



Multipath SAN Solution: Implementation Guide

This implementation guide describes how to setup a
SAN Solution in a Non Clustered, Multipath
environment.

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INTRODUCTION

Below is an Example configuration of a multi path SAN Environment:

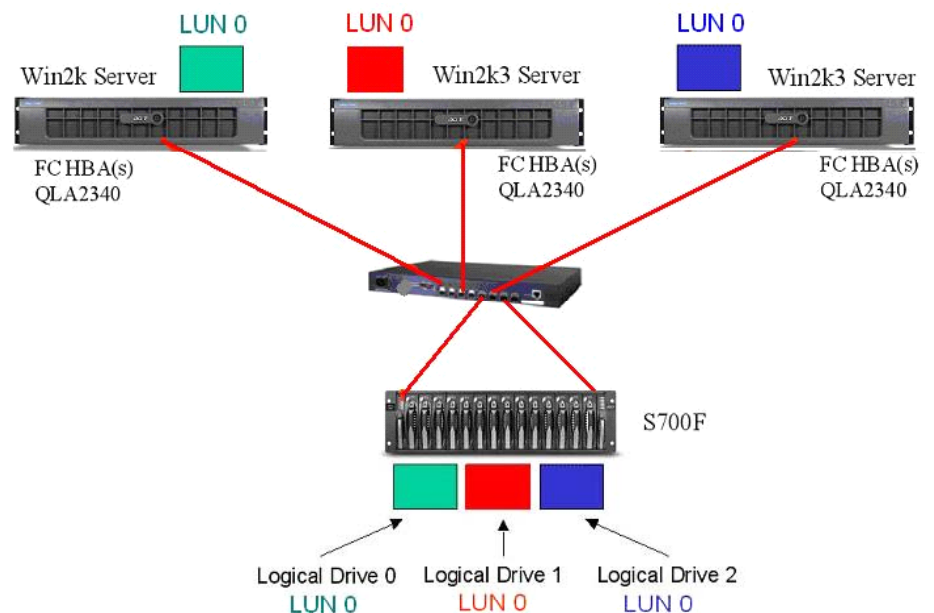
- 1x Windows 2000 Server (QLogic QLA2340)
- 1x Windows 2003 Server with Exchange (QLogic QLA2340)
- 1x Windows 2003 Server with File and Print Server (QLogic QLA2340)
- 1x S700F (Dual Loop, Two Controller)
- 1x Brocade SlikWorm 3800

This is only a SAN setup, there is no Cluster Function at all in the Configuration and every Server is assigned a dedicated RAID Array for exclusive use.

There will be multiple paths from the Windows 2000 and Windows 2003 Server Systems to the Storage Box so we need to be careful about which QLogic driver and SANsurver Software from QLogic to use. QLogic together with SANsurver Software are free tools which are used to provide fail over cover between the different paths. We will set up the Adaptec SSD Software (2.1) on the Windows 2000 Server. SSD stands for Spheras Storage Director and it's the Raid Management Software for the S700F Storage Box.

A special Registry string will also need to be set for this configuration to correctly show the Multi path access to the storage.

The configuration is shown below :-



Who should read this Guide?

This configuration guide is intended for:

- Acer field site engineers who are installing and configuring Non Clustered Multipath San Solutions
- Acer Solution Partners who are providing technical solutions to customers

WHAT IS MULTI PATH ?

Whenever there are several paths from one Server to the disk drives we talk about a multi path. In this example, we have multiple paths because even though we only have one fibre channel cable coming from each Server to the Fabric Switch, there are two cables from the Switch to the Altos S700F unit. To have even more fault tolerance we could of course add a second controller to each server and connect it to a second Fabric Switch that can access the Altos S700F.

Without additional Software installed, Microsoft Windows 2000 and also Windows 2003 Server will find the available Disk through two different paths and even though it is the same Disk / Array it would be listed twice in the Disk Manager utility. To avoid this and also provide a fail over between the different paths we recommend using the QLogic Driver.

QLogic QLogic multi-path driver provides HBA failover and high availability (HA) on QLA234x FC HBA(s). The following version has been tested with Windows 2000 and with Windows Server 2003 in non-cluster configuration. The QLogic SAN configuration utility (SANsurfer) is used to specify the primary and alternate paths for to access each target device. QLogic will detect certain error status codes and miniport events, and retry failed IO operations on the alternate path. QLogic will hide the alternate path from Windows to keep Windows from configuring in a second copy of a device. The tested configurations and procedures will be outlined in this document.

