

VMware[®] ESX Server 3.0.0 with a PS Series Group Frequently Asked Questions

Abstract

This Frequently Asked Question report addresses common questions on how to use VMware ESX Server 3.0 with PS Series storage arrays from EqualLogic.

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September 2006

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FAQ Revision Information

The following table describes the release history of this FAQ.

Technical Report Revision	Date	Change
1.0	09/2006	Initial release

Introduction

This Frequently Asked Question (FAQ) file addresses VMware 3.0.0.

Prerequisites

Should you need to access the array you need the following:

- Laptop or server running Windows XP, Windows 2003 Server, or Windows 2003 R2.
- 1 CAT-5E Ethernet cable.
- Web browser, such as IE or Mozilla with Sun's Java, version 1.5 or higher.
- Serial port on your server / laptop. If you do not have one, you can use a USB-to-serial port converter cable.
- The serial port and null modem cables that ship with the array.
- A terminal emulation program. For example, you can use HyperTerminal or SecureCRT on Windows. Use the following settings:
 - 9600 baud
 - 1 stop bit
 - No parity
 - 8 data bits
 - No hardware flow control

VMware High Availability (HA)

The questions and answers in this section pertain to the VMware High Availability (HA) feature.

After a reboot I got the message, “error occurred during configuration of the HA Agent of the host.”

In the Events tab, this message appears: “/opt/LGTOaam512/bin/ff_startup failed.”

There are multiple possible causes for this problem.

- Legato Automated Availability Manager v5.12 could be generating the error. To fix the error in this case, put a 60 second delay in the `/opt/LGTOaam512/bin/ff_startup.pl` file. Insert a “sleep 60” command just before the line that begins with `&start_agents (@ARGV)`; (this function appears only once in the script, and should be near line 128).

```
sleep 60;
&start_agents (@ARGV);
```

After this is done, disable and re-enable HA on the cluster and wait until everything is configured. Make sure that the IP address lookup works correctly. To do so, run the

```
# /opt/LGTOaam512/bin/ft_gethostbyname <name>
```

command on all the ESX hosts in the cluster. Confirm that the command returns the IP address and host name of each server.

For example:

```
# /opt/LGTOaam512/bin/ft_gethostbyname larry-esx3
172.19.51.45 larry-esx3
```

Confirm that all the IP addresses are correct. There should be only one IP address for each VMware ESX server.

- Another possible cause of these messages involves Cisco switches. Ensure that “Portfast” is enabled on all ports used with the ESX server to resolve the problem.

VMware Software iSCSI Initiators

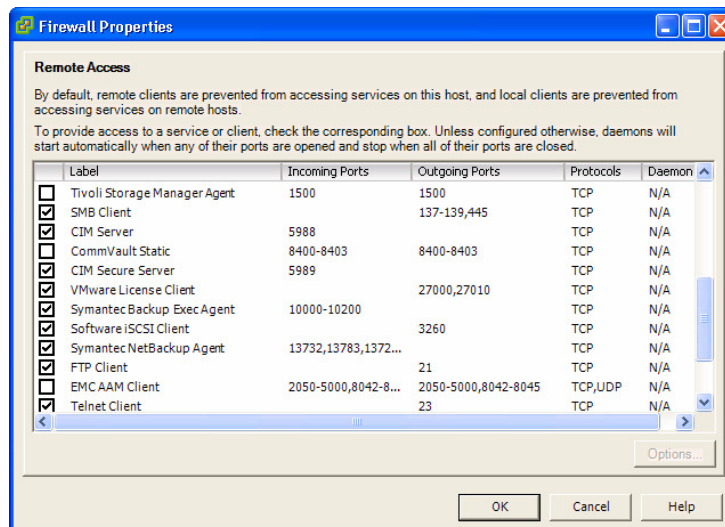
The questions and answers in this section have to do with the use of the software iSCSI initiator.

Existing volumes aren't visible to the Software Initiator.

Some possibilities causes of this problem are:

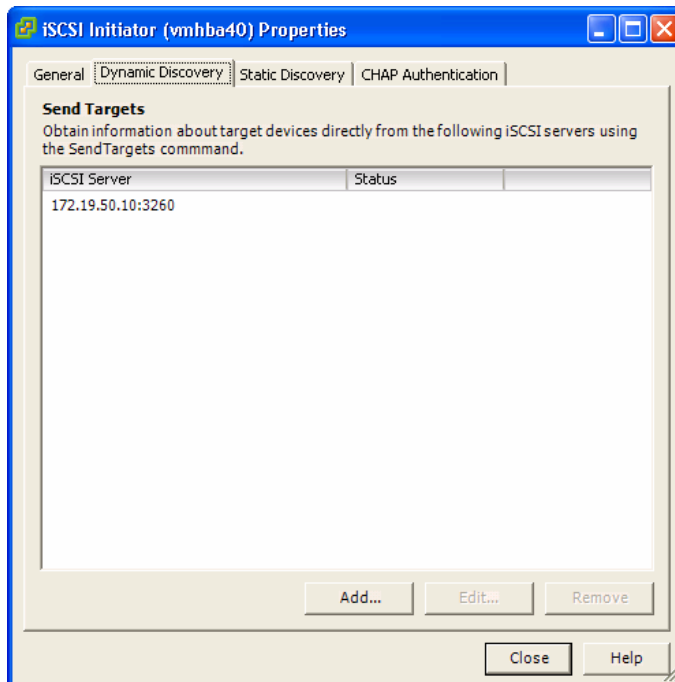
- When you enabled the Software initiator, it did not open the iSCSI port on the firewall.

To see if this is the problem, go to the **Configuration** tab and select **Security** profile. Scroll down and look for “*Software iSCSI Client*” and select the check box. Click **OK**.



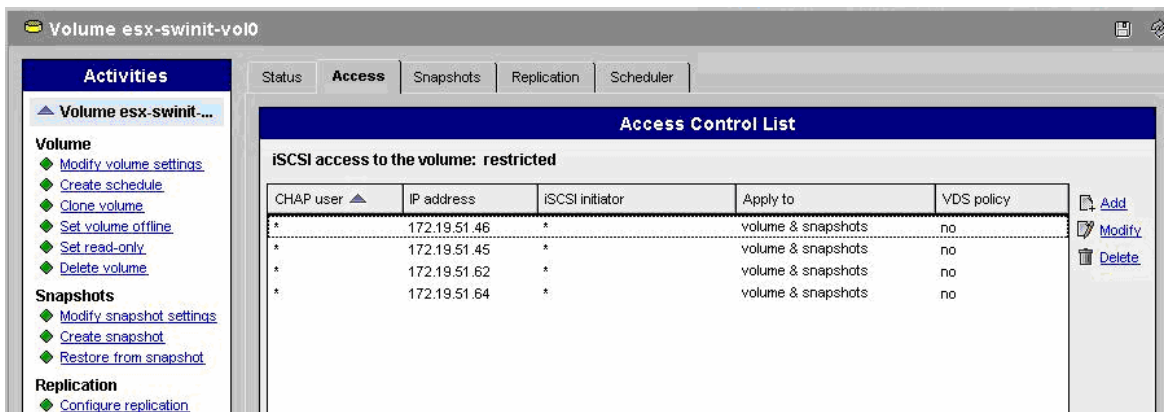
- The discovery address has not been set.
 1. Go to the **Configuration** tab and select **Storage Adapters**
 2. Select the software initiator and select **Properties**

3. Select the Dynamic Discovery tab. The IP address of the array should be displayed. If not add it and try rescanning the storage adapters.



