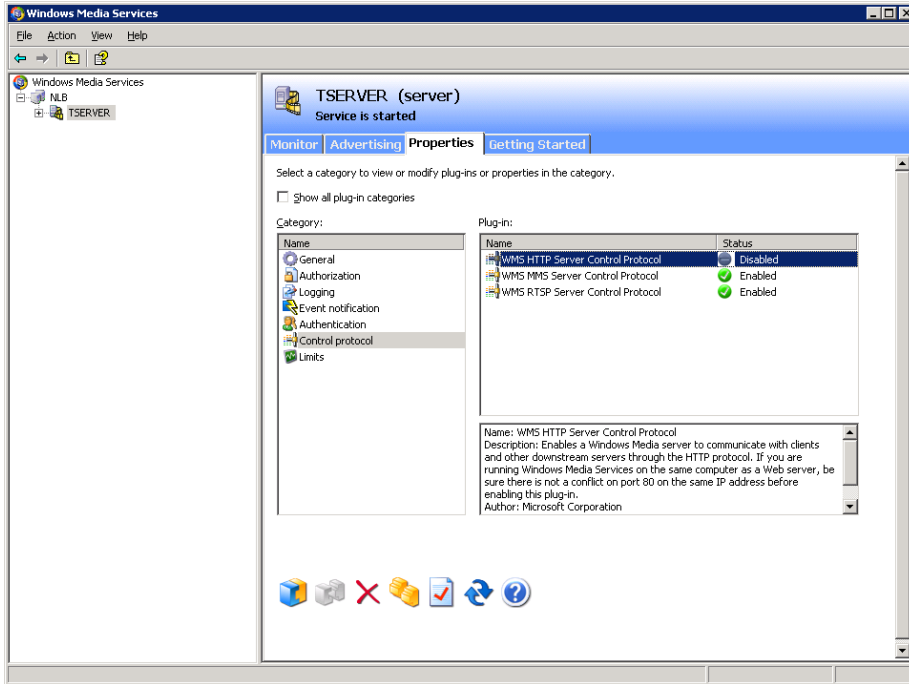


8. In the tree-view expand the node of Tserver, right-click the Publishing Points node and select "Add Publishing Point (Wizard)..." from the context menu.



9. Using the wizard, configure the publishing point settings depending on the your needs, create a play-list and set a SAN volume or directory on it as location for media files to be streamed.

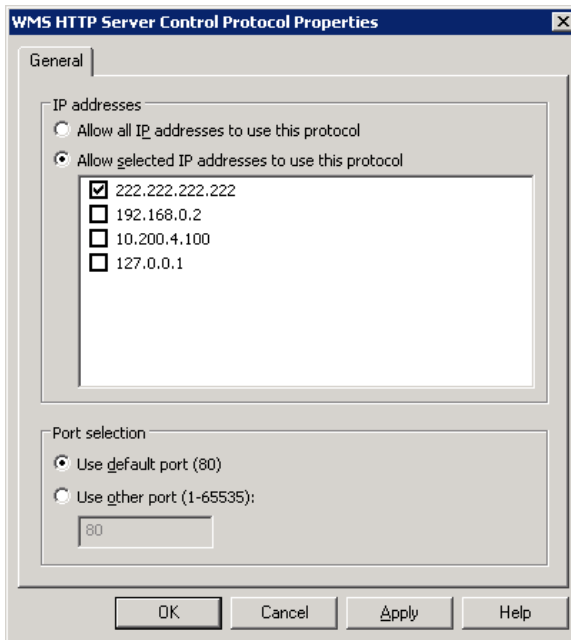
10. Select cluster node 1 in the tree-view, select Properties tab and then Control Protocol.



11. Double click WMS HTTP Server Control Protocol Properties.

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12. In the WMS HTTP Server Control Protocol Properties dialog, select "Allow selected IP addresses to use this protocol" and select the IP address of the cluster 222.222.222.222, then click OK.



13. Repeat the above steps for cluster Node 2 (AthlonXP).

Testing the Configuration with Windows Media Load Simulator

The final phase of this scenario is to verify that you have configured everything properly and media streamed by your cluster is fairly distributed between its nodes. You can do this with Windows Media Load Simulator 9, which simulates a large number of client requests to a streaming media server. The tool is free for download at Microsoft's website at: <http://www.microsoft.com/downloads/details.aspx?familyid=0304afa3-e414-4dec-82a4-2d58ac75c833&displaylang=en>

You can find more information and detailed steps for testing the configuration at: http://www.microsoft.com/windows/windowsmedia/howto/articles/loadsim.aspx#running_the_test_plcy