Tested Configuration

QLogic FC HBA	QLA2340 & QLA2342
QLogic BIOS	1.34
SCSI Miniport Driver	8.2.3.11 for Windows Server 2003 and Windows 2000
QLogic Driver	8.01.12 for Windows Server 2003 and Windows 2000
SANsurfer utility	2.0.27
S700F RAID Controller F/W	9.40.00

QLogic BIOS Setting Verification

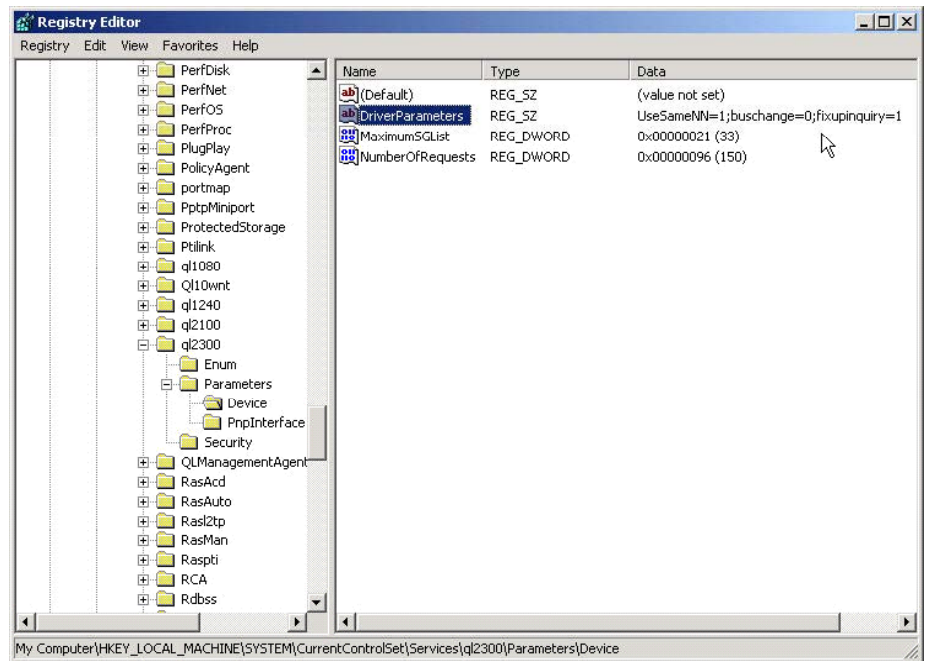
- Check the QLogic BIOS version is 1.34.
- In general, the default QLogic BIOS settings should be applied.

SCSI Miniport Driver Installation

- Make sure the driver version is 8.2.3.11
- The following Windows Registry setting is applied for multi-path configuration. A re-boot is required after a Windows Registry setting change.

\HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\ql2300\Parameters\Device

DriverParameters: UseSameNN=1 ; BusChange=0 ; FixupInquiry=1

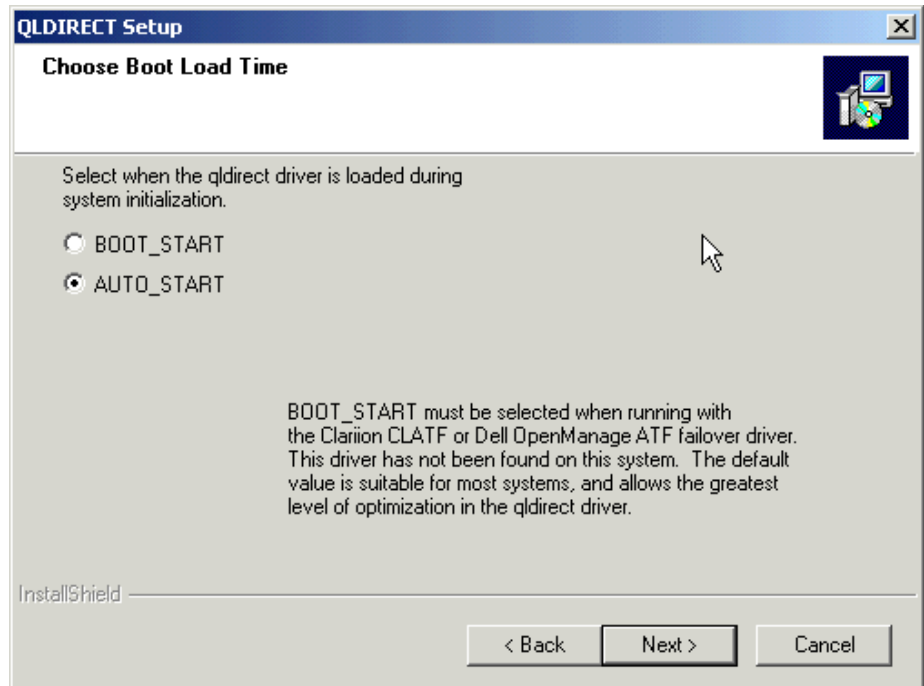
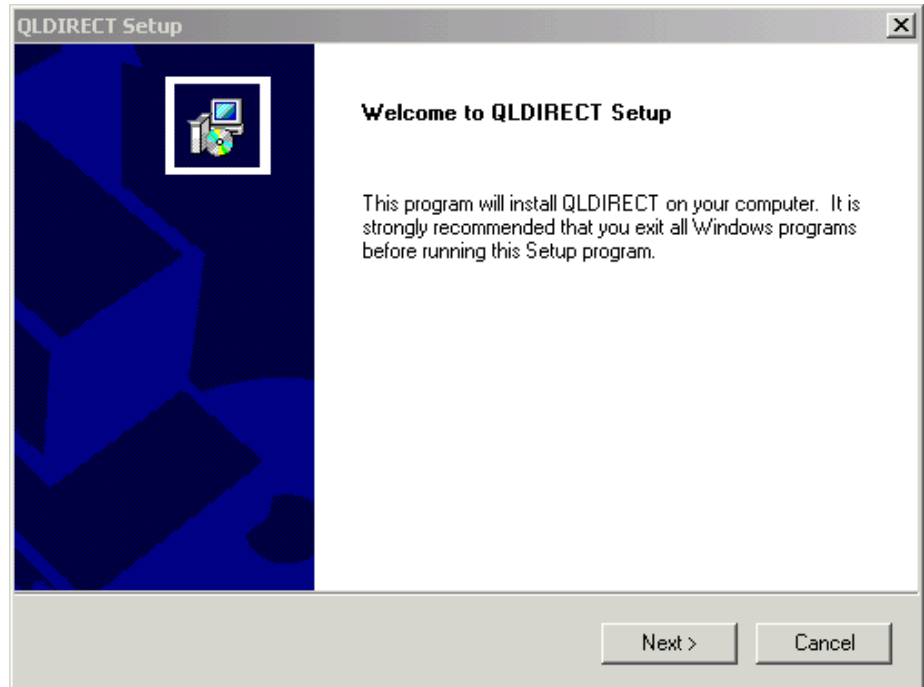