- The Access control for that volume doesn't include both the service console IP address and VMkernel IP address.

The iSCSI Discovery process for the Software initiator is done via the Service console port. The iSCSI session connection is done via the VMkernel network. Both networks must exist and must have access to the volume for VMotion, HA, and DRS to work with the volume.



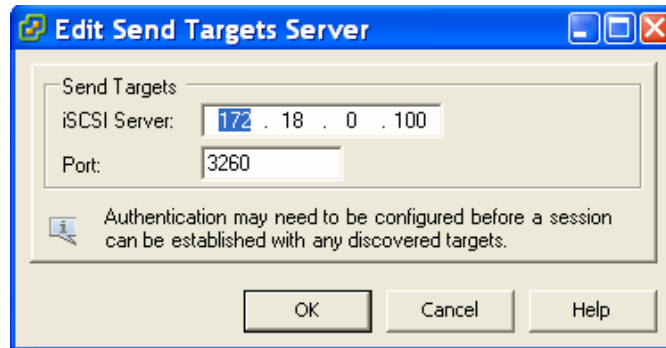
NOTE: In this example, the software initiators and the service consoles for each node have access to this volume. This allows VMotion, HA and DRS to function with this volume.

The software initiator doesn't see new volumes or snapshots

The software iSCSI initiator doesn't always discover new targets. There are a few workarounds:

- Try rescanning for volumes several times.

- Go to the Software initiator properties and edit the Dynamic Discovery address, but do not change a value. Click the address then **OK**. Then click **Close**. **Rescan** several times.



- Apply the hangup signal (HUP) to the vmkiscsid daemon.

NOTE: Only use the HUP signal with vmkiscsid. Any other signal, i.e. kill -9 can result in the iSCSI daemon crashing or hanging.

 1. Log in to the ESX server as root, using the console or an SSH client.

#killall -HUP vmkiscsid
 2. Return to the Storage menu. Select 'Rescan' and see if the volume is now seen. If not, rescan a few more times.

NOTE: Executing this command will not affect established iSCSI connections.

Volumes or snapshots STILL don't show up. What now?

On rare occasions we've observed that the /etc/vmkiscsi.conf file does not contain the discovery address. If so, edit the /etc/vmkiscsi.conf file and add:

DiscoveryAddress=<Group IP address>:3260

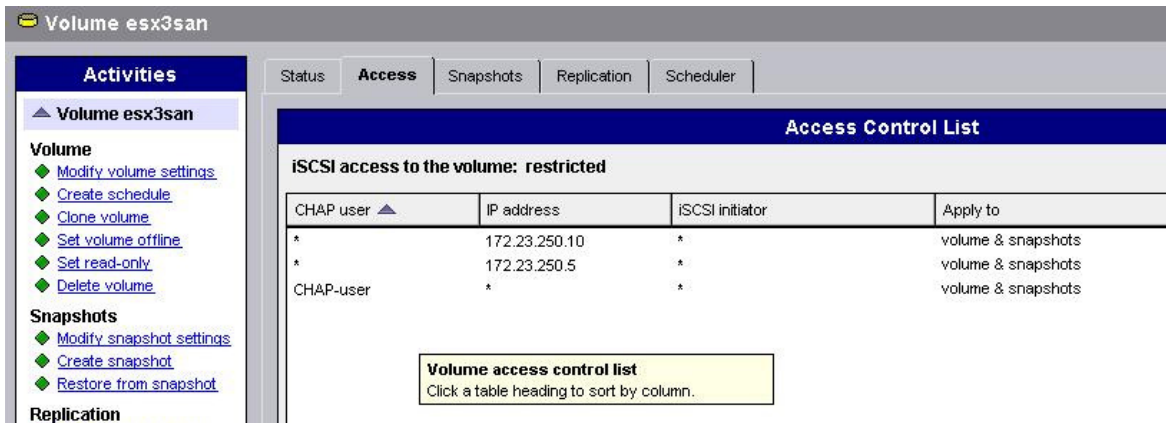
For example, if the Group IP address is 172.19.50.50, the command would look like this:

DiscoveryAddress=172.19.50.50:3260

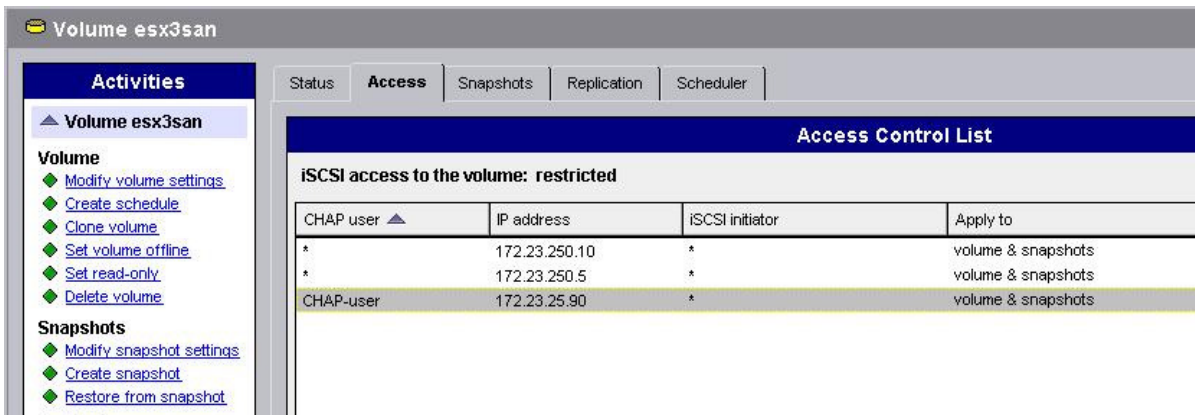
Reboot the ESX server, then try rescanning for new storage.

The ESX Server hangs when you enable the Software iSCSI initiator

If you have CHAP enabled on existing volumes with no IP/IQN name restriction, the VMware Software iSCSI initiator will constantly attempt to log in to those volumes. Check the Access configuration on all volumes using CHAP.



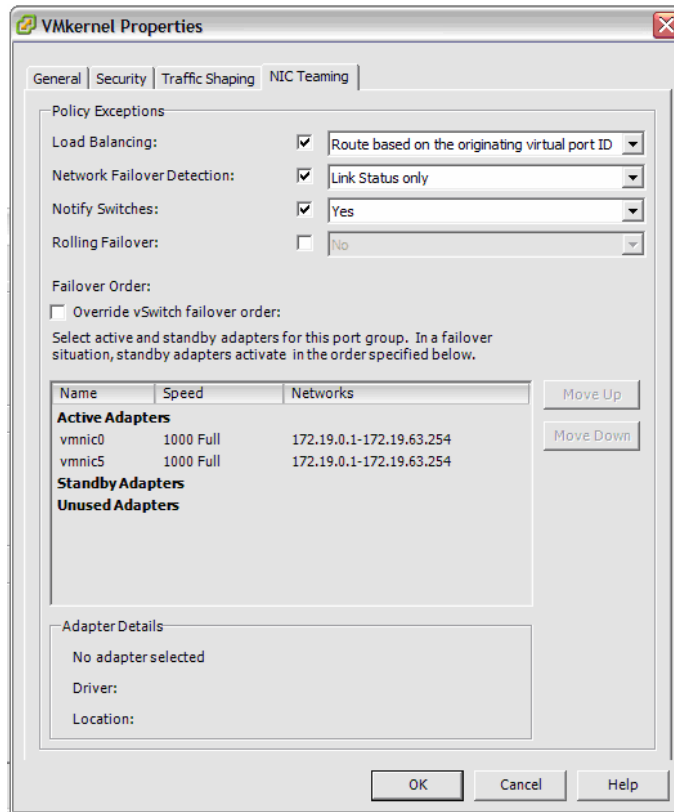
In this example, the CHAP user entry above allows any IP address to discover the volume. However, if the VMware server isn't configured properly for CHAP it will constantly attempt to log in to that target. With multiple volumes configured this way it ties up the VMware ESX server indefinitely.



