



Training with Celerra[®] Simulator

EMC Proven[™] Professional 2008

Andy Harrington
Regional Network Specialist
EMC Corporation
harrington_andy@emc.com

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Celerra Network Server 5.5 Command Reference Manual

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Introduction

This article will detail the training aids that are available to increase knowledge. I've been an EMC employee for a little more than two years. I came to EMC with a network background but not NAS; which is what I was hired to do. I am also a subject matter expert in EMC's remote access product, ESRS (EMC Secure Remote Support Gateway). Due to customers' need to have increased security in their environments, as well as the costs associated with having modems, I have been very busy with ESRS.

That said, I have always participated in NAS-related activities. This has been difficult at times. However, I was able to solve this problem by installing VMware in the Newton RDC. The lab consists of a Dell 1850 Workstation with an 80GB hard drive and 1GB of RAM. This server was and is still used as a platform for ESRS; this enables us to test configuring devices as well as remotely accessing devices.

VMware consists of VMware Server Console. Within this, I have an instance of Windows 2003; this is being used as the testing platform for this article. I created an Active Domain as part of this. There are two instances of Celerra[®] simulator based on 5.5.29 code; both have separate IP addresses. Only one is being used for this exercise. The Celerra simulator enables me to run most Celerra-related commands. The product is based on the CLARiiON platform, but I can't run navicli commands.

Why CIFS and iSCSI? Well, both need detailed configurations to function properly. The Celerra has to be setup with LUNs and filesystems, etc. as well as Windows hosts being configured with the iSCSI initiator or the mapping of a CIFS share. You also need to ensure that there is network connectivity between source and destination.

That being said, there was quite a bit of trial and error before the finished product was ready. I had experience troubleshooting both CIFS and iSCSI issues, but I had not configured them from start to finish. This has been crucial, as I am now able to setup and troubleshoot both environments. Luckily, EMC has a lot of excellent documentation to rely on.

Going forward, I can see VMware and Celerra simulators being utilized for various training purposes. With two instances of Celerra simulator, I plan to set up replication between both sides. With time zones being an issue, I have already tested modifying GMT/EST time zones on control stations and data movers. I hope that Corporate will come out with an upgrade to NAS code 5.6. Also, there is Rainfinity hardware in the Newton RDC. I plan to configure this to connect to both simulators and then move data using Rainfinity. I am considering other ideas such as data migrations and configuring MPFS.

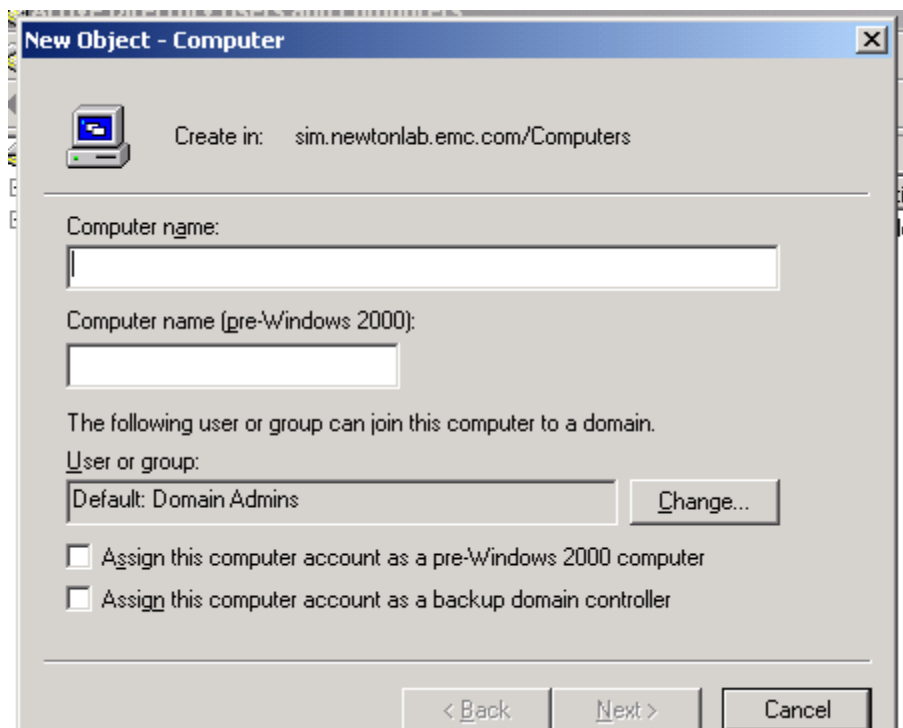
Finally, I want to thank JM for hiring me and JG for being a great boss!

INFORMATION FOR SYSTEM ACCESS

The windows system used for this exercise can be reached with Remote Desktop at 10.5.25.48. The username/password are Administrator/cqcqqrw. The windows 2003 VMware instance also has the same username/password. The Celerra simulator VMware instance can be reached at 10.5.25.228. It can be accessed with putty or Celerra manager at the same IP address. The password for both nasadmin and root is fcbde08.

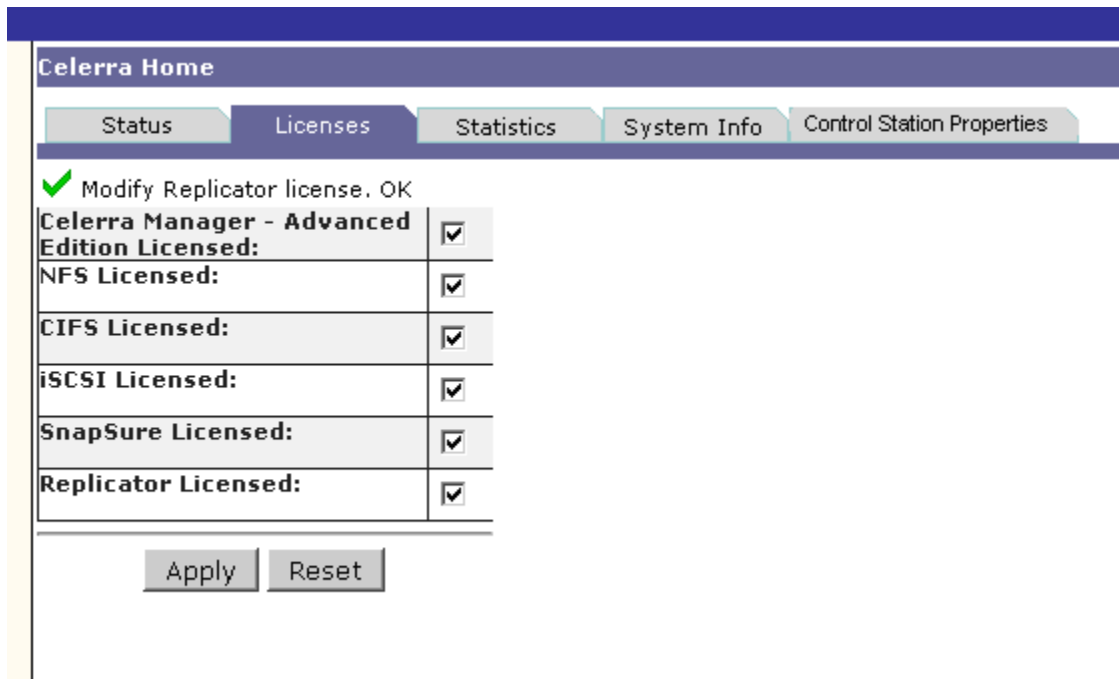
How to Create a CIFS Server

1. The first step is to create a computer account on the Windows server that the CIFS server will connect to (it will be assumed that you are logging into the windows server as Administrator).
2. Select the Computers Folder.
3. Right click on the folder and select New/Computer.



