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# DtS Data Migration to the MSA1000 – NetWare Environments

*Abstract:* This white paper outlines step-by-step procedures for data migration from Direct Attach Storage on Smart Array Controllers, RA4100, and RA4100 Clusters to the MSA1000.

#### **DtS Architecture Data Migration**

Direct Attach Storage (DAS) to SAN (DtS) architecture is an exclusive Hewlett Packard feature that provides a quick and easy way to migrate stored data protected by Smart Array and RA 4100 controllers to a StorageWorks MSA1000 storage system.

Data stored on one-inch universal disk drives (Ultra2 and Ultra3) using newer Smart Array controllers and data stored on RA4100 storage systems can be migrated to the StorageWorks MSA1000. Following a step-wise procedure, you simply remove the drives from the older systems and insert them into the MSA1000. Existing data, RAID sets, and configuration information will remain intact allowing data migration to be completed in minutes, not hours.

Key features and benefits of <u>DtS</u> architecture include:

- Instant consolidation of DAS into a SAN environment
- DtS creates an upgrade path from Smart Array and RA4100 controlled drives and data to a SAN environment
- Simple redeployment of DAS to SAN environment for growth management and capacity utilization
- Supports up to <u>42</u> drives and <u>32</u> volumes

HP Array Controllers that support DtS are:

Smart Array 3100ES
Smart Array 3200
Smart Array 4200
Smart Array 4250ES
Smart Array 431
Smart Array 5i
Smart Array 532
Smart Array 5312
Smart Array 5300
RA 4100 Controllers

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# Migrating Data from Smart Array controllers, RA4100, and RA4100 Clusters

The following steps illustrate the migration from direct attached storage to the Hewlett Packard StorageWorks MSA1000 – all controlled by the same Host server.

**IMPORTANT:** It is recommended that you record the current configuration of all arrays and note which drives are part of each array prior to performing the migration. If you need to fall back to your former configuration, you will be required to re-enter all array and volume information.

#### Installation Notes and Prerequisites:

**Hardware:** As the HP FCA2210 HBA is an industry standard PCI adapter; it should work in all PCI compliant slots, regardless of server vendor. During the qualification and testing phase for both the Hewlett Packard FCA2210 HBA and the HP Modular SAN Array 1000, several vendor hardware platforms were tested - including server models from IBM, and Dell. Refer to the compatibility matrix for more details on multi-vendor x86 platform support.

**Software:** Minimum Operating System levels for the host computers are: Novell NetWare 5.1 with service pack 5 and Novell NetWare 6.0 with service pack 2.

**Refer to the Appendix for more detailed information on Migration Prerequisites and Migrations Limitations.** 

# Migration Steps from a Smart Array Controller or RA4100 to the MSA1000:

These steps will cover migrating **Data drives only** from a Smart Array controller or RA4100 to the MSA1000. These steps will also apply to migrating an RA4100 NetWare cluster to the MSA1000. Notes are placed in the steps below where applicable for clusters. Smart Array controlled Boot drive migrations will be covered in the next section.

- 1. <u>Back up and verify</u> all data on the drives to be migrated to tape or disk.
- 2. <u>Note and record</u> the current configuration of all arrays/volumes and record which drives are part of which array. This can be done in Array Controller Utility (ACU) by highlighting one of the arrays/volumes and recording the drive positions in the chassis (Note: ACU will flash the lights of a full array, a volume, or an individual drives depending on which item is selected in the GUI interface, making it easier to record the information).
- 3. If Secure Path 3.0b for NetWare is installed, this software must be removed. After a successful migration, Secure Path can be re-installed, but ONLY the new version (currently Secure Path 3.0c for NetWare) is supported with the MSA1000.
- 4. Down the server that has the Smart Array or RA4100 storage that is to be migrated.

(NOTE: If bringing down a cluster, perform the prescribed procedure for downing a NetWare cluster).

5. Install the FCA2210 HBA in a server slot and attach the fiber optic interconnect component for appropriate communication to the MSA1000. Interconnect drawings are shown on the *StorageWorks Modular SAN Array 1000 Installation Overview* poster that was shipped with the MSA1000. Ensure that all interconnect components are in place for proper communication from the FCA2210 to the MSA1000.

(NOTE: For clusters, steps 5-20 will have to be carried out for each server in the cluster).