To correct this, add an IP address or iSCSI initiator name to the CHAP Access Control record. Restart the ESX server and the problem should be resolved.

How do I establish multiple iSCSI sessions to the array?

You will need to create multiple volumes on the EQL array. Then use the NIC teaming feature to utilize multiple NICs on your VMkernel switch. This will establish a unique connection for each volume, which the EQL array can then load balance. Go to Configuration -> Networking -> Properties. Edit the VMkernel switch. Select NIC Teaming. Enable Load Balancing.



VMware VMotion

The questions and answers in this section have to do with the use of VMotion.

I can't migrate a VM to a new host, whether the VM is powered up or down.

I get the message: "A general system error occurred: Unknown failure migrating from another host"

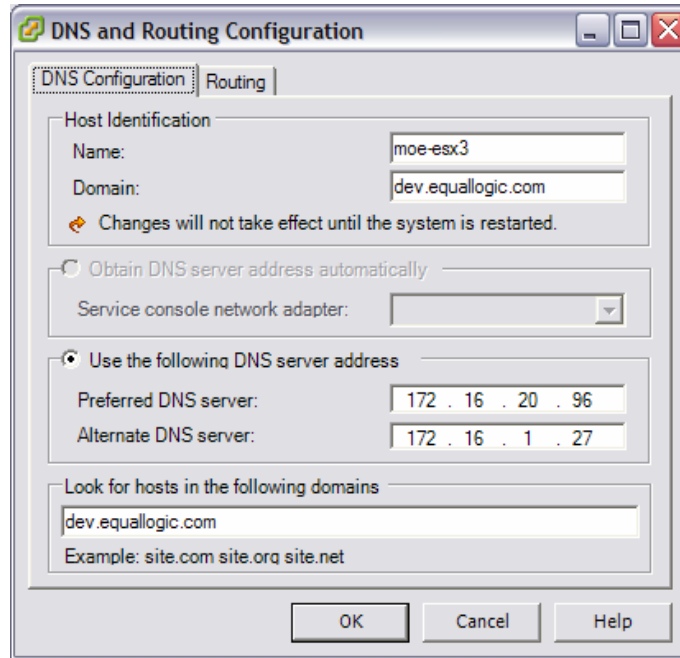
The screenshot shows the VMware vSphere interface with the 'Tasks & Events' tab selected. The 'View' dropdown is set to 'Tasks'. The task log table is as follows:

Name	Target	Status	Initiated by
Relocate Virtual Machine storage	VistaBeta2	Completed	Administrator
Reconfigure Virtual Machine	VistaBeta2	Completed	Administrator
Migrate Virtual Machine	VistaBeta2	A general system error occurred: Unknown failure migrating from another...	Administrator
Migrate Virtual Machine	VistaBeta2	A general system error occurred: Unknown failure migrating from another...	Administrator
Answer Virtual Machine Question	VistaBeta2	Completed	Administrator

NOTE: You should only use Static IP addresses when installing ESX, never use DHCP.

This problem can be caused by a number of issues. Here are some possible solutions:

- Check DNS Settings



- Add the name and IP address of the DNS server into the **/etc/hosts** file of each ESX server:

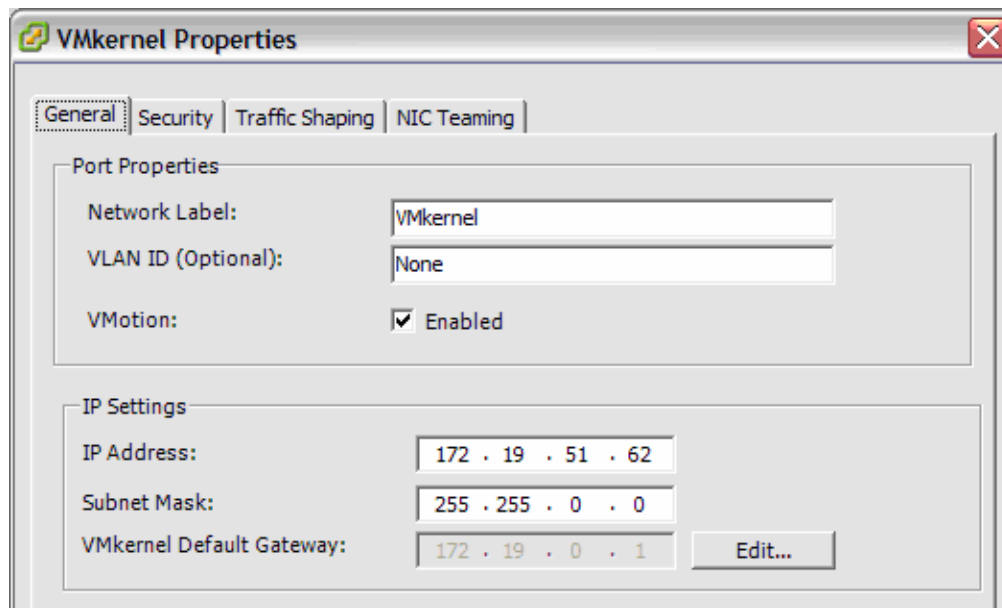
```
[root@esxbottom root]# cat /etc/hosts
```

```
127.0.0.1          localhost.localdomain localhost
```

```
172.16.25.100     esxbottom.selab.equallogic.com esxbottom
```

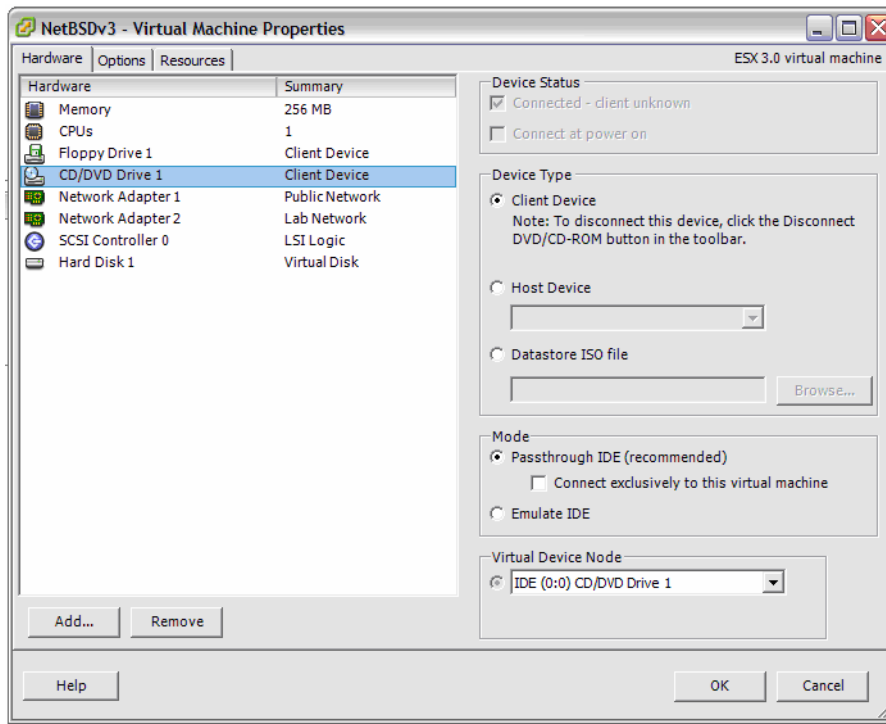
```
172.16.25.110     setop.selab.equallogic.com setop
```

- Confirm that the VMkernel Default Gateway is correctly set.