4. Type the desired Computer Name, select next twice and then finish.

5. Verify that the CIFS license is enabled on the Celerra.



6. Verify that CIFS is started.

```
nasadmin@localhost:~  
[nasadmin@localhost nasadmin]$ server_cifs server_2  
server_2 :  
Cifs NOT started  
Security mode = NT  
Max protocol = NT1  
I18N mode = ASCII  
Home Directory Shares DISABLED  
  
Enabled interfaces: (All interfaces are enabled)  
Disabled interfaces: (No interface disabled)  
  
[nasadmin@localhost nasadmin]$
```

7. If CIFS is not started, it will say CIFS NOT started at the top of the output.
8. If not already started, this is how CIFS can be started manually and verified:

```

[nasadmin@localhost ~]
[nasadmin@localhost nasadmin]$ server_setup server_2 -P cifs -o start
server_2 : done
[nasadmin@localhost nasadmin]$ server_cifs server_2
server_2 :
256 Cifs threads started
Security mode = NT
Max protocol = NT1
I18N mode = ASCII
Home Directory Shares DISABLED
Usermapper auto broadcast enabled

Usermapper[0] = [127.0.0.1] state:active (auto discovered)

Enabled interfaces: (All interfaces are enabled)

Disabled interfaces: (No interface disabled)

[nasadmin@localhost nasadmin]$ █

```

9. Create the interface that CIFS will use.
10. Login into Celerra Manager.
11. Select Data Movers/Server_2/Network.

The screenshot shows the Celerra Manager interface. On the left, a tree view shows the hierarchy: 10.5.25.228 > Data Movers > server_2 > Network. The main panel is titled 'Interfaces' and shows configuration options for 'server_2'. Below these options is a table of network interfaces.

Address	Name	Netmask	Data Mover	Device	Status
127.0.0.1	loop	255.0.0.0	server_2	loop	Up
192.168.1.2	el30	255.255.255.0	server_2	el30	Up
192.168.2.2	el31	255.255.255.0	server_2	el31	Up

12. Select the New button.

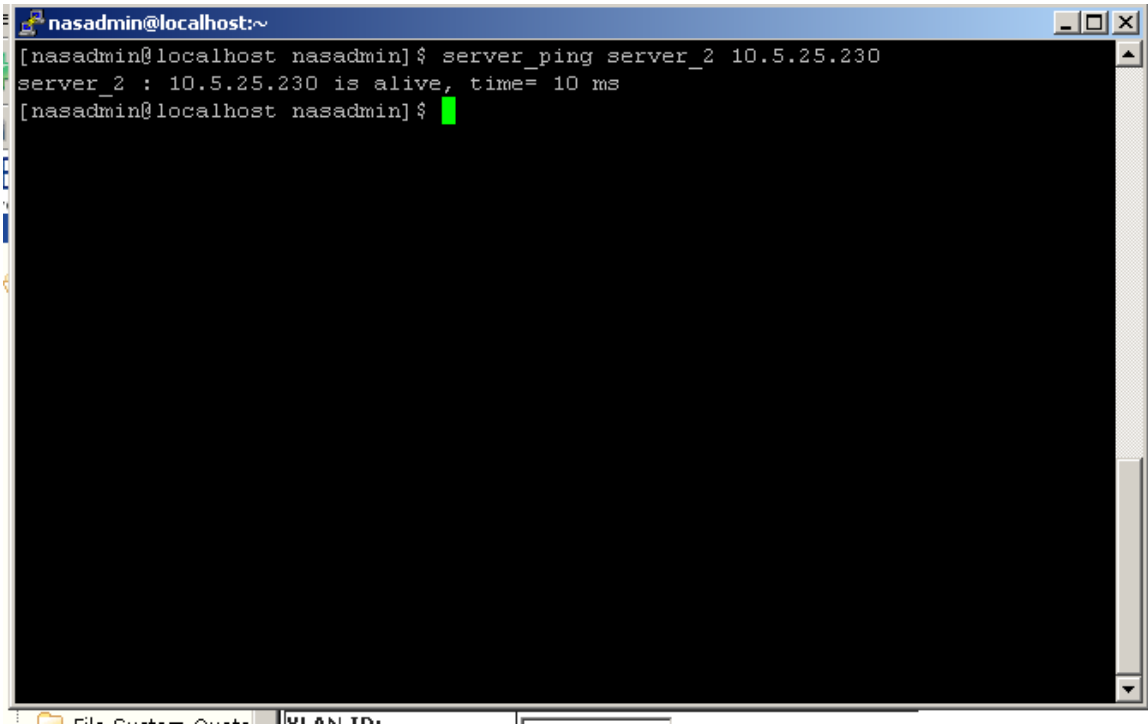
13. On the New Network Interface screen, select the device, type in the address, then type in a name for the interface. If you leave it blank, the default will be the name of the device. Make sure the netmask is 255.255.255.0. This would depend on the customer, but a class C mask is normal.

New Network Interface	
Data Mover:	server_2
Device Name:	cge0
Address:	10.5.25.230
Name:	cifs (Optional)
Netmask:	255.0.0.0
Broadcast Address:	10.255.255.255
MTU:	(Optional)
VLAN ID:	(Optional)

OK Back Apply

14. Verify that you can ping the IP address from the data mover: server_ping server_2 x.x.x.x. The return you receive should say it's alive.

(See illustration on following page)

A terminal window titled 'nasadmin@localhost:~' with standard window controls. The prompt is '[nasadmin@localhost nasadmin]\$. The command 'server_ping server_2 10.5.25.230' has been entered and executed. The output is 'server_2 : 10.5.25.230 is alive, time= 10 ms'. The prompt is now '[nasadmin@localhost nasadmin]\$' with a green cursor.

```
[nasadmin@localhost nasadmin]$ server_ping server_2 10.5.25.230
server_2 : 10.5.25.230 is alive, time= 10 ms
[nasadmin@localhost nasadmin]$
```

15. Create the CIFS server thru Celerra Manager.
16. Select Data Movers/Server_2/CIFS/CIFS Servers/New.
17. Fill out fields: Server Type-Windows 2000/2003, Windows 2000 Computer Name (this is the Machine Name you added on the windows server), Domain (sim.newtonlab.emc.com), click in the Join Domain box. Use the domain administrator's username/password. Click in the box for the appropriate interface.