- 6. Power on your server and run the server vendor's BIOS setup utility. Use the BIOS setup utility to perform the vendor-specific tasks required to install the adapter (if applicable). Save the configuration, and perform a reboot of the server.
- 7. On reboot, let the server load the NetWare operating system. Mount the MSA1000 Support Software CD for NetWare / Linux (for HBA drivers).
- 8. To install the NetWare drivers for the HBA, load the NetWare program NWCONFIG:

TEST1:load NWCONFIG\_

9. Select "Driver options" from the main menu.

NetWare Configuration

Configuration Options						
Driver Options	(load/unload disk and network drivers)					
Legacy Disk Options	(configure NetWare partitions/volumes)					
NSS Disk Options	(configure NSS storage and volumes)					
License Options	(install or remove licenses)					
Directory Options	(install NDS)					
NCF files Options	(create/edit server startup files)					
Multi CPU Options	(install/uninstall SMP)					
Product Options	(other optional installation items)					
Exit						

Use the arrow keys to highlight an option, then press <Enter>.

10. Select "Configure disk and storage device drivers".

Ne	tWare Configuration		
	Configuration Options		
	D L Driver Options	etwork drivers) ions/volumes) and volumes)	
	L Configure disk and storage device drivers D Configure network drivers N Return to previous menu	nses) rtup files)	
	Product Options (other optional instal Exit	lation items)	
Ľ			
H	lp <fl> Previous screen <esc></esc></fl>	Abort nwconfig <alt><f10></f10></alt>	

11. Select "Select an additional driver".



12. Press <Insert> to install an unlisted driver.

NetWare Configur	ation				
	Select	a driver:			
Select a driver:     AACRAID.HAM   Adaptec AdvancedRAID Controller     ADPT160M.HAM   Adaptec Ultral60 ASPI & SCSI Module     AFC9XXX.HAM   Adaptec Fibre Channel Host Adapter AFC9XXX Module (HAM)     AFCNW.HAM   Agilent-Technologies Fibre Channel Host Adapter AFCNW Module     v   AHA2940.HAM     Adaptec AIC-7870 ASPI & SCSI Module					
" <u>4</u> W1: w1: T1:	ACRAID.HAM" Help Men you load the driver Mich host adapter you a Mis is done with the co (To scroll, <f7< td=""><td>, you need to tell it re loading the driver for. mmand line option v &gt;-up <f8>-down)</f8></td></f7<>	, you need to tell it re loading the driver for. mmand line option v >-up <f8>-down)</f8>			
Select a listed Help	driver <enter> <fl></fl></enter>	Install an unlisted driver <ins> Continue without selecting <f10></f10></ins>			

13. Press <F3> to specify the path to the HAM driver. The path to specify is HPSSCD100:\HBA\NetWare\drivers

(HPSSCD100 is the volume name of the MSA1000 Support Software CD for NetWare / Linux)

NetWare Configuration	
Path A:\ will be scanned for drivers to inst directory path corresponds to where the driv	all. Verify that this er file (*.DSK, *.CDM, or
*.HAM) is located. Drivers for a large numb included with NetWare. You may insert the a	er of disk controllers are nnronriate NetWare diskette
(or specify a NetWare CD-ROM directory), or	insert a third-party diskette.
On the CD-ROM, disk drivers are located in d drivers are in \DRIVERS\LAN, and PSM drivers \DRIVERS\PSM.	irectory \DRIVERS\STORAGE, LAN are located in directory
Press <f3> to specify a different path;</f3>	
Press <enter> to continue.</enter>	
(To scroll, <f7>-up <f8></f8></f7>	-down)
Continue <ent< td=""><th>er&gt;</th></ent<>	er>
Select a listed driver <enter> Ins</enter>	tall an unlisted driver <ins></ins>
Help <f1> Con</f1>	tinue without selecting <flo></flo>

14. Press <Enter> to select the QLogic HAM driver and select "Yes" to copy the driver from the CD to the server directory (for both the .HAM and .DDI file)

NetWare Configuration
Select a driver to install:
QL2300.HAM QLogic QLA2300 PCI Fibre Channel Host Adapter Module QL2300D.HAM QLogic QLA2300 PCI Fibre Channel Host Adapter Module
Do you want to copy driver QL2300.HAM?
No Yes
"QL2300.HAM" Help This HAM driver is for the QLogic QLA2300 family of PCI Fibre Channel host bus adapters. (To scroll, <f7>-up <f8>-down)</f8></f7>
Select a listed driver <enter> Install an unlisted driver <ins>   Help <fl> Previous screen <esc> Abort nwconfig <alt><f10></f10></alt></esc></fl></ins></enter>