Notes:

- buschange=0 (ensures the OS doesn't remove the device prior to fail-over)
- fixupinquiry=1 (allows the devices to be detected the same by both HBA's.)

QLdirect Driver Installation

- Install QLdirect driver version 8.01.12



SANsurfer Installation & Configuration

- Install SANsurfer version 2.0.27.
- Launch SANsurfer Console and "Configure" the LUN/Path and "Save" the configuration with the default password "config". When you do this for the first time you will see an error message. This is normal as your fail over has not been configured correct before. You will not see this error message when you change the configuration at a later stage. For the details, please refer to "SANsurfer Applications User's Guide".
- You can then check the Multi-path function verification by disconnecting the primary path (unplug the cable) and see the preferred path change to the alternate path, allowing continuous I/O access to the disks.

Note: You can only verify the configuration after the set up of all the Arrays / LUN's is complete. We also recommend to do the configuration again after all LUN's are configured and you set up the desired LUN masking.

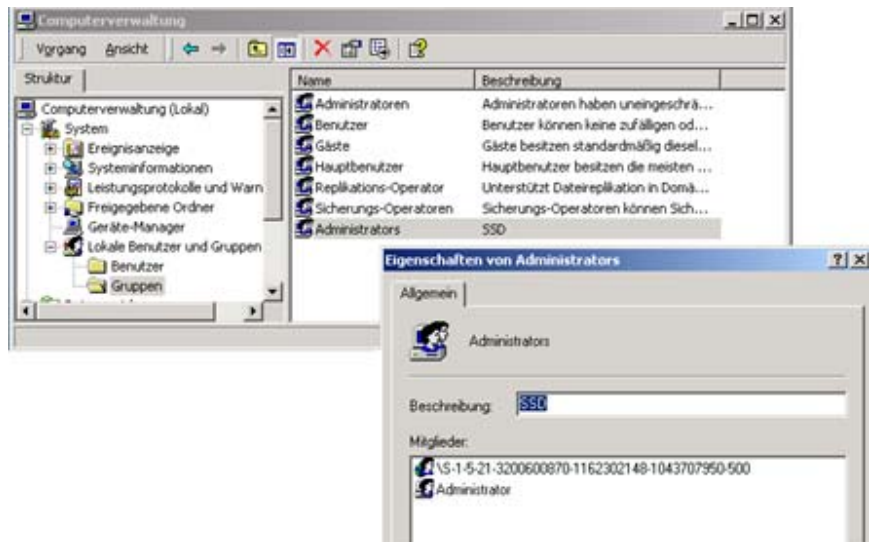
For More Information

1. QLA234x User's Guide
2. SANsurfer Application User's Guide

MULTILINGUAL SUPPORT FOR SSD UTILITY

The SSD Utility doesn't have multilingual support as such. For the Software to run and be able to configure RAID Arrays and LUN's, the logon user must have administrator rights. If you have an Operating System that is not English you need to create the Group "Administrators" and place the User Account of your system Administrator into this Group.

So for example, with German version of Windows 2000 you will find the default User Account for the Administrator named "Administrator" in the Group "Administratoren". Once you have created the Group of "Administrators" you also need to add the User account of "Administrator" into this Group. Once the account is in both groups and you have set a password that is not blank you will be able to start the SSD Utility and log on to it.