(Illustration follows)

Server Type:	<input type="radio"/> Windows NT4 <input checked="" type="radio"/> Windows 2000/2003 <input type="radio"/> Standalone
Windows 2000 Computer Name:	cifs
Aliases:	(Optional)
NetBIOS Name:	(Optional)
Domain:	rain.newtonrdc.emc.co
Join the domain:	<input checked="" type="checkbox"/>
Domain Admin User Name:	Administrator
Domain Admin Password:	*****
Organizational Unit:	Computers:EMC Celerra
Enable local users:	<input type="checkbox"/>
Set Local Admin Password:	
Confirm Admin Password:	
Interfaces:	<input checked="" type="checkbox"/> 10.5.25.230

18. If you receive a message that the computer couldn't join the domain, look in the server log for the specific error: `server_log server_2 |tail -15`.
19. If the errors are dns related, verify dns settings at cli prompt: `server_dns server_2`.
20. If the service is stopped, start it by: `server_dns server_2 -o start`.
21. To add a dns server: `server_dns server_2 sim.newtonlab.emc.com 10.5.25.12`.
22. Attempt to join the domain again. The gui will give you a success message. You can also verify at cli prompt: `server_log server_2`. It will say Command succeeded: `domjoin ...`
23. If the server log shows an error that time skew is too great, compare time of windows domain and data mover. The join will not occur if they are more than 10 minutes apart. A fix would be to connect the datamover to an ntp server: `server_date server_2 timesvc start ntp 10.5.25.12`.

24. To create a CIFS share, select Data Movers/CIFS/CIFS Shares/New (it's assumed that you have a file system already created. We will not be creating one)
25. Select the data mover, type in a share name, select a file system, path (\name of filesystem), click in the box for the CIFS server you created, then select apply.

New CIFS Share root@1

✓ Create CIFS share cifs: on server_2:available from CIFS CIFS Server. OK

i If you do not select any specific CIFS servers, the share will be accessible from all defined CIFS servers. will be accessible only via the selected CIFS servers.

Choose Data Mover: server_2 ▼

CIFS Share Name: cifs

File System: cifs (\cifs) ▼

Path: \cifs

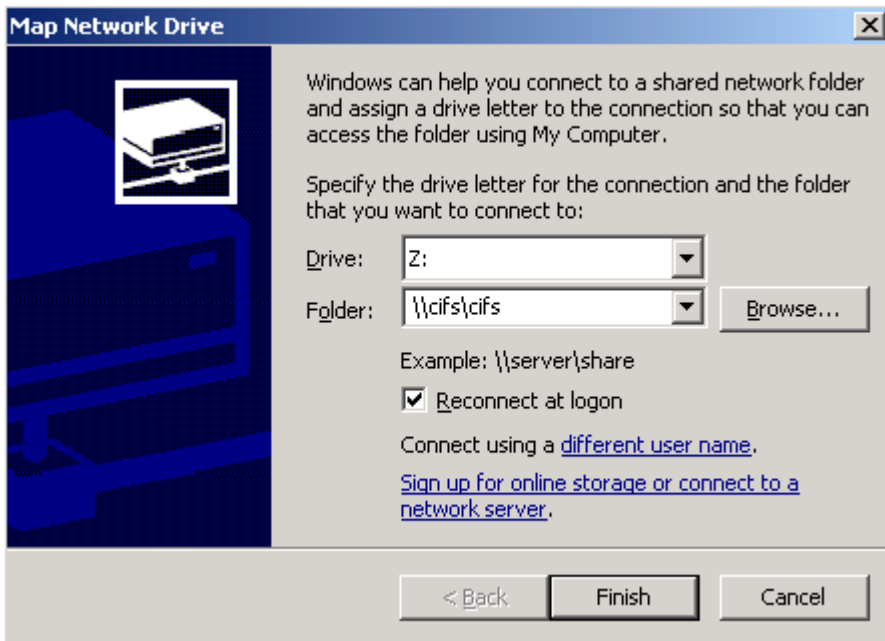
CIFS Servers: CIFS (Optional)

User Limit: (Optional)

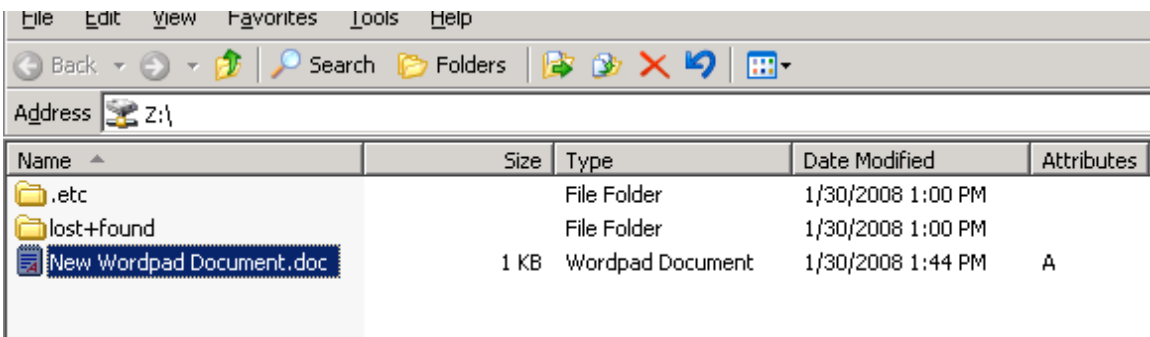
Comment: (Optional)

OK Back Apply

26. You should receive a message at the top of the screen that says the share creation was OK. There should also be an information message that says if you don't select the specific CIFS share, the share will be available from all CIFS servers. This is only for informational purposes.
27. Connect to the share. Ensure that computer that you are on is in the domain that you created (sim.newtonlab.emc.com domain) for example.
28. To connect to the share: Right click on the Start button and select explore, select Tools/Map Network Drive. Type in \\computer_name\share.



29. Verify that you can write to the share by either creating a new file or copying an existing file into the share. It is noticed that the .etc and lost+found directories are visible. According to EMC primus article emc17671, there are procedures for hiding these directories so that they aren't visible to users. This will not be done as part of this exercise. The purpose here is to create a CIFS server and write data to a share.