15. Specify the path where you want the drivers to be copied to.



	<b>2</b> 1 <i>2</i>	1	
NetWare Con	figuration		
	QL2300 Param	eters ———	
			÷.
	Slot Number:		
	Scan All Luns:	Yes	
	Failback Enabled:	Yes	
	Read Configuration:	Yes	
	Requires Configuration:	No	
	Report All Paths:	Yes	v
	Driver QL2300 Param	eter Actions	
	Select/Modify driver par	ameters	
	Save parameters and load	driver	
Help <fl></fl>	Previous screen <esc> Change</esc>	Lists <tab></tab>	Abort <alt><f10></f10></alt>

16. Choose "Select/Modify driver parameters", and press Enter.

17. Add the slot number (this corresponds to the numbered PCI slot that the HBA was installed in.

NetWare Configura	ation			
Г		- QL2300 Param	aeters ———	
	Slot Numbe	er:	1	
	Scan All I	luns:	Yes	
	Failback H	Snabled:	Yes	
	Read Confi	iguration:	Yes	
	Requires (	Configuration:	No	
	Report All	l Paths:	Yes	ŭ
		"Slot Number'	' Help	
	Dri			
	1.0.0	Supported val	lues: any dec	imal number of maximum 🐘
	Select/M	length 8.		
	Save par	Select the s	lot number tr scroll <87>-	un <f8>-down)</f8>
Save field data	<enter></enter>	(10)	Abor	t field entry <rsc></rsc>
Help	<f1></f1>		Abor	t nwconfig <alt><f10></f10></alt>

NetWare Config	uration		
	QL2300 Param	eters ———	
			<u>^</u>
	Slot Number:	1	an a
	Scan All Luns:	Yes	
	Failback Enabled:	Yes	
	Read Configuration:	Yes	
	Requires Configuration:	No	
	Report All Paths:	Yes	V.
	Driver QL2300 Param	eter Actions	
	Select/Modify driver par	ameters	
	Save parameters and load	driver	
Helm (Fis Dr.	Change	Trine ATaba	About Alles (RIOS
nerp viz Pro	evious screen <ksc> change</ksc>	HISUS VIADA	ADDIC SATESSIDS

18. Press Escape, select "Save parameters and load driver"

19. When asked, "Do you want to select an additional Disk driver?", select "No" and press Enter.



- 20. Exit from the NWCONFIG utility, down the NetWare server, and then power it off.
- 21. Migrate the drives from the Smart Array controller or RA4100 to the MSA1000. It is important to note that **all drives** controlled by the Smart Array controller or RA4100 must be migrated to the MSA1000. Drive order is not important although it is recommended that drives be moved to the same bay position in the new unit. Note and record the locations of the drives and their corresponding arrays in case that information is needed for later use.
- 22. Make sure all drives are fully seated in the MSA1000 and power it on. When the startup process of the MSA1000 is complete, the following message displays:

"01 COMPAQ MSA1000 STARTUP COMPLETE"

23. Scroll back through the messages on the MSA1000 display and verify that the number of volumes (arrays) you intended to migrate is detected. This can be verified by the message:

"120 Configured Volumes: X" (where X is the number of volumes migrated/detected)

24. After the MSA1000 reports the correct number of migrated volumes, power on your NetWare server and let it load the operating system.

(NOTE: In a cluster, bring up the primary server first. Once this NetWare server can access the volumes correctly, bring up the remaining servers in the cluster).

25. After the server loads, check to ensure that all the NetWare volumes migrated

At the server prompt, type:

VOLUME – this will display the volumes that are mounted

LIST STORAGE ADAPTERS – this will display a list of registered storage adapters and the devices they drive

All drives previously controlled by the Smart Array or RA4100 controller are now being controlled by the MSA1000.

#### Boot Drive Migration Steps (Smart Array controller to the MSA1000):

It is possible to also migrate NetWare boot drives to the MSA1000. While the MSA1000 supports external / SAN boot, please check with your Operating System vendor for any possible issues with an externally / SAN booted operating system.

The following steps assume that the MSA1000 you are migrating to is a new install, and currently does not support any volumes for other servers.

- 1. Back up and verify all data on the drives to be migrated to tape or disk.
- 2. <u>Note and record</u> the current configuration of all arrays/volumes and record which drives are part of which array. This can be done in Array Controller Utility (ACU) by highlighting one of the arrays/volumes and recording the drive positions in the chassis (Note: ACU will flash the lights of a full array, a volume, or an individual drives depending on which item is selected in the GUI interface, making it easier to record the information).
- 3. If Secure Path 3.0b for NetWare is installed, this software must be removed. After a successful migration, Secure Path can be re-installed, but ONLY the new version (currently Secure Path 3.0c for NetWare) is supported with the MSA1000.
- 4. Down the server that has the Smart Array storage that is to be migrated.
- 5. Install the FCA2210 HBA in a server slot and attach the fiber optic interconnect component for appropriate communication to the MSA1000. Interconnect drawings are shown on the *StorageWorks Modular SAN Array 1000 Installation Overview* poster which shipped with the equipment. Ensure that all interconnect components are in place for proper communication from the FCA2210 to the MSA1000.
- 6. Power on your server and run the server vendor's BIOS setup utility. Use the BIOS setup utility to perform the vendor-specific tasks required to install the adapter (if applicable). Save the configuration, and perform a reboot of the server.
- 7. Let the NetWare OS load, then install the HBA drivers.
- 8. To install the NetWare drivers for the HBA, load the NetWare program NWCONFIG:



9. Select "Driver options" from the main menu.

1	JetW	Jare Confi	guratio	n							
	Configuration Options										
	D	river Opt:	ions		(load/ur	nload dis	k and	networ	ck drivers	)	
	L	egacy Disl	k Optio	ns (co	onfigure	e NetWare	parti	tions/	(volumes)		
	N	ISS Disk O	ptions		(configu	are NSS s	torage	e and v	/olumes)		
	L	icense Opt	tions		(instal)	l or remo	ve lic	enses)			
	D	irectory )	Options		(instal)	L MDS)					
	N	ICF files (	Options		(create,	/edit ser	ver st	artup	files)		
	M	Multi CPU (	Options		(instal)	l/uninsta	11 SMF	9)			
	P	roduct Opt	tions		(other d	optional	instal	lation	n items) 👘		
	E	lxit									
٦U	Jse	the arrow	keys t	o highl	light ar	n option,	then	press	<enter>.</enter>		

10. Select "Configure disk and storage device drivers".

N	etWare Configuration		
	Configuration Options		
	D L Driver Options N L Configure disk and storage device drive	etwork drivers) ions/volumes) and volumes) rs nses)	
	N Return to previous menu	rtup files)	
	Product Options (other optional inst Exit	allation items)	
H	elp <fl> Previous screen <esc></esc></fl>	Abort nwconfig <alt><f10></f10></alt>	

11. Select "Select an additional driver".

NetWare Con	figuration
	Selected Dick Drivers
	Additional Driver Actions
	Discover and load additional drivers Select an additional driver Deselect a selected driver Return to previous menu
Help <f1></f1>	Previous screen <esc> Change Lists <tab> Abort <alt><f10></f10></alt></tab></esc>

12. Press <Insert> to install an unlisted driver.

Net	tWare Configur	ation	
		Selec	t a driver:
v	AACRAID.HAM ADPIIGOM.HAM AFC9XXX.HAM AFCNW.HAM AHA2940.HAM "A WP WP WP TP	Adaptec AdvancedRA: Adaptec Ultral60 AS Adaptec Fibre Chann Agilent-Technologic Adaptec AIC-7870 AS Adaptec AIC-7870 AS ACRAID.HAM" Help then you load the driv hich host adapter you his is done with the (To scroll, ~	D Controller SPI & SCSI Module mel Host Adapter AFC9xxx Module (HAM) es Fibre Channel Host Adapter AFCNW Module SPI & SCSI Module ver, you need to tell it a are loading the driver for. command line option v (F7>-up <f8>-down)</f8>
Se.	lect a listed	driver <enter></enter>	Install an unlisted driver <ins></ins>
He.	Tb	<ft></ft>	Continue without selecting <f10></f10>

13. Press <F3> to specify the path to the HAM driver. The path to specify is HPSSCD100:\HBA\NetWare\drivers

NetWare Configuration Path  $A: \$  will be scanned for drivers to install. Verify that this directory path corresponds to where the driver file (\*.DSK, \*.CDM, or \*.HAM) is located. Drivers for a large number of disk controllers are included with NetWare. You may insert the appropriate NetWare diskette (or specify a NetWare CD-ROM directory), or insert a third-party diskette. On the CD-ROM, disk drivers are located in directory \DRIVERS\STORAGE, LAN drivers are in \DRIVERS\LAN, and PSM drivers are located in directory \DRIVERS\PSM. Press <F3> to specify a different path; Press <Enter> to continue. (To scroll, <F7>-up <F8>-down) Continue < Enter >Select a listed driver <Enter> Install an unlisted driver <Ins> Help <Fl> Continue without selecting <F10>

(HPSSCD100 is the volume name of the MSA1000 Support Software CD for NetWare / Linux)

14. Press <Enter> to select the QLogic HAM driver and select "Yes" to copy the driver from the CD to the server directory (for both the .HAM and .DDI file)