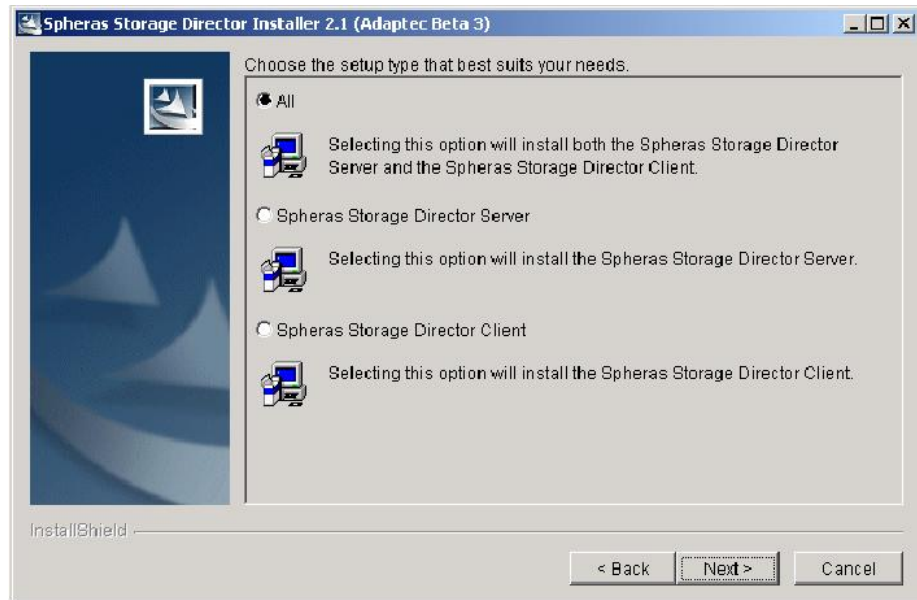


INSTALLATION AND CONFIGURATION OF YOUR SSD UTILITY

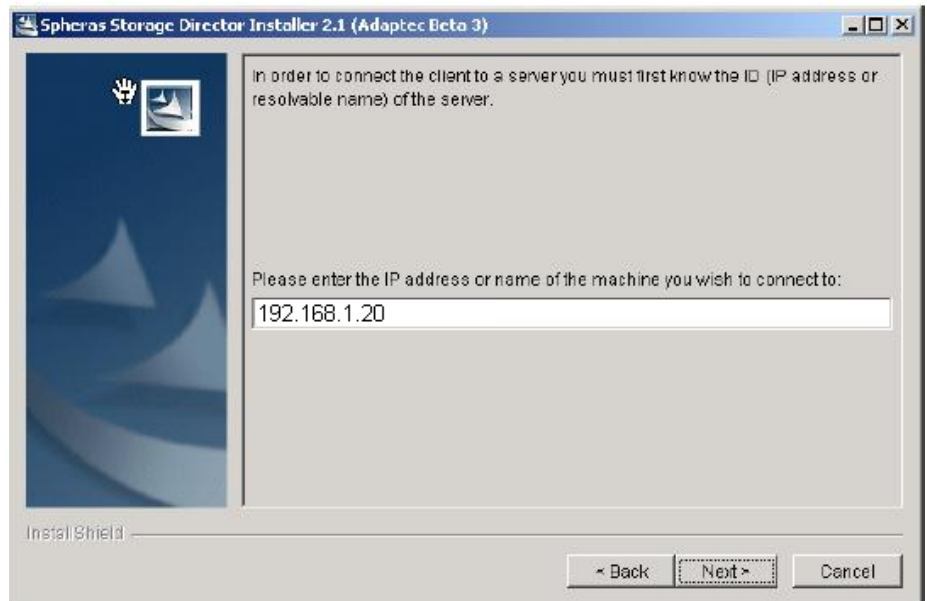
SSD Installation

We've already mentioned the workaround for the different OS language versions and their spelling of Administrator, the next two points which need to be noted when installing the Software are :-

1. Select to install "ALL" when asked about SSD Server & Client :-



2. Select the IP Address of the server on which you installed the SSD Software. In our case it was as below :-



3. Please follow the Instructions of the Software and launch the Utility.

Configuring RAID Array

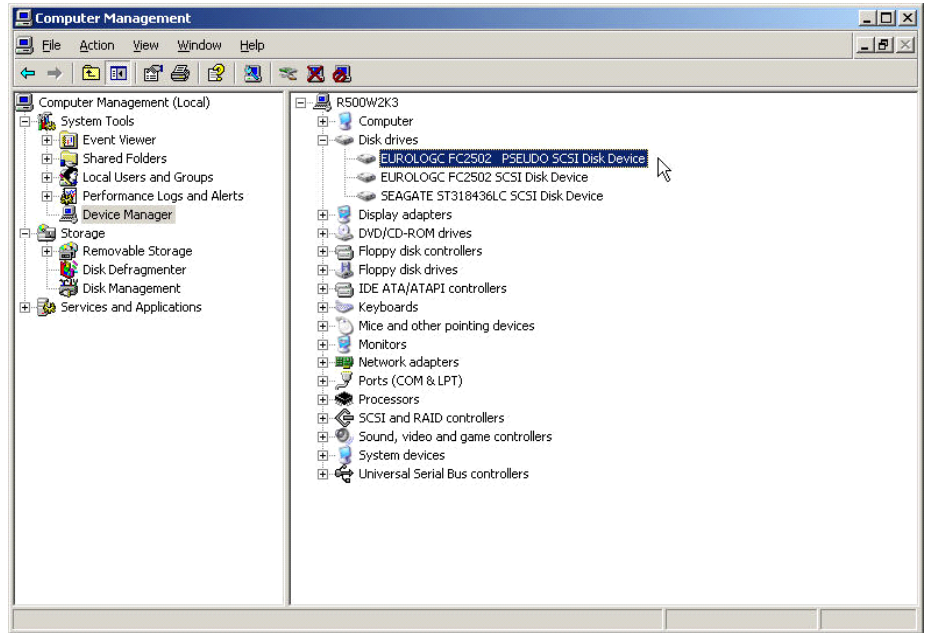
1. Right-click on the controller, select Configure Storage -> Manually.
2. Select the drives that you want to add to the array, click on Add to array and Next
3. Click on New Logical Drive and Next to use the default setting.
4. Following the instructions to finish the RAID creation and you will see the listed in SSD. Repeat the step 1 – 3 to configure the arrays as you need. At first please make sure you select "Enable All" in the LUN / Host Masking (once all LUNs are set up and all Servers are connected you can also set up the LUN masking).