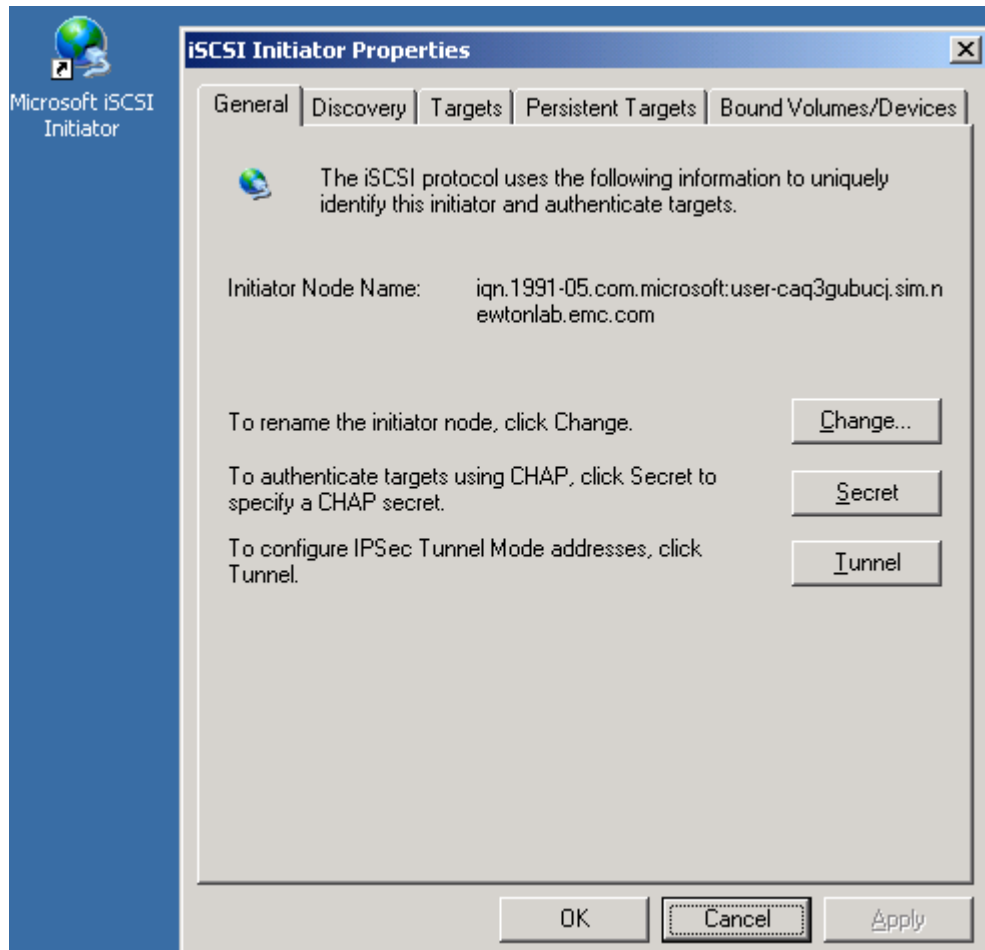


CIFS Troubleshooting

- Ensure that you have administrative access to the domain when creating the computer that the CIFS share will connect to.
- Verify that you can ping the interface after the interface is created, but before creating the CIFS server.
- When you've verified that you can ping the interface, verify that the data mover can ping the domain server that the computer was created on.
- Before joining the CIFS server to the domain, verify that you have the correct administrator username/password.
- In addition, verify that you have the proper domain. You only have to list the domain, not the host that the domain sits on.
- If the attempt at joining the domain is unsuccessful, verify server logs for specific error.
- If the error is time related (time sku, etc), verify that you've specified an ntp server: `server_date server_2 timesvc stats ntp`. You should check the time on datamover and domain server. They should not be more than 10 minutes apart.
- If the error is dns related, verify datamover dns settings: `server_dns server_2`. Ping dns server with `server_ping` to verify connectivity.
- To view CIFS server stats: `server_CIFS server_2`. You can see which domain you are attached to. Or maybe there are attachment issues. You can also view if the interface is enabled or disabled.
- To view interfaces and status (an important command if your CIFS server is having connection issues): `server_ifconfig server_2 -a`.

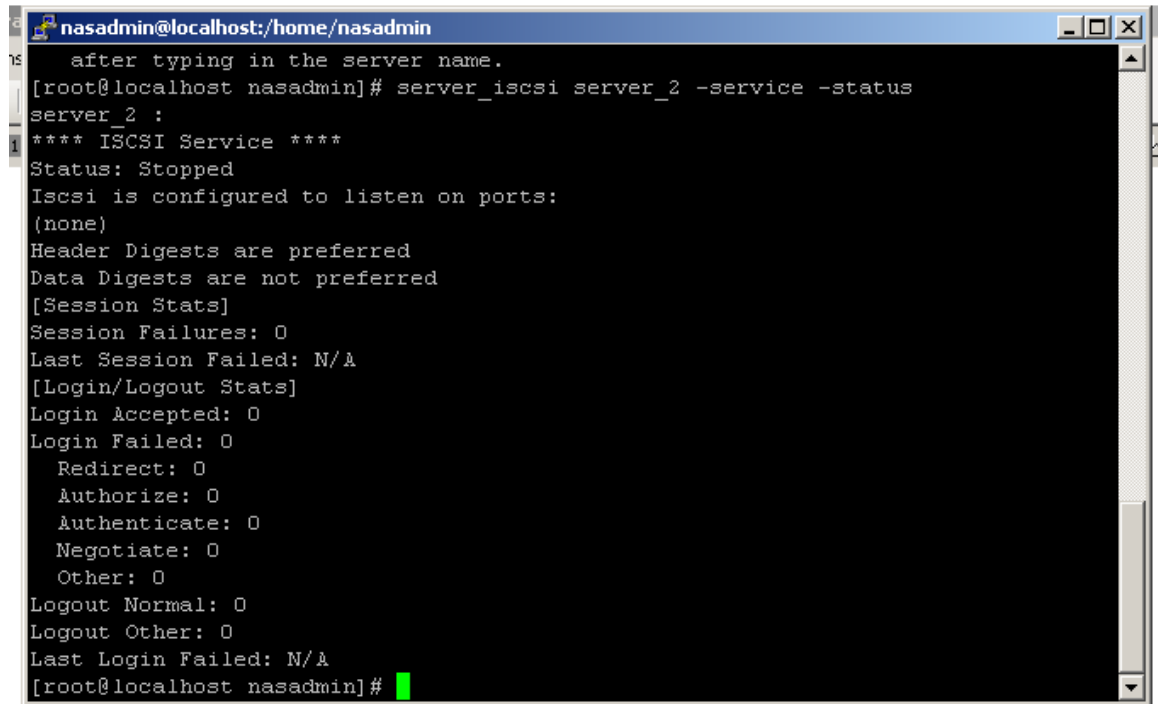
Creating iSCSI LUN

1. We'll assume that the Microsoft iSCSI service is installed and started on the windows server before creating the iSCSI LUN. We will not be installing the iSCSI initiator on the windows host as part of this exercise. There should be a Microsoft iSCSI initiator icon on the windows server desktop.