NetWare Configuration
Select a driver to install:
QL2300.HAM QLogic QLA2300 PCI Fibre Channel Host Adapter Module QL2300D.HAM QLogic QLA2300 PCI Fibre Channel Host Adapter Module
Do you want to copy driver QL2300.HAM?
"QL2300.HAM" Help This HAM driver is for the QLogic QLA2300 family of PCI Fibre Channel host bus adapters. (To scroll, <f7>-up <f8>-down)</f8></f7>
Select a listed driver <enter>Install an unlisted driver <ins>Help <fl>Previous screen <esc>Abort nwconfig <alt><fl0></fl0></alt></esc></fl></ins></enter>

15. Specify the path where you want the drivers to be copied to.

NetWare Configuration	
Select a driver to install:	
QL2300.HAM QLogic QLA2300 PCI Fibre Channel Host Adapter Module QL2300D.HAM QLogic QLA2300 PCI Fibre Channel Host Adapter Module	
Specify a server boot path (where SERVER.EXE will be):	
>C:\NWSERVER	
"QL2300.HAM" Help This HAM driver is for the QLogic QLA2300 family of PCI Fibre Channel host bus adapters. (To scroll, <f7>-up <f8>-down)</f8></f7>	
Continue <enter></enter>	
help vir Abore field vir	

16. Choose "Select/Modify driver parameters", and press Enter.

NetWare Conf	figuration		
	0L2300 Param	eters	
	Slot Number:		
	Scan All Luns:	Yes	
	Failback Enabled:	Yes	
	Read Configuration:	Yes	
	Requires Configuration:	No	
	Report All Paths:	Yes	V I
	Driver OL2300 Param	eter Actions	
	Select/Modify driver par	ameters	
	Save parameters and load	driver	
Help <fl></fl>	Previous screen <ksc> Change</ksc>	Lists <tab></tab>	Abort <alt><f10></f10></alt>

17. Add the slot number (this corresponds to the numbered PCI slot that the HBA was installed in.

NetWare Configur	ration			
		— 01/2300 Parat	meters	
	Slot Numbe Scan All 1 Failback 1 Read Conf: Requires ( Report Al)	er: Suns: Snabled: iguration: Configuration: L Paths:	l Yes Yes Yes No Yes	∼ 
Save field data	Dri Select/M Save par	"Slot Number' Supported val length 8. Select the sl (To s	" Help lues: any dec lot number th scroll, <f7> &amp;hor</f7>	imal number of maximum at corresponds to the v up <f8>-down)</f8>
Help	<f1></f1>		Abor	t nwconfig <alt><f10></f10></alt>

18. Press Escape, select "Save parameters and load driver"



19. When asked, "Do you want to select an additional Disk driver?", select "No" and press Enter.

NetWare Configuration	
Select a driver to install:	
QL2300.HAM QLogic QLA2300 PCI Fibre Channel Host Adapter Module QL2300D.HAM QLogic QLA2300 PCI Fibre Channel Host Adapter Module	
Do you want to select an additional Disk driver?	
No Yes	
"QL2300.HAM" Help This HAM driver is for the QLogic QLA2300 family	
(To scroll, <f7>-up <f8>-down)</f8></f7>	
Select a listed driver <enter>Install an unlisted driverHelp<f1>Continue without selecting</f1></enter>	<ins> <f10></f10></ins>

- 20. Exit from the NWCONFIG utility, down the NetWare server, and perform a reboot.
- 21. As the server is rebooting, this screen will appear (press CTRL-Q to access the QLogic BLOS utility):

BIOS utility):
1152 MB Detected
COMPAQ System BIOS - P21 (08/03/2001)
Copyright 1982,2001 Compaq Computer Corporation. All rights reserved.
Processor 1 initialized at 1.0 GHz/133 MHz with 256 Kbvte Cache
Processor 2 initialized at 1.0 GHz/133 MHz with 256 Kbyte Cache
COMPAQ Integrated Smart Array Controller (ver 1.42) O Logical Drive(s)
1785-Slot O Drive Array Not Configured No Drives Detected
QLogic Corporation
QLA2312 PCI Fibre Channel ROM BIOS Version 1.29 Subsystem Vendor ID OE11
Copyright (C) QLogic Corporation 1993-2002. All rights reserved.
www.qlogic.com
Press <ctrl-q> for Fast!UTIL</ctrl-q>

- Selected Adapter Adapter Type I/O Address 2800 Fast!UTIL Options Configuration Settings Scan Fibre Devices Fibre Disk Utility Loopback Data Test Select Host Adapter Exit Fast!UTIL
- 22. At the QLogic main Menu, select Configuration Settings (default) and press Enter