For More Information

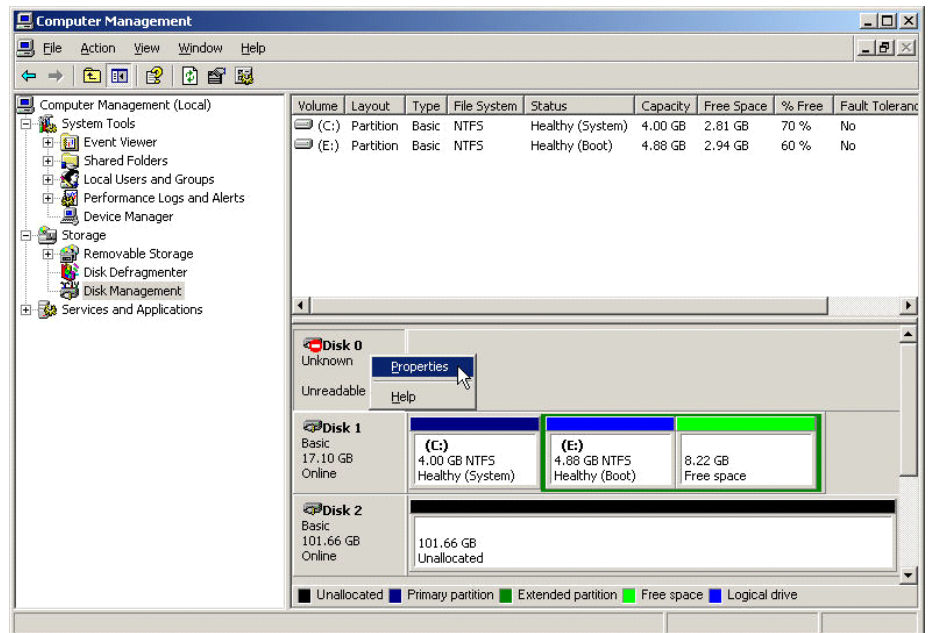
1. Sphas Storage Director User Guide.

ALTOS S700F LUN MASKING

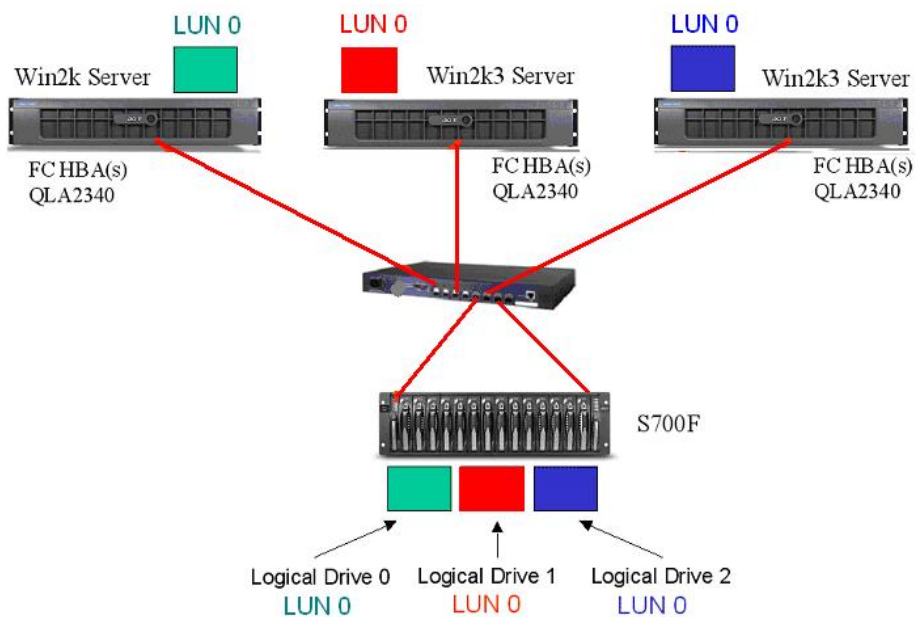
Altos S700F can create many LUN(s) and these LUN(s) can be assigned to the different servers for their own usage. LUN masking is a mechanism by which you assign a LUN to the specific server(s) securely. There is an important principle in that the server's first LUN from Altos S700F must be numbered "0". If the first LUN number is not 0, than the "PSEUDO SCSI Disk" would be generated by Windows 2003 in addition to "EUROLOGC FC2502 SCSI Disk Device" :-