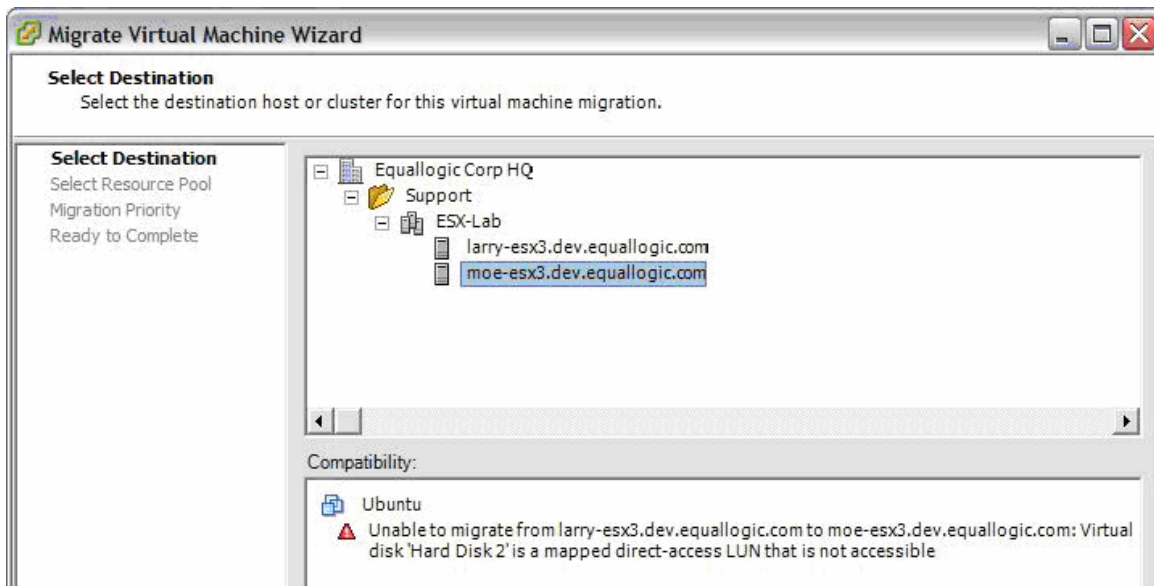
VMotion works when the VM is turned off, but not when it is powered on

With the VM powered off, check the CDROM settings in the VM configuration. Try setting it to **Client Device** and **Passthru** mode. Power up the VM and try again.

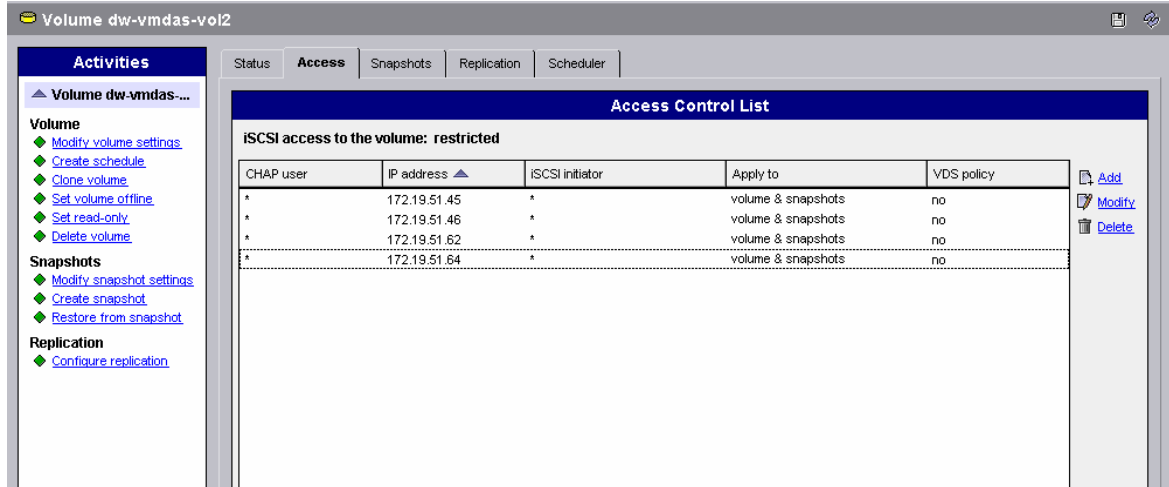


The System Can't VMotion with a Mapped SAN LUN

When you try to move a virtual machine that has a mapped direct-access LUN, the error message shown here appears:



- Make sure the ACL for the volume includes the server you're migrating to.



NOTE: In this example, the software initiator is being used. Each node needs an ACL entry for the Service console and the VMKernel Port.

Accessing VMware ESX Server

The questions and answers in this section have to do with getting access to the VMware ESX Server.

I can't SSH login to the root account on my VMware ESX server

By default, root is not allowed SSH access as allowing direct root access could compromise system security. The best practice is to create a non-root user account that you can use to login with SSH, then switch to the root user with the 'su -' command.