23. Select the first option, Host Adapter Settings



Host Adapter Settings BIOS Address: CC000 BIOS Revision: 1.29 Adapter Serial Number: E40440 Interrupt Level: 3 Adapter Port Name: 210000E08B0678B8 Host Adapter BIOS: Disabled Frame Size: 2048 Loop Reset Delay: 5 Adapter Hard Loop ID: Disabled Hard Loop ID: 0 Spinup Delay: Disabled	Selecte Adapter Type QLA23xx	d Adapter I/O Address 2800		
		Host Adapter Set BIOS Address: BIOS Revision: Adapter Serial Number: Interrupt Level: Adapter Port Name: Host Adapter BIOS: Frame Size: Loop Reset Delay: Adapter Hard Loop ID: Hard Loop ID: Spinup Delay:	tings CC000 1.29 R40440 3 210000E08B0678B8 Disabled 2048 5 Disabled 0 Disabled	

24. By default, the Host Adapter BIOS is Disabled. Arrow down to Disabled, and press Enter to Enable.

25. Once the BIOS is enabled, the options will look like this:

Selected Adapter Type QLA23xx	i Adapter I/O Address 2800		
	Host Adapter Sett BIOS Address: BIOS Revision: Adapter Serial Number: Interrupt Level: Adapter Port Name: Host Adapter BIOS: Frame Size: Loop Reset Delay: Adapter Hard Loop ID: Hard Loop ID: Spinup Delay:	ings CC000 1.29 E40440 3 210000E08B0678B8 Enabled 2048 5 Disabled 0 Disabled	
Use <arrow key<="" th=""><th>75≻ and <enter> to change</enter></th><th>• settings, <esc> to</esc></th><th>) exit</th></arrow>	75≻ and <enter> to change</enter>	• settings, <esc> to</esc>	) exit

- Selected Adapter Adapter Type I/O Address QLA23xx 2800 Configuration Settings Host Adapter Settings Selectable Boot Settings Restore Default Settings Rew Nyram Data Advanced Adapter Settings Rxtended Firmware Settings Rxtended Firmware Settings
- 26. Press the Escape Key to back up one menu, and arrow down to Selectable Boot Settings, and press Enter to select it.

Ac	Selected Adapte lapter Type QLA23xx	er I/O Address 2800		
		-Selectable Boot	Settings	
	Selectable Boot: (Primary) Boot Por Boot Por Boot Por Boot Por Boot Por Boot Por Boot Por Boot Por	tt Name, Lun: tt Name, Lun: tt Name, Lun: tt Name, Lun: tt Name, Lun: tt Name, Lun: tt Name, Lun:	Disabled 000000000000000000, 00000000000000000	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Us	Boot Por Press "( se <arrow keys=""> and</arrow>	t Name,Lun: C" to clear a Bo ≺Enter≻ to char	oot Port Name entry	exit

27. By default, the Selectable Boot option is Disabled. Press Enter to Enable it.

28. After enabling, it will look like this. Arrow down to (**Primary**) Boot Port Name, Lun:, and press Enter.

	Colorted Mda			
Ada (	apter Type QLA23xx	I/O Address 2800		
		Salartahla Boot	Setting	
		Selectable Boot	seccings-	
	Selectable Boot		Enabled	
	(Primary) Boot	Port Name,Lun:	00000000000000000,	0
	Boot	Port Name,Lun:	0000000000000000,	0
	Boot	Port Name,Lun:	0000000000000000,	0
	Boot	Port Name,Lun:	0000000000000000,	0
	Boot	Port Name,Lun:	0000000000000000,	0
	Boot	Port Name,Lun:	0000000000000000,	0
	Boot	Port Name, Lun:	0000000000000000,	0
	Boot	Port Name,Lun:	0000000000000000,	0
	Press	"C" to clear a Boo	t Port Name entry	
Use	e ≺Arrow keys≻ a	nd <enter> to chang</enter>	e settings, ≺Esc≻ to ≀	exit

29. Next, you are presented with a list of devices found on the SAN. Note: If you do not see any devices listed, there is a fibre cabling problem that will need to be root caused. Arrow down to the MSA1000 that you want to boot from (In this example, we are showing to MSA1000's in the SAN). Once the correct MSA1000 is highlighted, press Enter.