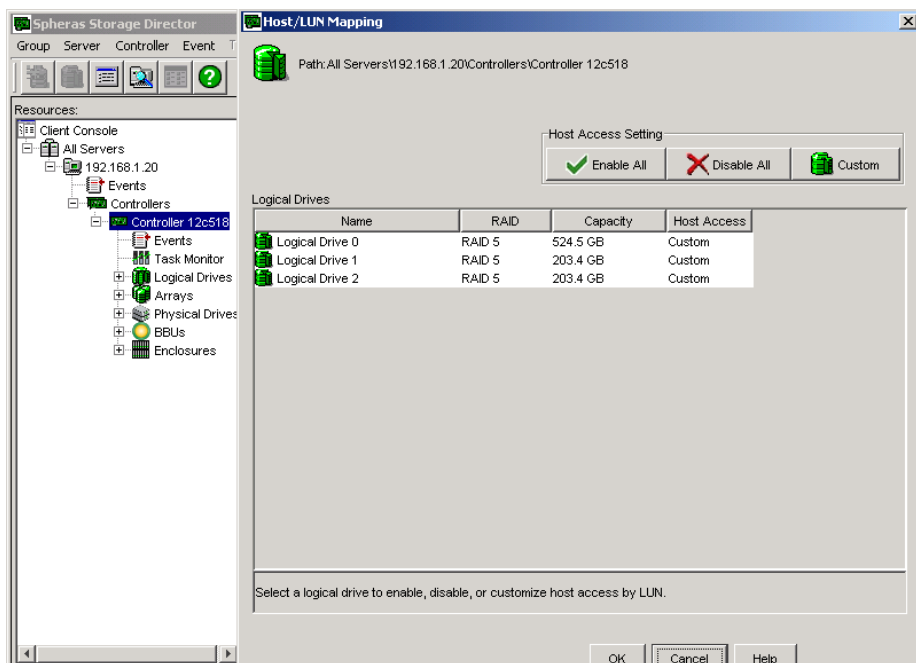
and then the "Unreadable Disk" would be displayed in Windows Server 2003 Disk Management. :-



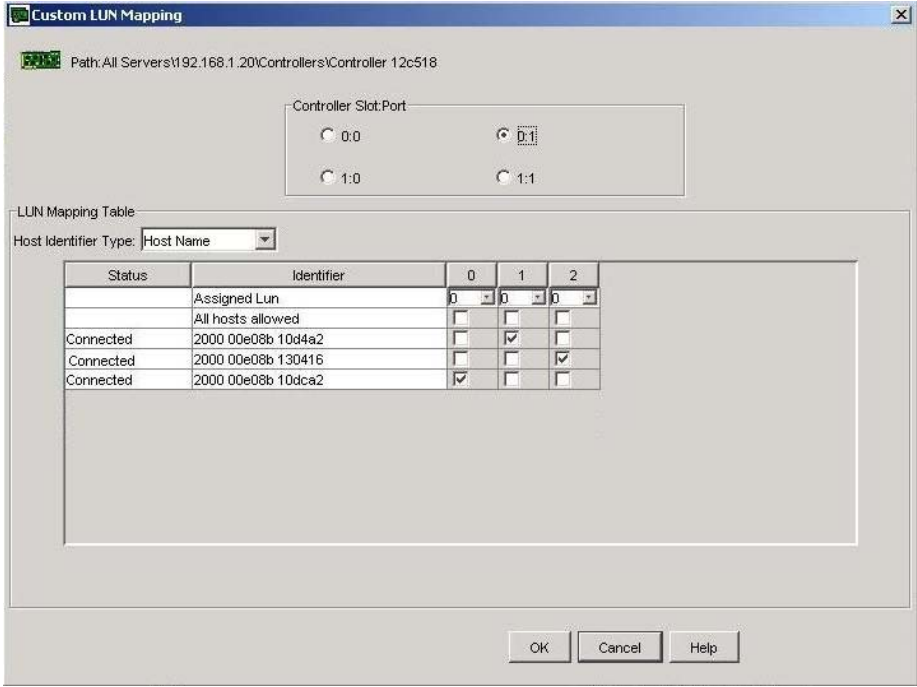
For our configuration we used the following setup :-



So as you can see, even though the two Windows 2003 servers were using Logical drives 1 and 2, they were assigned as LUN 0. When looking at the SSD Software you can see the 3 x Logical drives :-