2. Verify that the iSCSI service is started on the Celerra.
server_iSCSI ALL -service -status

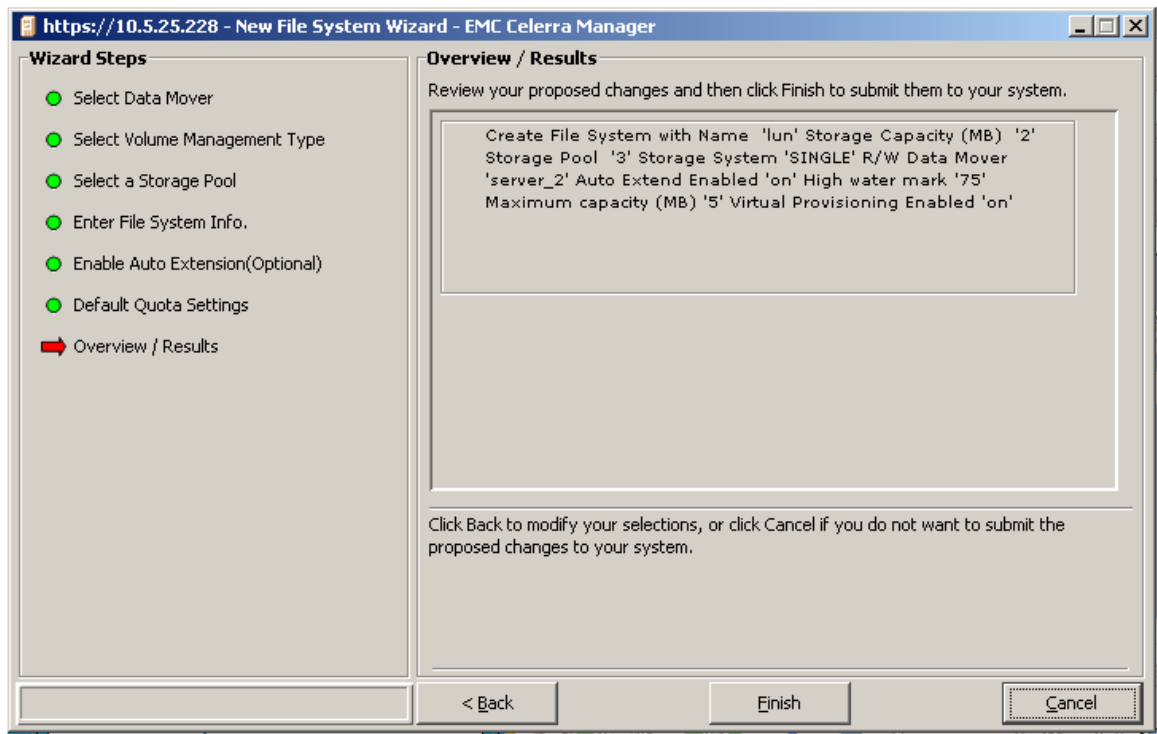
3. You will see this screen If the service is stopped:



```
nasadmin@localhost:/home/nasadmin
after typing in the server name.
[root@localhost nasadmin]# server_iscsi server_2 -service -status
server_2 :
**** ISCSI Service ****
Status: Stopped
Iscsi is configured to listen on ports:
(none)
Header Digests are preferred
Data Digests are not preferred
[Session Stats]
Session Failures: 0
Last Session Failed: N/A
[Login/Logout Stats]
Login Accepted: 0
Login Failed: 0
  Redirect: 0
  Authorize: 0
  Authenticate: 0
  Negotiate: 0
  Other: 0
Logout Normal: 0
Logout Other: 0
Last Login Failed: N/A
[root@localhost nasadmin]#
```

4. If not started: `server_iscsi server_2 -service -start`. You will see a status of “Running.”
5. If you need to stop service: `server_iscsi server_2 -service -stop`.
6. The first step is to create the filesystem to hold the LUN.
7. Log into Celerra Manager.
8. Select Wizards/File Systems/Setup a File System.
9. Select the appropriate data mover from the drop down menu (server_2 by default).
10. Select Storage Pool to auto extend the file system.
11. Since this filesystem will be used for application LUNs, use the storage pool called “CLARiiON RAID 5 performance”.
12. Give the filesystem a name: VP_LUNS.
13. Give the filesystem a size.
14. Select Auto Extend enabled.

15. Enable virtual provisioning. This means that the filesystem will grow beyond the initial amount allocated.
16. Change the high water mark to 75%. This means that the filesystem will auto-extend when it becomes 75% full.
17. Input the Maximum Capacity. This is used when virtual provisioning is enabled.
18. Select No Filesystem Retention Capability.
19. Finish.



20. The next step is to create the iSCSI target.
21. Log into Celerra Manager. Select Wizards/Create an iSCSI Target.
22. Select the appropriate data mover.
23. Enter a name for the target.
24. Enable the iSCSI target portal by selecting the network interface on this data mover and click Apply.

New iSCSI Target	
Choose Data Mover:	server_2
Name:	iscsi
iSCSI Qualified Target Name:	
Network Portals:	10.5.25.230 (Optional)

25. The next step is to create an iSCSI LUN.
26. Log into Celerra Manager.
27. Select CLI commands. You can also run this command from putty/secure crt.
28. Type this command:

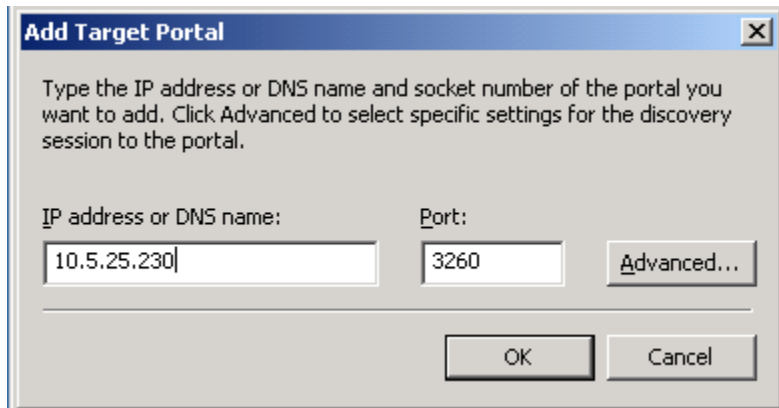

```
server_iscsi server_2 -lun -number 2 -create CELERRA_LUNS -size 35M -fs vp_luns -vp yes
```
29. When you select ok, you'll get an informational warning message indicating that you have to monitor the size of the storage pool.

```
[nasadmin@localhost nasadmin]$ server_iscsi server_2 -lun -number 2 -create iscsi
i -size 35M -fs VP_LUNS -vp yes
server_2 : done

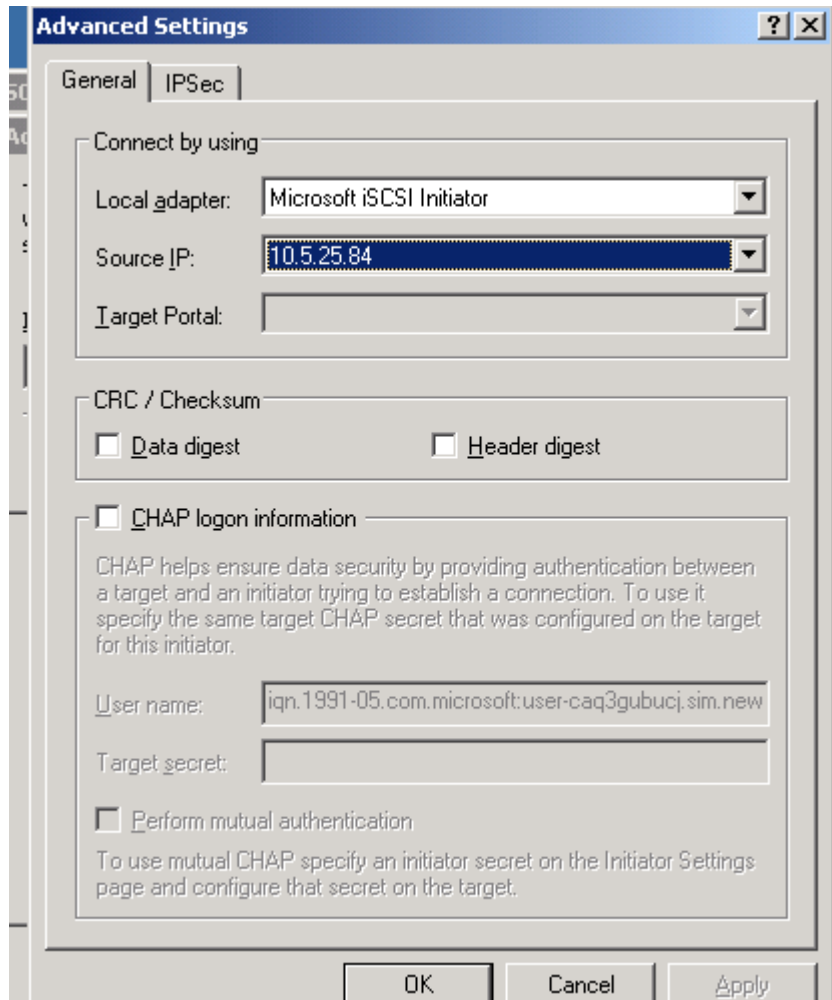
Warning 17716815834: server_2 : You have just created a virtually provisioned (sparse) LUN. To avoid data unavailability and potential data loss when a filesystem is 100 percent full, monitor file system utilization to ensure the filesystem contains sufficient free space for LUN growth. For more information, refer to Configuring iSCSI Targets on Celerra available on the user documentation CD.
[nasadmin@localhost nasadmin]$
```

30. From Celerra Manager, select Data Movers/Server_2/iSCSI/Targets. You should not see any connected initiators.
31. Go to the windows hosts and double click on the Microsoft iSCSI Initiator icon.
32. Select the Discovery tab.
33. Select Add and input the Portal IP address of the target. You can get this by viewing the iSCSI Target properties Network Portals section.
34. If you initially have trouble adding a Discovery Target, remove the listed target and select Add again.

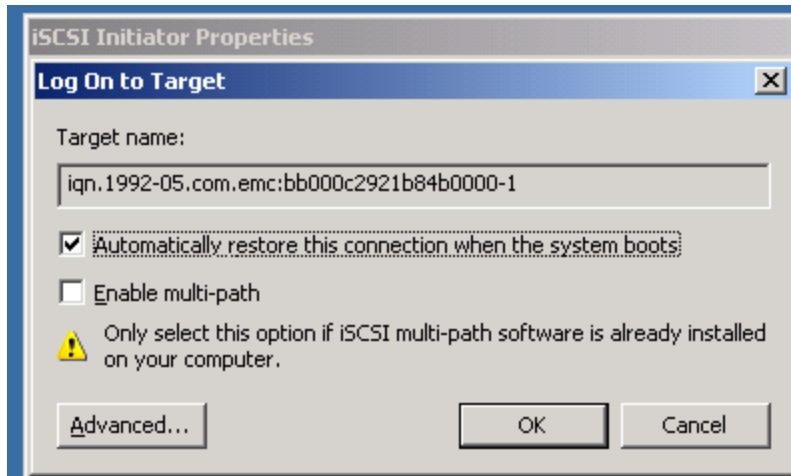
35. Select the Advanced button.



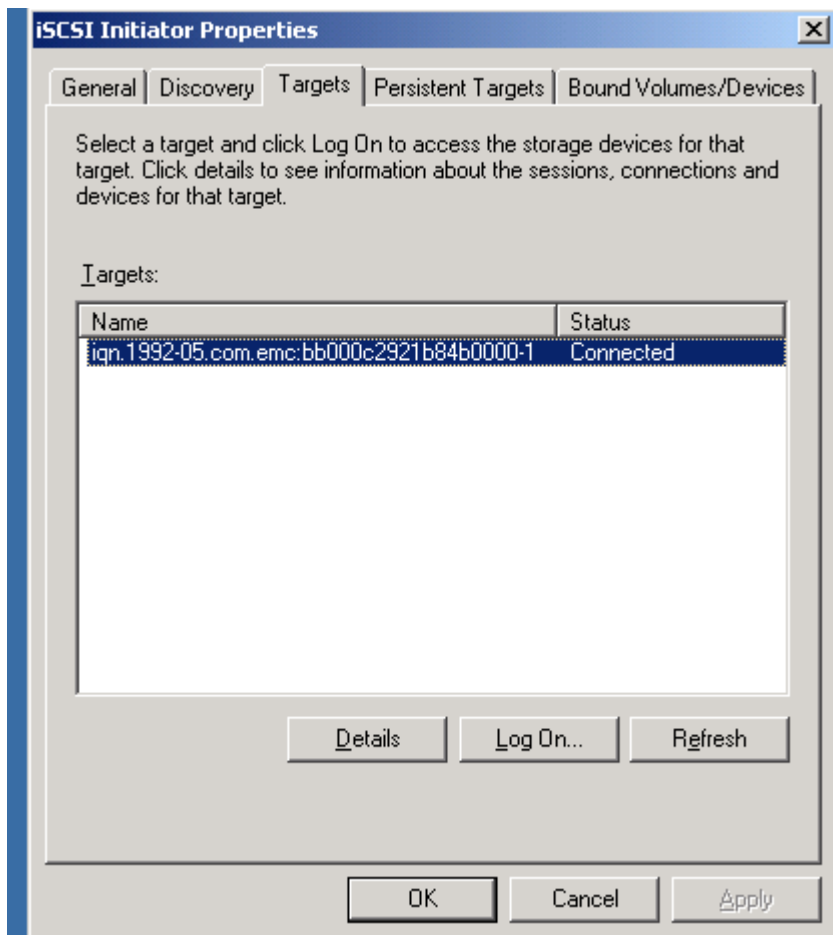
36. Under Local Adapter, select Microsoft iSCSI Initiator and for Source IP select the IP address of the windows server. Click Ok.