ID	Vendor	Product	o Fibre	Rev	Port	Name	Port ID
128	No devia	ce present					
129	COMPAQ	MSA1000		2.17	500805)	F300011131	011000
130	COMPAQ	MSA1000		2.17	500805	F300011031	011100
.31	No devia	e present					
32	No devia	e present					
.33	No devia	e present					
134 👘	No devia	e present					
35	No devia	e present					
36	No devia	e present					
37	No devia	e present					
38	No devia	e present					
.39	No devia	e present					
40	No devia	e present					
41	No devia	e present					
42	No devia	e present					
140	No devic	e present					

30. The next screen shot shows the available LUNs on the selected MSA1000 controller. Arrow down to the LUN that you want to boot from, and press Enter to select it.

ſ	Sel	lect LUN-	
	Selected device	supports multiple units	
Adapte	LUN	Status	
QLA2			
	0 9	Supported	
	1 1	Not supported	
	2 1	Not supported	
	3 5	Supported	
	4 1	Not supported	
	5 1	Not supported	
	6 1	Not supported	
	7 1	Not supported	
	8 1	Not supported	
	9 1	Not supported	
	10 1	Not supported	
	11 1	Not supported	
	12 1	Not supported	
	13 1	Not supported	
	14 1	Not supported	
	15 1	Not supported	
	Use <pageup pagedown=""> 1</pageup>	keys to display more devices	
Use <arrow ke<="" th=""><th>ys≻ to move cursor, ≺Ent</th><th>ter&gt; to select option, <esc> to</esc></th><th>backup</th></arrow>	ys≻ to move cursor, ≺Ent	ter> to select option, <esc> to</esc>	backup

- Selected Adapter

  Adapter Type
  I/O Address

  QLA23xx
  2800

  Selectable Boot:
  Enabled

  (Primary) Boot Port Name, Lun:
  S00805F300011131, 3

  Boot Port Name, Lun:
  0000000000000, 0

  Boot Port Name, Lun:
  0000000000000, 0

  Boot Port Name, Lun:
  0000000000000, 0

  Boot Port Name, Lun:
  000000000000, 0

  Boot Port Name, Lun:
  0000000000000, 0

  Boot Port Name, Lun:
  00000000000000, 0

  Boot Port Name, Lun:
  0000000000000000, 0

  <
- 31. Once the boot LUN is selected, the screen will appear as follows:

32. Press the escape to key to move up a menu.

Selected Adapter Type QLA23xx	Adapter I/O Address 2800	
	k.	
	Configuration Settings Host Adapter Settings Selectable Boot Settings Restore Default Settings Raw Nvram Data Advanced Adapter Settings Extended Firmware Settings	

33. Press the escape key again. You will be presented with the following options. Press Enter to save changes.

Sele Adapter Ty QLA23xx	cted Adapter pe I/O Address 2800
	Configuration settings modified       Save changes       Do not save changes
Use ≺Arrow keys>	to move cursor, <enter> to select option, <esc> to backup</esc></enter>

34. Arrow down to the Exit Fast!UTIL option, and press Enter.

Selected Adapter Type	I Adapter I/O Address			
QLA23xx	2800			
	Fast!UTIL Options			
	Configuration Settings Scan Fibre Devices Fibre Disk Utility Loopback Data Test Select Host Adapter Exit Fast!UTIL			



35. Select Reboot System (press Enter). This will cause a reboot of the server.

36. As the server is rebooting, you will see a screen that resembles the one below. Notice now that the QLogic adapter has now detected the presence of a Boot LUN.

Processor 2 initialized at 1.0 GHz/133 MHz with 256 Kbyte Cac	he
COMPAQ Integrated Smart Array Controller (ver 1.42) O Logic: 1785-Slot O Drive Array Not Configured No Drives Detected	al Drive(s)
QLogic Corporation QLA2312 PCI Fibre Channel ROM BIOS Version 1.29 Subsystem Copyright (C) QLogic Corporation 1993-2002. All rights reserve www.qlogic.com	m Vendor ID OB11 ed.
Press <ctrl-q> for Fast!UTIL ISP2312 Firmware Version 3.01.12 QLogic adapter using IRQ number 3</ctrl-q>	
Drive Letter C: is Moved to Drive Letter D: LOOP ID 129,3 is Installed As Drive C:	
Device Device Adapter Port Lun Vendor Product Number Type Number ID ID ID 80 Disk 0 Oll000 3 COMPAQ MSAl000 VOLUME ROM BIOS Installed	Product Revision 2.17

The server should now boot from the drives originally located on the internal Smart Array controller, now controlled by the MSA1000 (boot from SAN).

#### Considerations

If multiple servers were accessing a single StorageWorks MSA1000, best practices would dictate that you enable SSP (Selective Storage Presentation). SSP is an access control feature that allows multiple hosts running multiple applications on the SAN to have controlled access to MSA1000 storage on the SAN. This selective access allows policies to be set to determine which servers can access which storage, down to a logical volume level. SSP can be configured through several methods: Command Line Interface (CLI), ACU, or ACU XE.