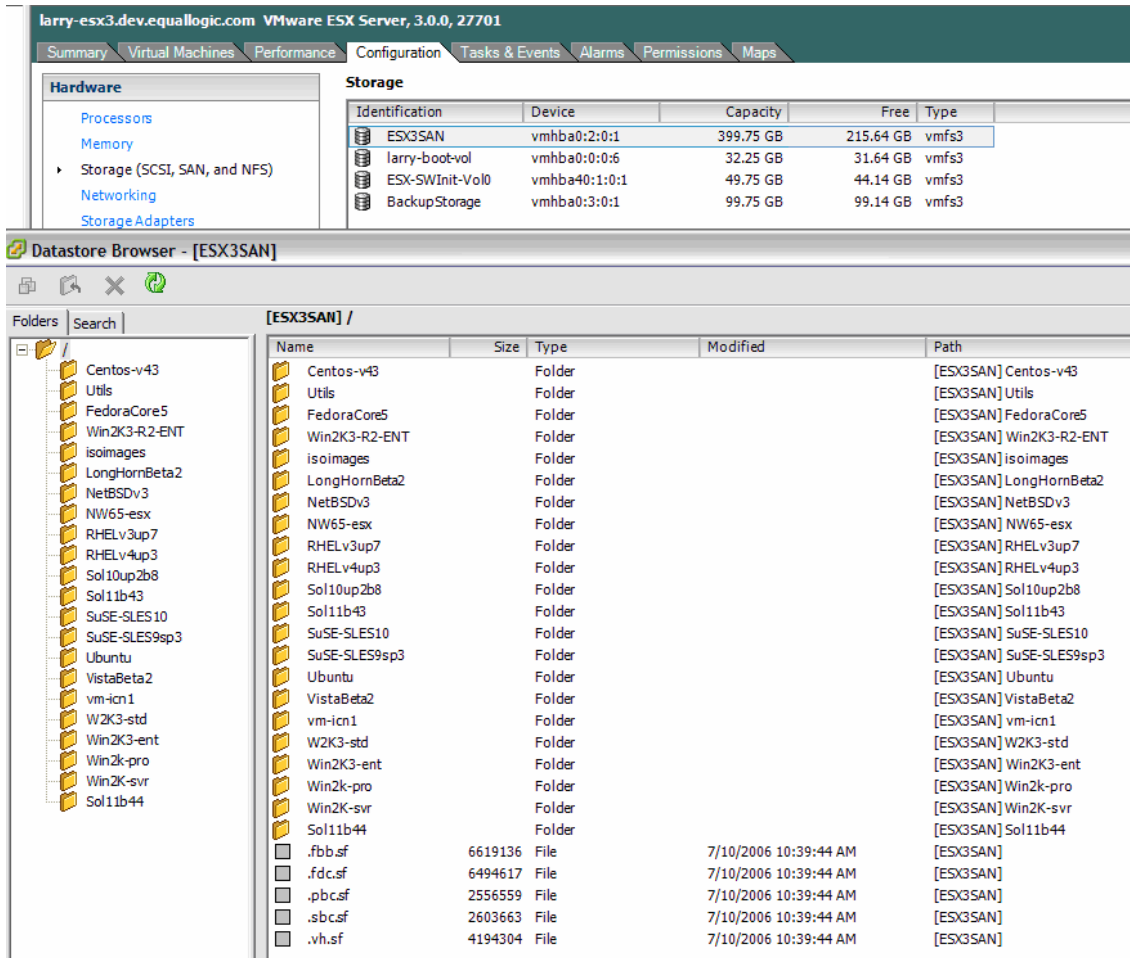
VMware Virtual Machines

The questions and answers in this section have to do with the use of virtual machines.

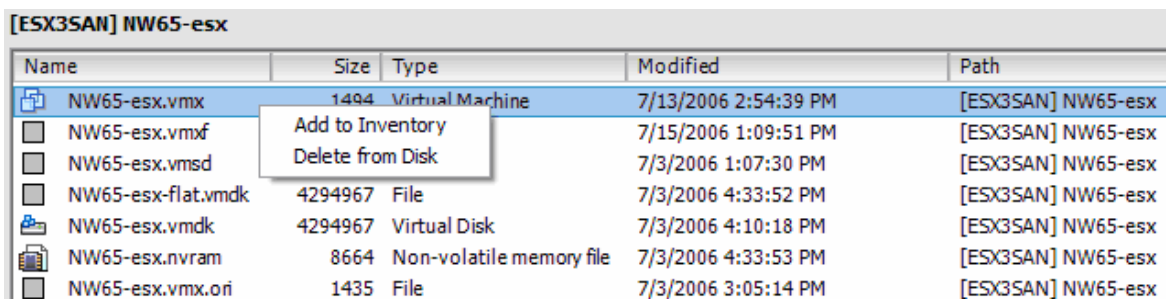
I don't know how to get my VM images into the inventory

Follow these steps to move a virtual machine image into the inventory:

1. Go to the **Configuration Tab** and select **Storage**.
2. Select the volume where the VM images are stored. Right-click that volume and in the shortcut menu that appears, select **Browse Datastore...**



3. Double-click the directory folder containing the VM you wish you register.
4. Right-click the .vmx file for the virtual machine. In the shortcut menu that appears, select **Add to inventory**. The virtual machine will now be available as part of the inventory.



Follow these steps to create a non-root user account that you can use to log in to the server with SSH:

1. Using the Virtual Center Client, log in to the ESX server as root.
2. Click the **Users & Groups** tab.

3. Right-click the Users & Groups page. In the shortcut menu that appears, select **Add**.
4. Create the new user. Ensure that the **Grant shell access to this user** checkbox is selected.

NOTE: ESX server includes the ‘adduser’ utility, which you can use to create a non-root user. Run **man adduser** for help with the adduser command.

An alternate approach is to edit the /etc/ssh/sshd_config file to allow root login access. Follow these steps to do this:

1. Look for the line that says, “#PermitRootLogin yes”
2. Remove the # sign and save the file.
3. Restart the SSH daemon using the command:
#service sshd restart

I can't login as root with Putty after editing the sshd_config file

By default, Putty sends passwords in clear text. By default, the SSH daemon doesn't support this. Follow these steps to allow Putty access:

1. Edit the /etc/ssh/sshd_config file.
2. Find the line that says “#PasswordAuthentication yes”
3. Remove the # sign.
4. Restart the SSH daemon with the command
#service sshd restart.

Putty should now work.

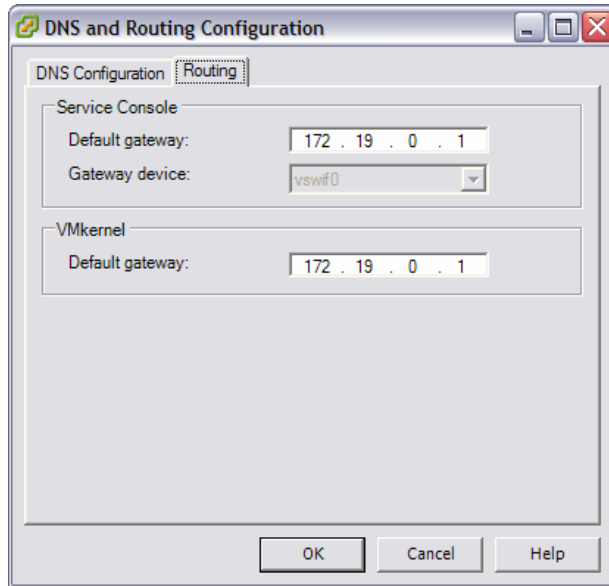
VMware Kernel

The questions and answers in this section have to do with the VMware Kernel.

When I create a VMKernel network it asks to set the default gateway.

I already have a default gateway defined. What do I use here?

The answer depends on your network infrastructure. Typically, it is the same as the Console Gateway.



VMware Miscellaneous Issues

The questions and answers in this section have to do with miscellaneous VMware issues that do not fit into any of the other categories.

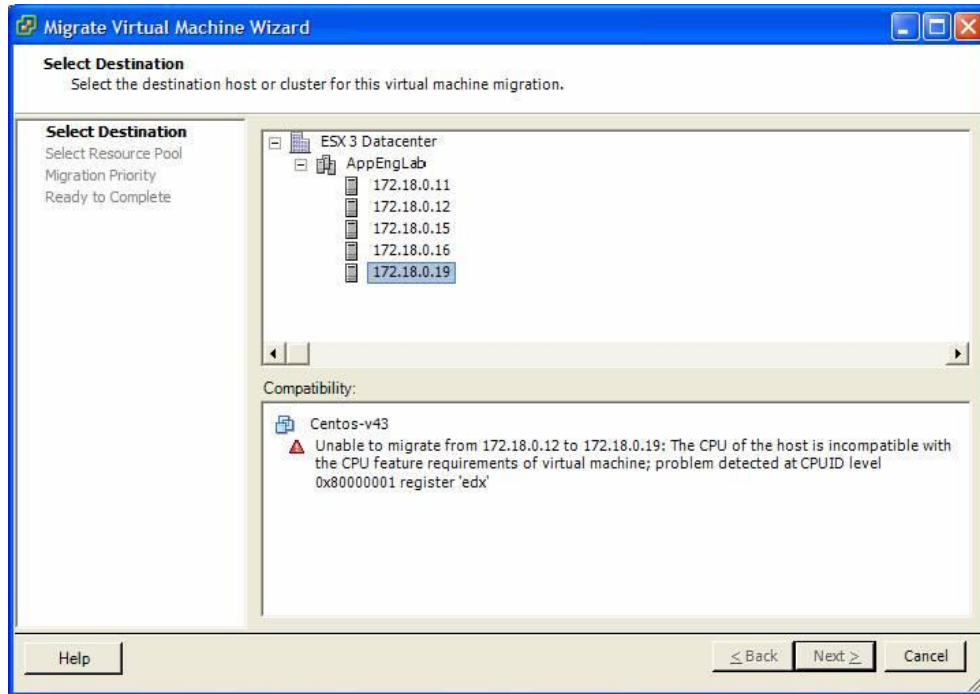
FYI: An ESX Server FQN can't be longer than 29 characters

Longer hostnames causes a memory leak. For example, the fully qualified host name esx3server01.internal.equallogic.com is too long.