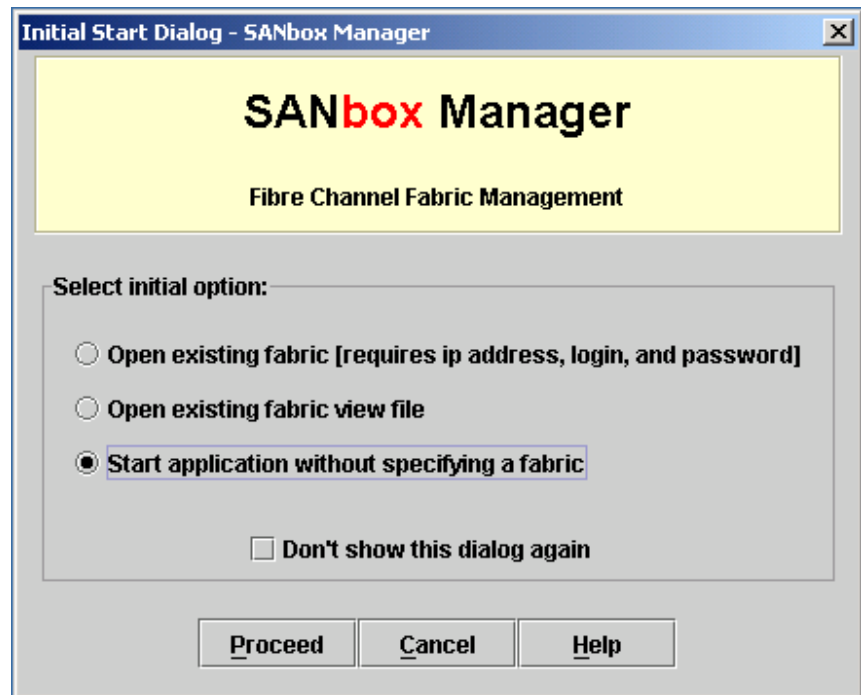
Then when you select the LUN Mapping table you should see the following screen, showing each LUN as being LUN 0 and having only one server assigned to them. Hence, each server has a unique LUN on the external storage Box.



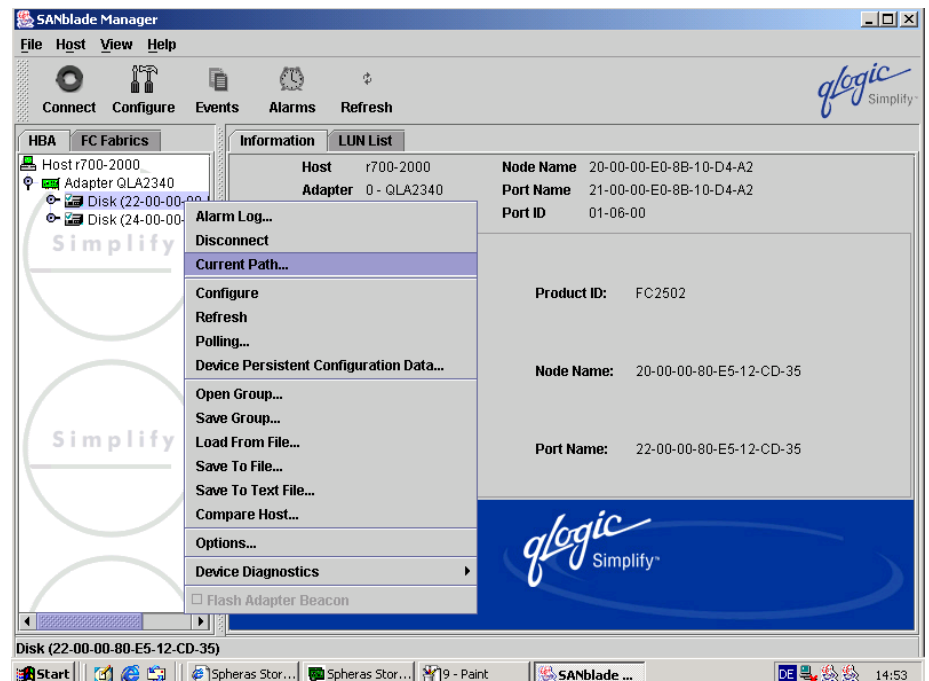
Note: When you configure the LUN Masking you must have all Servers connected to your SAN. You can identify the Server by the World Wide Port Name of the Controller.

MULTIPATH VERIFICATION

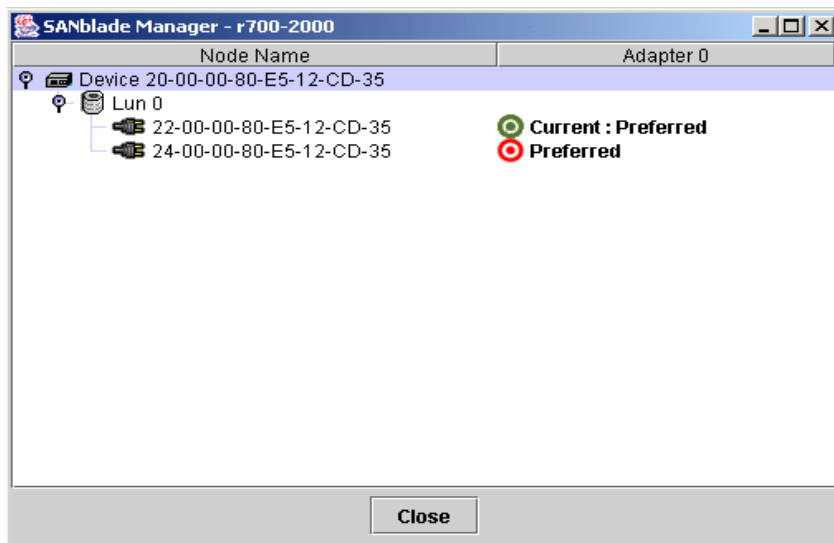
To view the Multipath setup, just launch the SanSurfer utility :-