37. Under Add Target Portal, enter in the IP address of the interface configured on the Celerra.
38. Select the Target Tab.
39. You should see the Target created on the Celerra listed.
40. Select that Target and then Logon.



41. Select the box to Automatically restore this connection when the system boots and then Ok.
42. The Status should change to Connected.



43. Close the properties; go back to Celerra Manager and refresh the view.
44. When looking at the Target tab, you should see that there is a connected Initiator.

LUNs Targets Configuration CHAP Access				
Show iSCSI Targets for: <input type="text" value="server_2"/>				
<input type="text"/>				<input type="button" value="Search"/>
Name ▲	Network Portals	iSCSI Qualified Target Name	Connected Initiators	Data Mover
iscsi	10.5.25.230	iqn.1992-05.com.emc:bb000c2921b8...	1	server_2

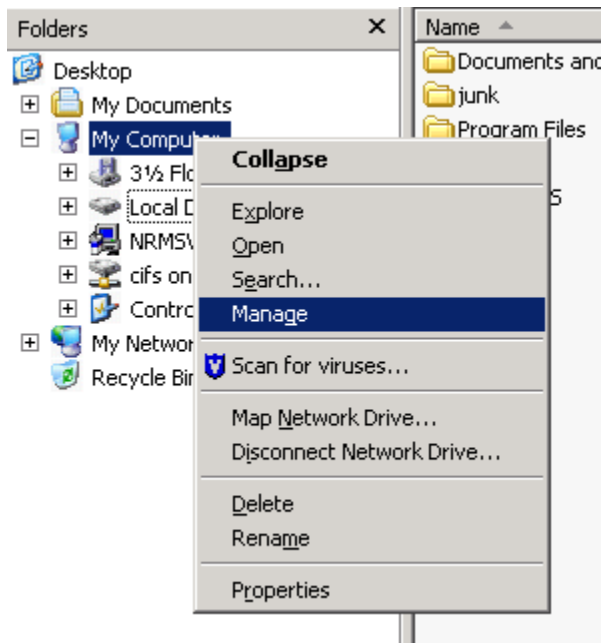
45. Select Properties and highlight the Connected Initiator Name.

iSCSI Target Properties	
Target LUN Mask	
Data Mover:	server_2
Name:	iscsi
iSCSI Qualified Target Name:	iqn.1992-05.com.emc:bb000c2921b84b0000-1
Network Portals:	<input type="text" value="10.5.25.230"/>
Connected Initiators:	iqn.1991-05.com.microsoft:user-caq3gubucj.sim.newtonlab.emc.com
LUNs Defined:	2

46. Copy that and go to the LUN Mask tab.
47. Select New and paste the initiator in the Initiator section.
48. Before selecting OK, you need to decide which LUNs you'll grant access to.
49. Look in the LUNs defined section. Decide which you'll give access to and input that into the Grant LUNs section. Select Apply.

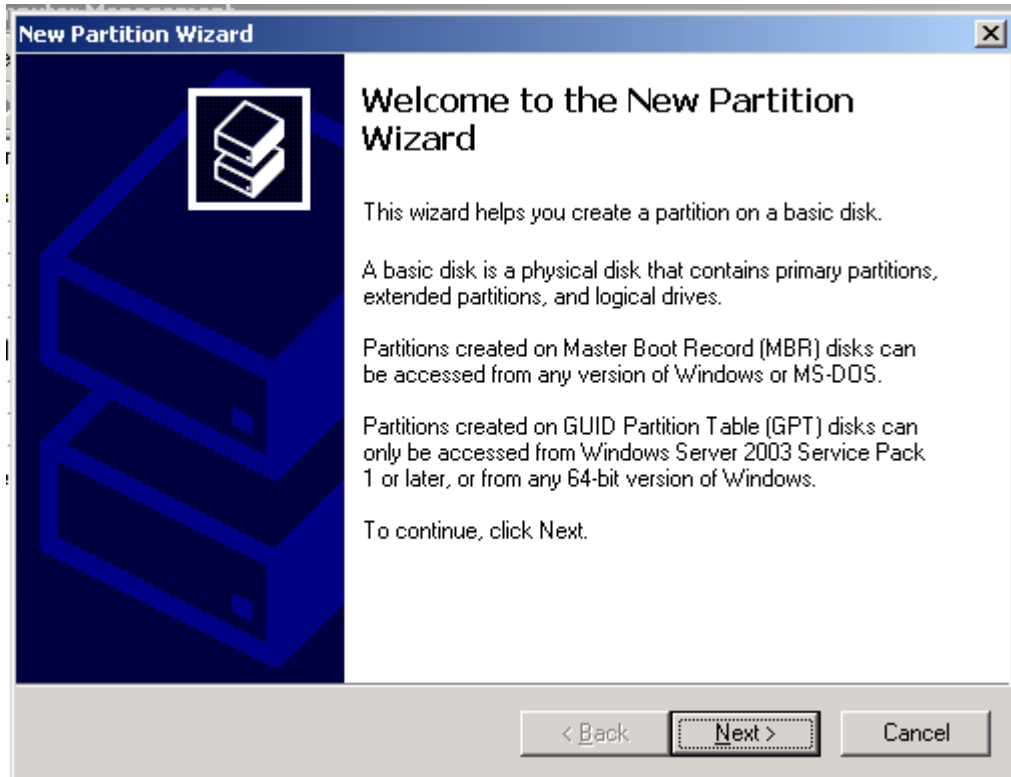
New iSCSI Mask	
Data Mover:	server_2
Target:	iscsi
LUNs defined:	2
Initiator:	iqn.1991-05.com.microsoft:user-caq3gubucj.sim.newtonlab.emc.com
Grant LUNs:	<input type="text" value="2"/>

50. View the filesystem created for the iSCSI LUNs. It should be empty.
51. Return to the windows host.
52. Right click on the Start button and select Explore.
53. Right click on My Computer and select Manage.