## Appendix

#### **Migration Prerequisites and Migration Limitations**

- The Smart Array 5304 and 4200 controllers have 4 channels that can control up to 4 external chassis. While the MSA1000 also has 4 channels, only two are available externally, as two are used for the internal 14-drive shelf. For instance, if there is a single array on channel 1 and a single array on channel 2, and a third array that spans channels 3 and 4, the array that spans channel 3 and 4 will have to be migrated to a separate MSA1000. If you follow this method of migration, the MSA1000 may prompt you to **enable volumes (y/n)** and/or that MSA1000 may report that some drives/volumes are missing. Answer 'yes' to enabling the volumes and the migration will be complete. **Please Note: Once the drives have been migrated to the MSA1000**, you cannot fall back to the Smart Array controller and have the controller recognize the array / volume structures. The RAID Information Service (RIS) will be overwritten by the MSA1000, and the Smart Array controller cannot interpret it to recreate the array and volume structure ALL DATA WILL BE LOST.
- All arrays and volumes controlled by either a Smart Array controller or an RA4100 controller must be moved during the migration process. The DtS Architecture does not support a partial migration. Furthermore, do not attempt an operating system upgrade during the migration. Perform the DtS Migration first, verify that all volumes are available, perform and verify another Full Backup, then proceed with the operating system upgrade.
- Do not attempt a migration if one of the disk drives is marked as "Failed". Replace the failed disk drive and allow the array to be rebuilt before performing the migration.
- Do not attempt a migration if there are unconfigured drives in either the MSA1000 or attached StorageWorks Enclosures (Model 4314R / 4354R). These drives must either be configured or removed from the chassis for the migration to occur successfully.
- If you are migrating from multiple Smart Array controllers or RA 4100's, migrate one Smart Array controller or RA 4100 at a time. Move the drives or the drive shelf, and power on the MSA1000. Ensure that the MSA1000 (after full power up) detects the appropriate number of volumes. Power down the MSA1000, and migrate the next set of Smart Array / RA 4100 controlled drives or drive shelf. Again ensure that the MSA1000 (after full power up) detects the appropriate number of state appropriate number of migrated volumes. Please note and record drive and shelf location as well as array configurations (via ACU) before the migrations
- If migrating from an RA 4100 to the MSA1000, there will be two open drive slots. These slots can be filled with more drives, and a separate logical volume created on them.
- For cluster migrations, migrate the shared RA4100 storage first, and then migrate the Smart Array controlled drives (including boot drives), if you wish.
- If you have spare drives configured in your arrays, you may have to reassign the spare to your array (via ACU) after the migration procedure.
- In certain cases, Selective Storage Presentation (SSP) may have to be reconfigured when migrating from an RA4100 to the MSA1000.

#### **Dual Bus vs. Single Bus Drive Enclosures**

If you are migrating a dual bus drive enclosure that enclosure will occupy both external SCSI buses on the StorageWorks MSA1000. Please ensure which models you are migrating from and plan accordingly prior to the migration. Supported enclosures include the following models:

StorageWorks Enclosure Model 4314R (Maximum of two can be connected to the MSA1000)

190209-001

190209-B31 (Int'l)

190209-291 (Japan)

StorageWorks Enclosure Model 4354R (Maximum of one can be connected to the MSA1000) 190211-001 190211-B31 (Int'l)

190211-291 (Japan)

## MSA1000 fallback to RA4100 or Smart Array controllers

Follow these steps to restore your former configurations (Smart Array controlled volumes or RA 4100 controlled volumes) from the MSA1000:

- 1. Power down the server.
- 2. Remove the FCA2210 HBA.
- 3. Replace the FCA2210 HBA with the legacy controller (either the StorageWorks 64-bit/66-Mhz Fibre Channel Host Adapter or the Smart Array controller).
- 4. Migrate the disk drives back to the legacy RA 4100 or Smart Array controller, taking care to restore the drives to their position prior to the migration.
- 5. Power up the server, and perform the steps necessary in the Server's BIOS utility (F10 Setup or equivalent).
- 6. On reboot and load of operating system, install the drivers required for the legacy controller.
- 7. You must reassign and recreate the Array and Volume information through Array Configuration Utility (ACU). The legacy controller will not be able to read the restored Array and Volume information correctly. Therefore, you MUST enter the Array and Volume information EXACTLY as it was set up before the migration to the MSA1000 via ACU. This is why it is imperative that you note and record the Array information and Volume information PRIOR to performing the migration.
- 8. A reboot of the server will be required.