Select to connect to local host and you should then see the two alternative paths to the data :-

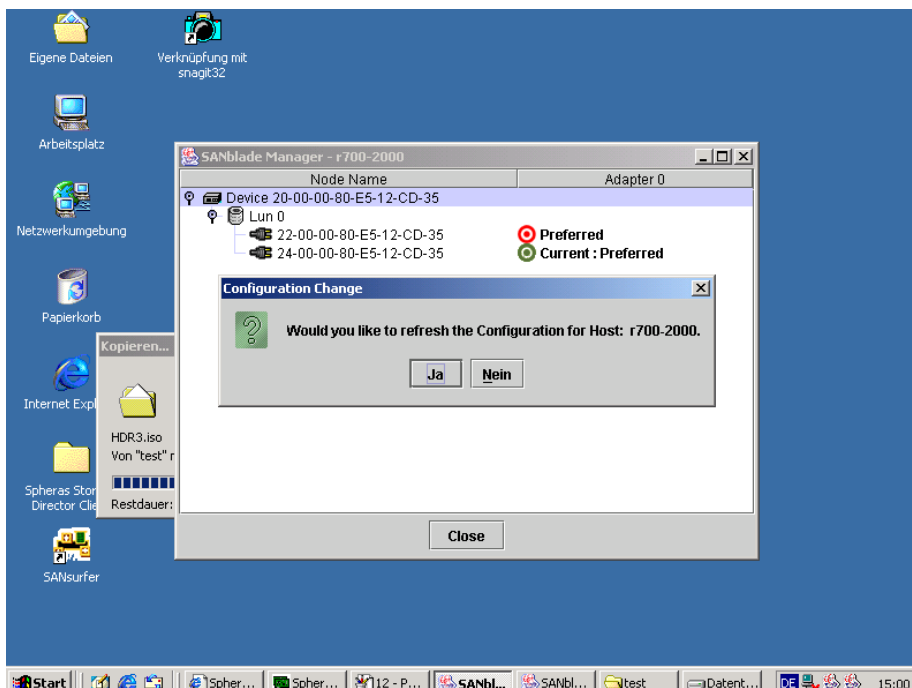


On selecting the current path you will see the path the data traffic takes :-

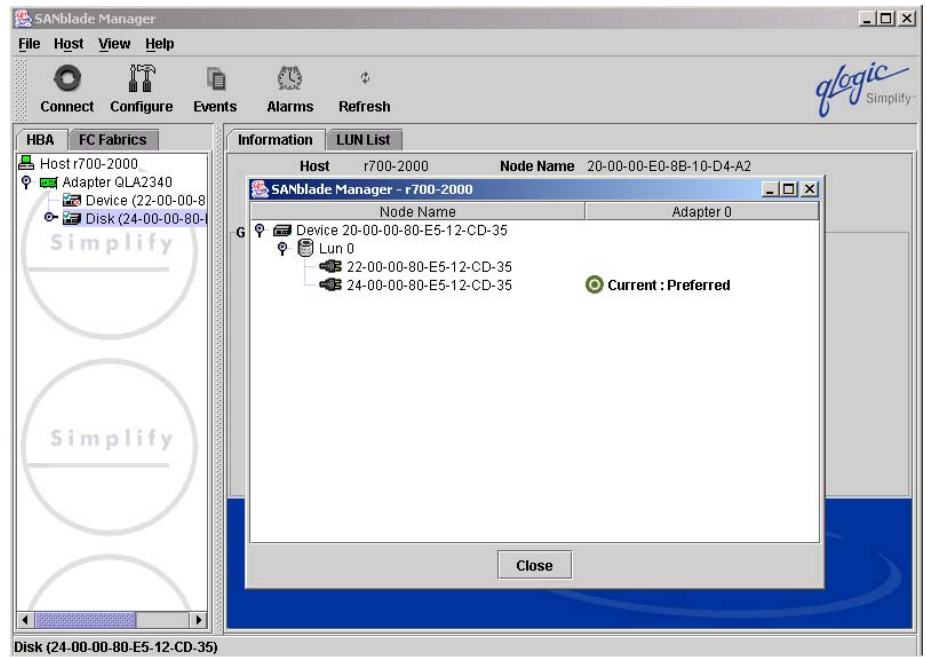


A simple test to verify that you do indeed have multi path access to the external storage is to copy files from your server onto it's assigned LUN 0 on the Altos S700F.

Checks the LEDs on the front of the FC Switch to see which port the traffic is on. After detecting the flashing LED on the port connected to the active I/O Module of the S700F, just disconnect that cable. The copy process should stall for a second or two and then you will see the LED port of the second I/O Module of the S700F start flashing. A pop up window will appear in SANSurfer asking you to refresh the configuration :-



You shall then see that the current preferred path has changed :-



You will then see the data copying process continue as normal and you will see the traffic on the new port connected the second I/O port. The file size of the copied data on LUN 0 should be the same size as the original copy on the server.

Congratulations, you have now setup a Non Clustered Multi path San Solution and proven it's fail over capability.