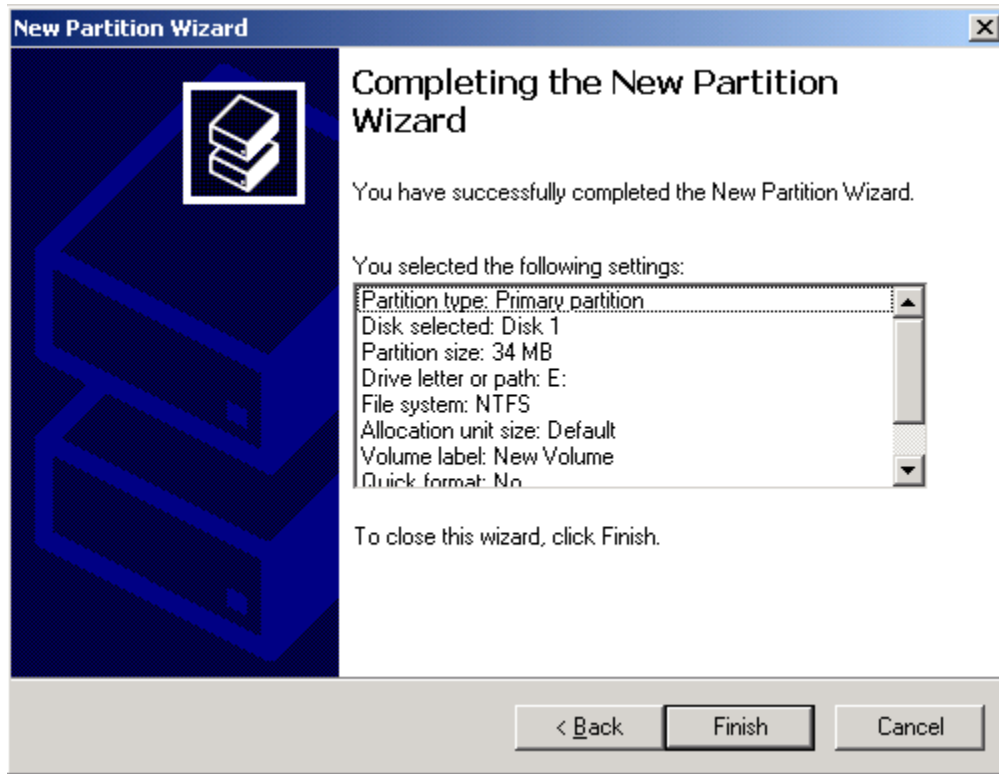


54. Under Storage, select Disk Management.
55. Because the Target and Initiator have connected, you should be presented with a Disk that says Unallocated. An Initialize and Convert Disk Wizard should appear.
56. Select the Disks you want to Initialize and then Next. Select Disk 2 first.
57. Don't select anything to be converted. Just select Next.
58. Select Finish.

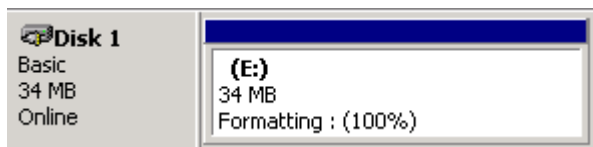
59. If you are not prompted with the Wizard, continue with the next step. If you are able to partition the disk, the activity will complete successfully.
60. If you complete the following steps, you will still be able to write data to your partition.
61. The disks are initialized, but the space is unallocated. We need to create a partition on each disk.



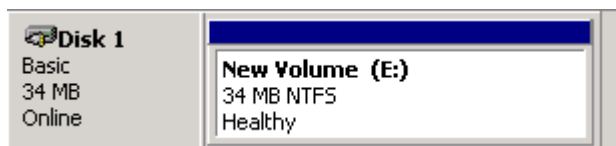
62. Right click disk 1; select new partition.
63. In the New Partition window, select Primary Partition and then select Next.
64. Use the available space and select Next.
65. Assign the first available Drive letter and then Next.
66. Format the new disk with the NT filesystem. Select Next, then Finish.



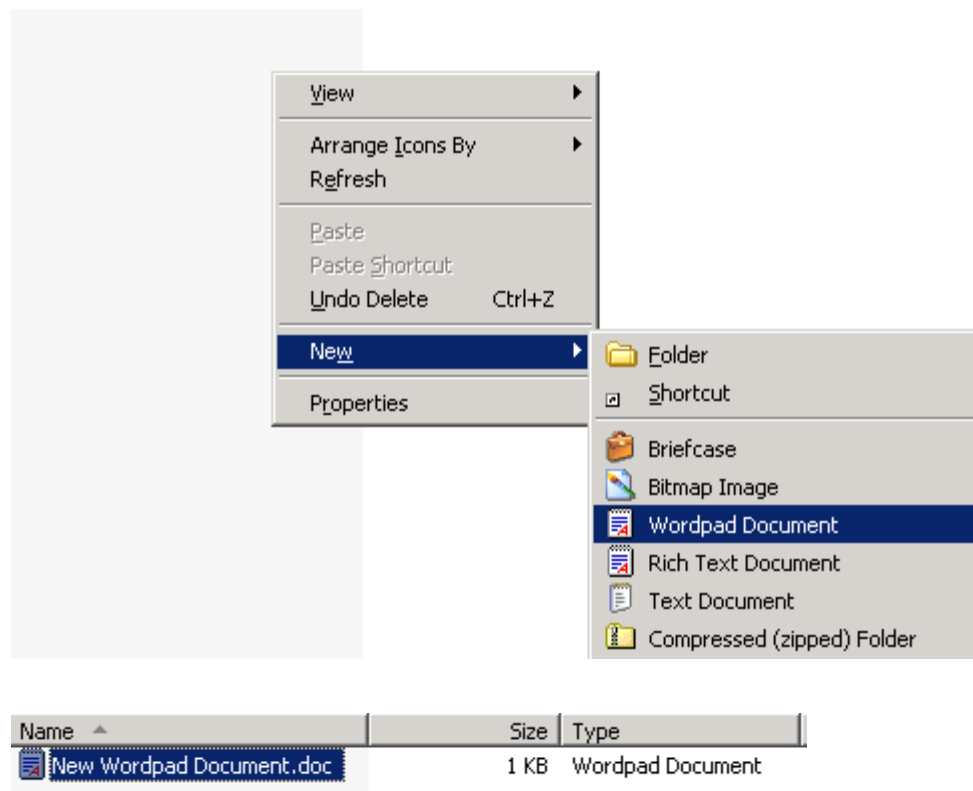
67. The Disk will say Formatting.



68. When completed, the disk will illustrate the New Volume followed by the drive letter. The size and Healthy will also be listed.



69. You're now ready to write data to the new volumes.
70. You can test the ability to write data to the new partition by selecting the drive space to the right of the drive letters, right click, select New then Wordpad document.
71. When the document is open, type in some text and then save the document. The size should increase.
72. If the document is able to save and the increase in size is noticeable, then you have successfully created an iSCSI LUN and written data to it.



iSCSI Troubleshooting

- After creating the network interface that the iSCSI connection will use, verify that you can ping the interface: `server_ping server_2 10.5.25.230`.
- Verify that you can ping the Windows server that you will make the iSCSI connection to: `server_ping server_2 10.5.25.84`.
- After verifying network connectivity, when you add the network portal on the host, there should be no issues logging in.
- First, ensure that you have sufficient disk for these items to be created when creating the file system and LUN.
- To view current list of targets: `server_iSCSI server_2 --target --list`
- To view complete details on a target: `server_iSCSI server_2 --target --info --all` (this command will also show you connected initiators)
- To view stats on a target: `server_iSCSI server_2 --target --stat -all`
- To view LUN info: `server_iSCSI server_2 --lun --list`
- To view LUN details: `server_iSCSI server_2 --lun --info --all` (this command will show you the LUN name as well as filesystem)
- To view the LUN mask (this will show you what initiators have been granted access to which LUNs): `server_iSCSI server_2 --mask -list`