This is expected to be addressed in v3.0.1

I get a "CPU incompatible" error when migrating a running VM

The processor in the destination server is not at the same generation as the source server or is from a different vendor. Migrating the running virtual machine to the destination server could cause the virtual machine to crash.



Workarounds: One way to deal with this problem is to ensure that each cluster uses servers with the same hardware. The second way to deal with this is to remove the “odd” server from the cluster and run it standalone.

Visit the VMware knowledge base for more information.

http://kb.vmware.com/vmtknk/search.do?cmd=displayKC&docType=kc&externalId=1377&sliceId=SAL_Public&dialogID=112540&statId=0%20%20114524&doctag=Author,%20

I get a “Failed to serialize results” message when checking Storage Properties

Try disabling CHAP on the VMware software initiator and on the EQL array access control for all volumes. Restrict access by IP address instead.

My VM enters an infinite abort loop when all paths to a LUN are no longer accessible

When all paths to a LUN are no longer accessible and a virtual machine is undergoing heavy I/O, the virtual machine goes into an abort loop. The virtual machine is non-responsive. This is a known issue that will be fixed in VMware ESX Server 3.0.1.

To work around this problem, reboot the virtual machine.

My ESX Server has become sluggish and unresponsive

When the ESX Server is under heavy load from iSCSI or NFS backed virtual machine storage, the server may become sluggish or unresponsive for periods of time.

Workaround: Login in as root and run the following command, then reboot:

```
#esxcfg-advcfg -k 16777216 netPktHeapMinSize
```

Network connectivity lost when a network leaks undesirable packets

When you use a network adapter without scatter or gather capability, a memory leak exists that can lead to the loss of network connectivity.

The message:

WARNING: Uplink: 1925: Couldn't allocate pkt for frame copy, appears in the log.

To the best of our knowledge, the following cards are vulnerable to this problem:

- e1000 with pci id 0x1000
- e100 with pci *rev* ID less than 0x0c (that is 4, 5, 8, 9)
- Some Broadcom5700 network adapters

To work around this issue:

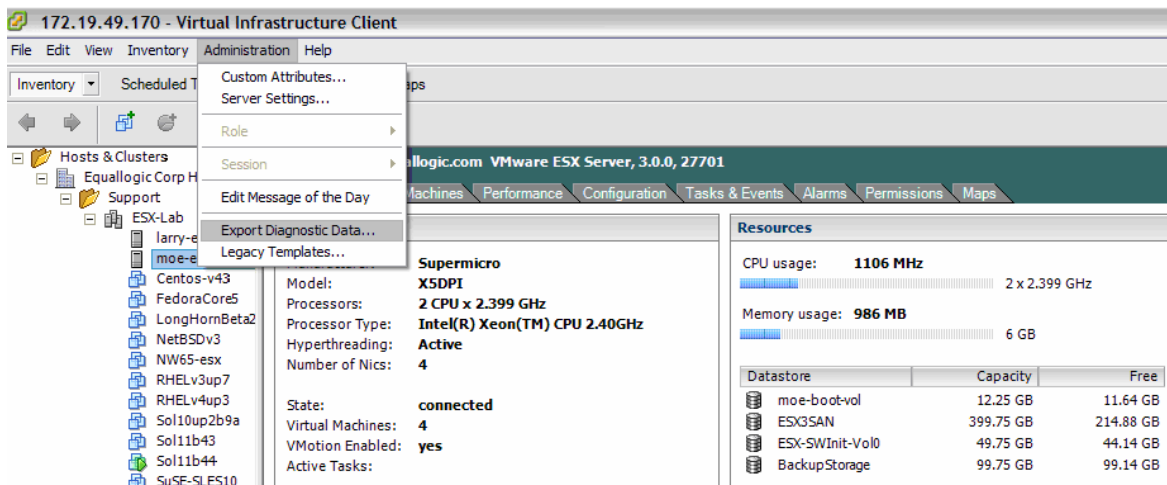
1. Use the following command to increase the heap size:

```
#esxcfg-advcfg -k 16777216 netPktHeapMinSize
```
2. Reboot the system.

How do I gather Diagnostic Data?

Follow these steps to gather diagnostic data:

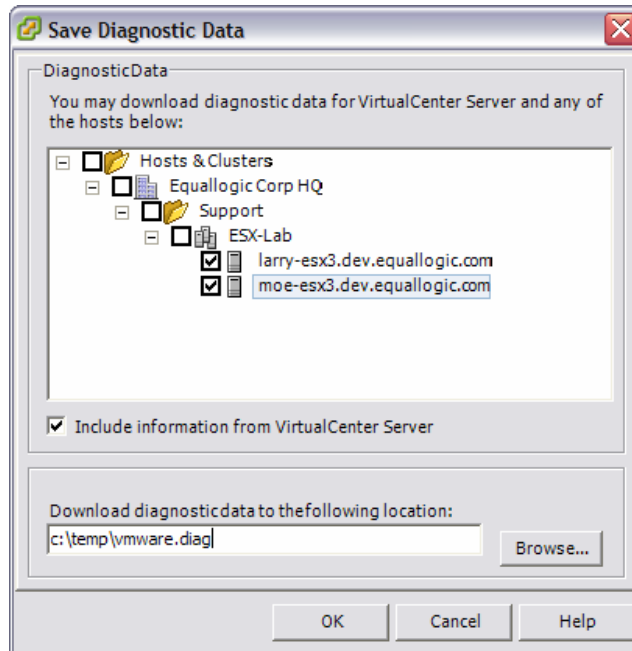
1. Go to the Administration Menu and Select **Export Diagnostic Data**.



The screenshot shows the VMware vSphere Client interface. The 'Administration' menu is open, and 'Export Diagnostic Data...' is highlighted. The background shows the 'Resources' tab for a host, displaying CPU usage at 1106 MHz and memory usage at 986 MB. A table of datastore information is also visible.

Datastore	Capacity	Free
moe-boot-vol	12.25 GB	11.64 GB
ESX3SAN	399.75 GB	214.88 GB
ESX-SWInit-Vol0	49.75 GB	44.14 GB
BackupStorage	99.75 GB	99.14 GB

2. Select the servers to gather the report, the filename and where to save the files.



Non-VMware Questions

The questions and answers in this section have to do with non-VMware products that interact with VMware.

QLogic iSCSI HBAs

NOTE: The QLogic 4010 iSCSI HBA is considered experimental by VMware at this time. VMware only offers limited support for this card.

