

Technical Note

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Contents

Configuring the StorageWorks MSA1000 for External Boot with **NetWare** Considerations3 Initial Steps4 Install Host Bus Adapter (HBA) in the Server.....4 Setup for RBSU Servers4 Setup for Servers without RBSU......4 Configuration of Volume(s) on MSA1000.....5 **Configuration of Boot BIOS** with Qlogic BIOS Utility9 Installation of Operating System19 Completing the OS install to the Server 19

Configuring the StorageWorks MSA1000 for external boot with NetWare – New Installations

Abstract: This technical note outlines step-by-step procedures for configuring the StorageWorks MSA1000, servers, and the FCA 2214 Host Bus Adapter for external boot.

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Considerations

Please read and understand the following:

• These steps and procedures are intended for an advanced user who has a solid foundation of knowledge in server hardware, storage hardware, and the NetWare operating system and installation

- These procedures currently apply only to Novell NetWare versions 5.x and 6.x
- All prerequisites and current scaling limitations for StorageWorks MSA1000 apply
- Do not use SmartStart to install OS on server
- Do not perform any configuration (using Array Configuration Utility) on internal drives until the installation of the operating system has been completed on the StorageWorks MSA1000
- These procedures assume a clean install on both the server and the StorageWorks MSA1000 in other words, both are new, out of the box and have not previously been configured

Initial Steps

Install Host Bus Adapter (HBA) in the Server

Install the HBA in an open slot in the server. Connect the appropriate fibre cables to the HBA and interconnect devices. Review the install documentation that came with the HBA or the Quick Install Guide (MSA 1000) for detailed instructions.

Setup for RBSU Servers

Boot the server from the ProLiant Smart Start CD-ROM version 5.3 or higher. As an alternative, you can download the latest ROM BIOS from http://www.compaq.com.
 Install the latest ROM from the Smart Start CD-ROM or the downloaded version.

- 3. Set the boot order:
 - a. While the system is booting, Press F9 to start the ROM Setup Utility.
 - b. Choose Boot Controller Order.
 - c. Select the primary HBA and move it to Controller Order 1.
 - d. Exit the utility.

Setup for Servers without RBSU

If your server does not have RBSU or the current system partition installed, perform the following steps:

- 1. Download and install the latest system ROM from the website: http://www.compaq.com.
- 2. Download SOFTPAQ SP18002.
- 3. Run the SOFTPAQ program to create an upgrade diskette.
- 4. Boot from the ProLiant Smart Start CD-ROM and run the program to clear the configuration.
- 5. Reboot from the new upgrade diskette. The ORD.EXE program should start automatically.
- 6. Set the Primary HBA to Position 1.
- 7. Reboot the server.

Configuration of Volume(s) on MSA1000

- 1. Power on server with HP StorageWorks Modular SAN Array 1000 Support Software CD in CD-Rom
- 2. After initialization the user will see Array Configuration Utility XE
- 3. A list of detected controllers is displayed on the left of the screen



ompaq Array Configuration Utility	XE - Microsoft Internet Explorer				_ 🗆 ×
СОМРАО	Array Config	uration Utility XE	DG(1	CPQ- GFBH2YN66 0.10.0.158	Help Exit
ontrollers Integrated Smart Arra	MSA1000 Controller in C	Compaq Demo MSA1000 Show Phys	sical View	Frequently Asked Questions	-
Controller in Embedde Slot		ed Drive at Box 1 : Bay 1		How do I start	
MSA1000 Controller in Compag Demo MSA100		ed Drive at Box 1 : Bay 2		controller?	
Rescan Controllers		ed Drive at Box 1 : Bay 3		Choose "Express	
Rescan controllers	18.2 GB Unassigne	ed Drive at Box 1 : Bay 4		Configuration", "Assiste Configuration" or	d
	18.2 GB Unassigne	ed Drive at Box 1 : Bay 5		"Advanced Configuratio by clicking on them.	n"
Charles and Charles		ed Drive at Box 1 : Bay 6		What does the gray	
18 - M.M. 19 - M.M. 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1		ed Drive at Box 1 : Bay 7	_	box in the middle show?	
1 M. H. M.		ed Drive at Box 1 : Bay 8	_	It shows a graphical	
	Refresh			representation of the configuration of your controller.	
	Select the method you woul	d like to use to configure your controller:		How can I get more information on one o the items in the gray box in the middle?	f
	Express Configuration	Asks you a few simple questions, then cor your controller.	nfigures	Click on the image of th item (except for unused space image) for which you would like more	le
1 Mar # 1 Mar		Allows you to configure your controller usi	ng a	information.	
PACTOR A	Assisted Configuration	series of wizards which guide you through process.	the	What if I want to	
18 - M.M. S M M.S	Advanced Configuration	Gives you the greatest flexibility in configu	uring	controller?	
		your controller.		Select the controller yo would like to configure the left.	n
States States				How do I refresh the view of my controlle	
				Click on the "Refresh	-