References:

http://www.vmware.com/pdf/vi3_io_guide.pdf

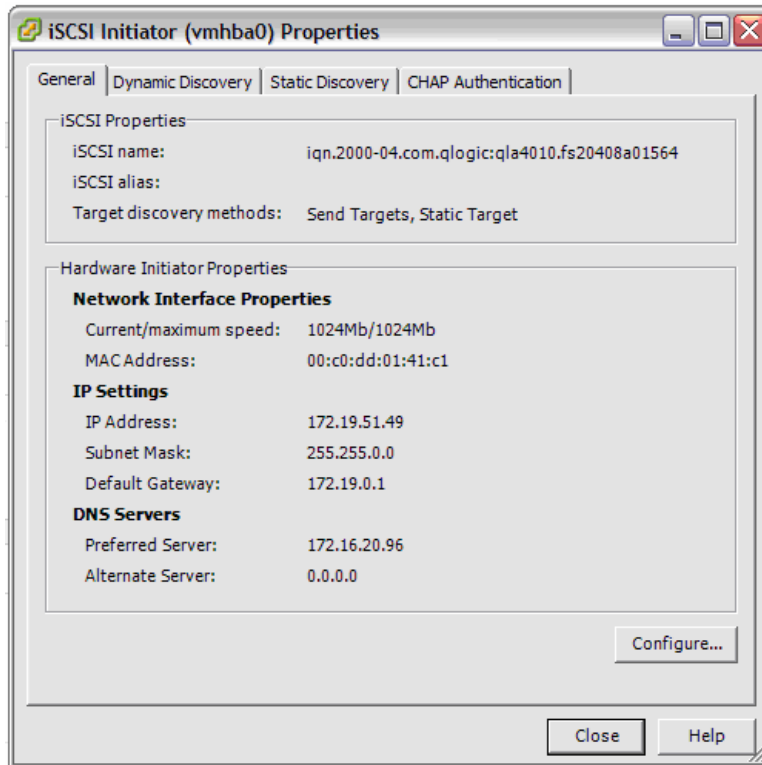
http://pubs.vmware.com/vi3/serverconfig/wwhelp/wwhtml/common/html/wwhelp.htm?context=serverconfig&file=sc_storage.10.14.html

http://www.vmware.com/support/vi3/doc/releasenotes_vi3.html

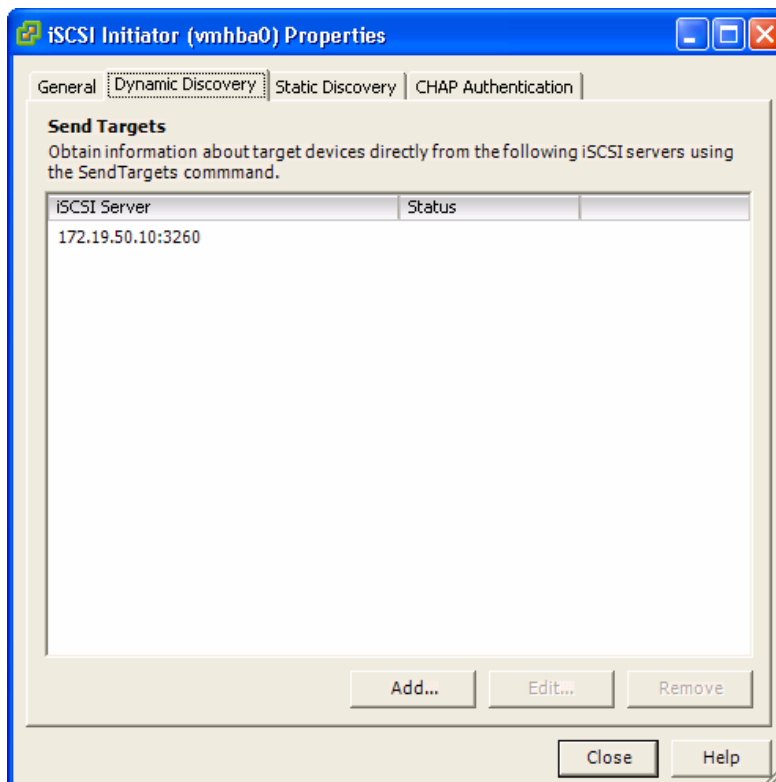
I've booted from SAN but I can't see other volumes on the Qlogic iSCSI HBA

Verify that the Discovery address is set on that adapter.

3. Go to the Configuration Tab and select **Storage Adapters**.
4. Select the **QLA4010 Storage Adapter (vmhba0)** and then **Properties**.



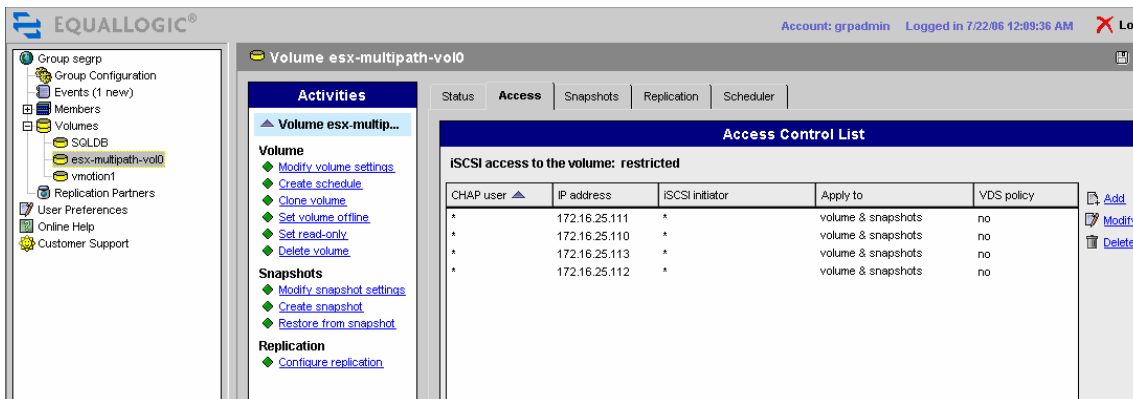
- Select the **Dynamic Discovery** Tab and make sure the Group IP address of the array is there. If not, add it and click **Close** to save it.
- Try rescanning the storage adapter. The volume(s) should now be visible.



How do I configure Multipath Support with the QLogic 4010 iSCSI HBA?

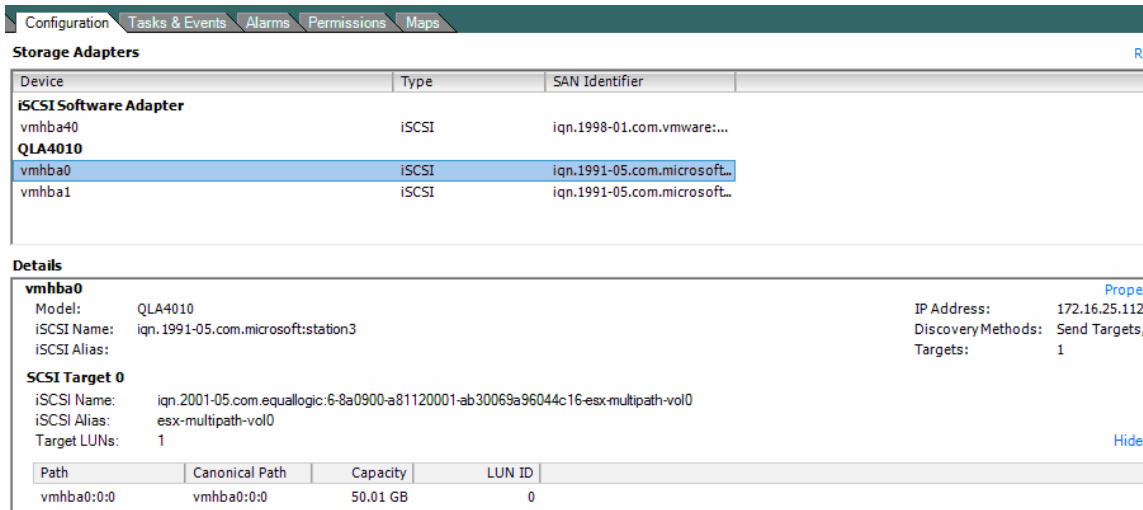
Follow these steps to configure multipath support (MPIO) for the QLogic 4010:

1. Make sure the array volume allows both iSCSI HBAs to have access.

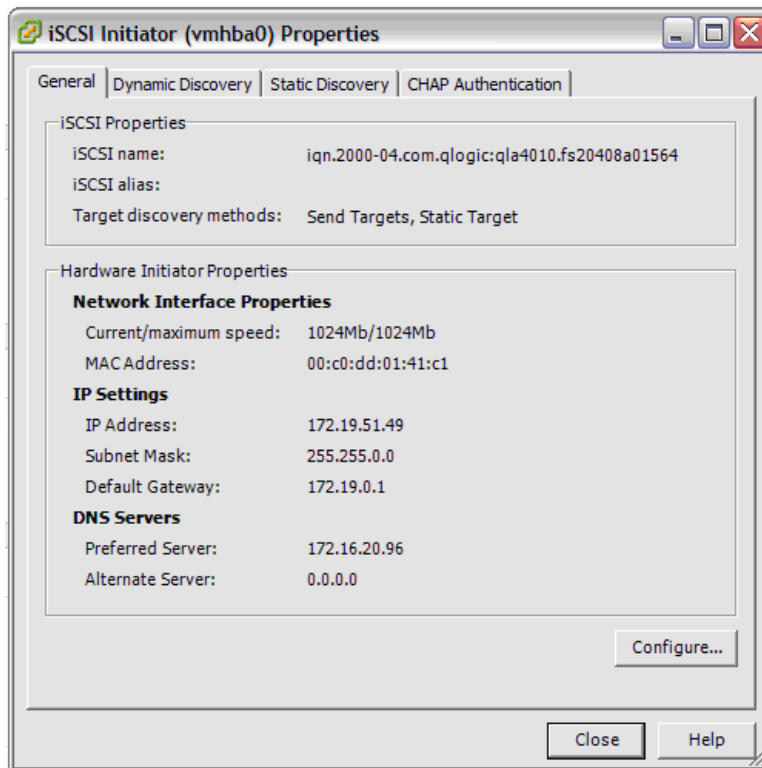


NOTE: In this example there are four IP's in the access list. Two for the iSCSI HBAs and two for the software iSCSI initiator in the other node to enable VMotion support.

2. Go to **Configuration**, select **Storage Adapters**, then **Properties**.
3. Make sure each iSCSI HBA can discover the volume.



4. Add the storage into the system and format as VMFSv3 (if required)
5. Go to **Configuration**, select **Storage** then click **Properties**. You should see both iSCSI adapters, one as Active and one Standby.
6. Click the **Manage Paths** button to see which HBA is the preferred path.



Are there any tuning parameters for the QLogic to increase throughput?

QLogic has a firmware setting called Execution Throttle. This sets the maximum number of simultaneous commands the adapter will send out. The default is typically 64, with a maximum of 256. QLogic support tells customers to set it to MAX. However, this could cause contention issues on the SAN. Informal testing has shown improvement up to 128 but little difference above that. Some experimentation may be required to determine the optimal setting in your environment.

NOTE If you are booting from SAN, you will have to reboot the host for the change to take effect.

EqualLogic Snapshots

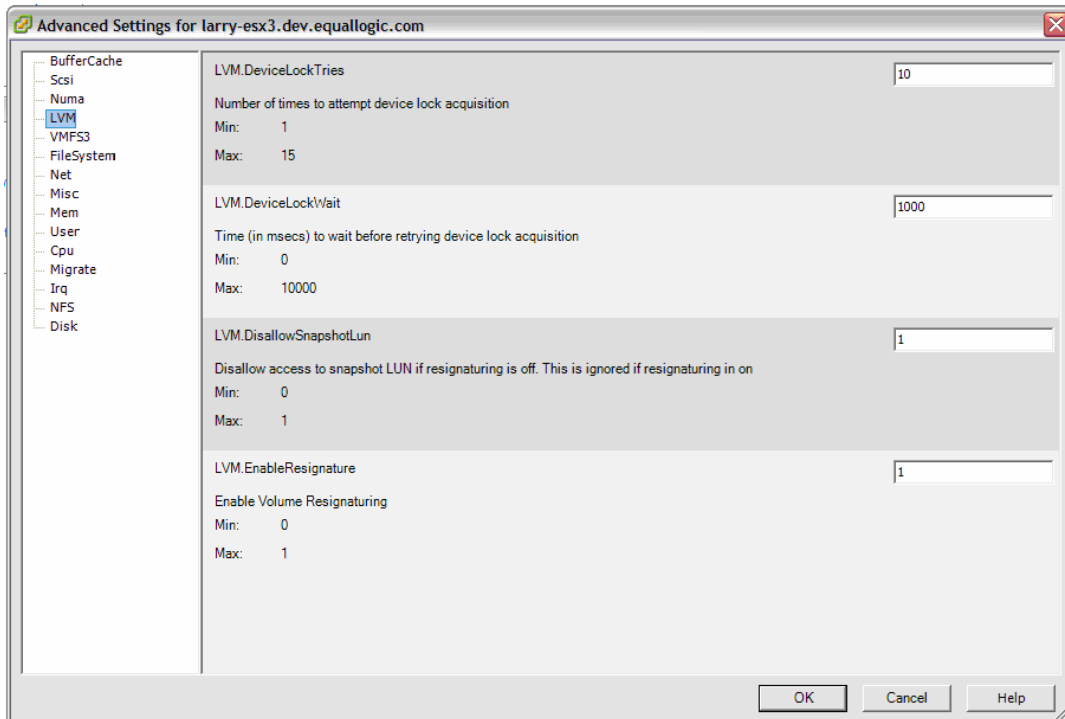
The questions and answers in this section have to do with snapshots.

VMware wants to format snapshots, replicas, and clones

To prevent this, you have to enable the *LVM.EnableResignature* parameter. If the VMware ESX Server sees that a volume already has a VMFS signature that matches an existing volume, it treats the volume as new and asks you to format it. If you set *LVM.EnableResignature*, the ESX server gives you access. You have to set this parameter for every ESX server where you want to mount snapshots, promoted replicas or clones.

Follow these steps to set *LVM.EnableResignature*:

1. From the **Configuration Tab** of the ESX server, select **Advanced Settings**.



2. Select **LVM** on the menu on the left. In the information pane you will see LVM.EnableResignature field. The default setting is 0. Change the setting to 1.
3. Now when you scan for new storage, it should see the snapshot, promoted replica, or clone as a pre-existing VMFS volume and mount it.

Microsoft Clustering Service

The questions and answers in this section have to do with the Microsoft Clustering Service.

Can Microsoft Clustering Service (MSCS) in W2K3 (SP1) use VMDK disks?

Windows 2003 (SP1) introduced a change that resulted in MSCS clusters not functioning in any ESX Server version. VMware is working with Microsoft support to resolve the issue.

Workaround: Use the MS iSCSI initiator and put the Quorum and Cluster volumes outside of VMware, directly on the EqualLogic array. This also allows the full range of the PS Series Array features (replication, snapshots of individual volumes, VSS for backups, etc.).

NOTE: Windows 2000 and its service packs, and Windows 2003 RTM continue to function in ESX Server virtual machines.