4. Select the MSA1000 Controller and choose Advanced Configuration

5. The array controller and available drives will be displayed. Select the array controller and click on **Create Array**



Compag Array Configuration Utility >	E - Microsoft Internet Explorer		
COMPAQ	Array Config Version 1.30.4.0	uration Utility XE	CPQ-Help DGGFBH2YN66 Help 10.10.0.158 Exit
Controllers Controllers Controller in Embedde Sidu Sidu Sidu Sidu Sidu Sidu Sidu Sidu	mfiguration View M8A1000 Controller in Co 18.2 GB Unassigned	Show Physical View mpaq Demo MSA1000 I Drive at Box 1 : Bay 1 I Drive at Box 1 : Bay 3 I Drive at Box 1 : Bay 3 I Drive at Box 1 : Bay 4 I Drive at Box 1 : Bay 5 I Drive at Box 1 : Bay 7 I Drive at Box 1 : Bay 8 I Drive at Box 1 : Bay 9 I Drive at Box 1 : Bay 9 I Drive at Box 1 : Bay 10 I Drive at Box 1 : Bay 10	Create Array A croster To avoid washing drive capacity, select physical Mores that are the same size for the new Array Select All I B.2 GB Drive at Box 1 : Bay 1 I B.2 GB Drive at Box 1 : Bay 2 I B.2 GB Drive at Box 1 : Bay 3 I B.2 GB Drive at Box 1 : Bay 4 I B.2 GB Drive at Box 1 : Bay 5 I B.2 GB Drive at Box 1 : Bay 7 I B.2 GB Drive at Box 1 : Bay 8 I B.2 GB Drive at Box 1 : Bay 9 I B.2 GB Drive at Box 1 : Bay 9 I B.2 GB Drive at Box 1 : Bay 9 I B.2 GB Drive at Box 1 : Bay 9 I B.2 GB Drive at Box 1 : Bay 9 I B.2 GB Drive at Box 1 : Bay 10 OK Cancel
Selender 🖸 🦳 😂 🧖 🗋 🐻 Chóinge	Compag Array C	oningu	🗳 🏷 🐳 🕕 10:32 AM

6. Select the drives to be included in the array and choose **OK**

7. Select the Create Logical Drive command





 Configuration of the MSA1000 is complete. Choose Save and then Exit. Close the browser window and the server will perform a reboot. Remove the StorageWorks Modular SAN Array 1000 Support Software CD from the CD-Rom and prepare to configure the boot BIOS in the next section.



8. Configure the volume with the Fault Tolerance and parameters desired and choose OK

Configuration of Boot BIOS with Qlogic BIOS Utility

As the Server typically will boot to an internal drive, the server has to be configured to boot via the Fibre Channel Host Bus Adapter. The following steps illustrate this.

- 1. Power on the server, and run the Server Vendors BIOS / Setup utility to install the adapter. Save the configuration, and Reboot.
- 2. As the server boots, the menu prompt for the HBA will display. Press <CTRL Q> to start the QLogic (Fast!UTIL) 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 Rbyte Cache
Processor 2 initialized at 1.0 GHz/133 MHz with 256 Rbyte Cache
COMPAQ Integrated Smart Array Controller (ver 1.42) 0 Logical Drive(s)
1785-Slot 0 Drive Array Not Configured
No Drives Detected
QLogic Corporation
QLA2312 PCI Fibre Channel ROM BIOS Version 1.29 Subsystem Vendor ID 0E11
Copyright (C) QLogic Corporation 1993-2002. All rights reserved.
www.qlogic.com
Press <CTRL-Q> for Fast!UTIL
```

3. At the QLogic main menu, select **Configuration Settings** (default) and press Enter



4. Select the first option Host Adapter Settings and press Enter.



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

Adapter Type QLA23xx	2800		
	Host Adapter Sett:	ings	
	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:	CC000 1.29 E40440 3 210000E08B0678B8 Disabled 2048 5 Disabled 0 Disabled	

Selecte Adapter Type QLA23xx	d Adapter I/O Address 2800		
	Host Adapter Set BIOS Address: BIOS Revision: Adapter Serial Mumber: Interrupt Level: Adapter Port Name: Host Adapter BIOS: Frame Size: Loop Reset Delay: Adapter Hard Loop ID: Hard Loop ID: Spinup Delay:	CC000 1.29 R40440 3 210000R08B0678B8 Enabled 2048 5 Disabled 0 Disabled	
Use <arrow ke<="" td=""><td>ys> and ≺Enter> to chang</td><td>e settings, <esc> to exit</esc></td><td></td></arrow>	ys> and ≺Enter> to chang	e settings, <esc> to exit</esc>	

6. Once the Bios is **Enabled**, the options will look like this:

7. Press the Escape key to back up one menu, and arrow down to **Selectable Boot Settings**, and press Enter to select it.



Ad	apter Type I/O Addre QLA23xx 2800	255	
۳	Selectable H	Boot Settings	
	Selectable Boot:	Disabled	
▦	(Primary) Boot Port Name Lun:	000000000000000000000000000000000000000	0
	Boot Port Name Lun:	000000000000000000	0
	Boot Port Name,Lun:	00000000000000000	0
	Boot Port Name,Lun:	00000000000000000	0
	Boot Port Name,Lun:	000000000000000	0
巖	Boot Port Name,Lun:	000000000000000	0
巖	Boot Port Name,Lun:	000000000000000	0
	Boot Port Name,Lun:	0000000000000000,	0
	Press "C" to clear a	a Boot Port Name entry	

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

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



10. 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	Rev	Port Name	Port ID
128	No devic	e present			
129	COMPAQ	MSA1000	2.17	500805F300011131	011000
130	COMPAQ	MSA1000	2.17	500805F300011031	011100
131	No devic	e present			
132	No devic	e present			
133	No devic	e present			
134	No devic	e present			
135	No devic	e present			
136	No devic	e present			
137	No devic	e present			
138	No devic	e present			
139	No devic	e present			
140	No devic	e present			
141	No devic	e present			
142	No devic	e present			

11. 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

		Select LUN		
	Selected devi	ce supports mult	iple units	
Adapte	LUN	Status		
QLA2			-	
	0	Supported		
	1	Not supported		
	2	Not supported		
	3	Supported		
	4	Not supported		
	5	Not supported		
	6	Not supported		
	7	Not supported		
	8	Not supported		
	9	Not supported		
	10	Not supported		
	11	Not supported		
	12	Not supported		
	13	Not supported		
	14	Not supported		
	15	Not supported		
	Use <pegelln pegedown<="" th=""><th>> keys to displa</th><th>v more devices</th><th></th></pegelln>	> keys to displa	v more devices	
	- ose drageop/ragebown	. Acys oo dispia	y more devices	
Use strrow ke	ave> to move cursor <	Enters to select	ontion <rec> to</rec>	heckup
USE ATION A	eyss co move cursor, s	Micer, co selecc	operon, aser co	о раскир

12. Once the Boot LUN is selected, the screen will appear as follows:

QLA23xx 2800	
Selectable	Boot Settings
Selectable Boot:	Enabled
(Primary) Boot Port Name,Lur	.: 500805 F 300011131, 3
Boot Port Name,Lur	.: 000000000000000, 0
Boot Port Name,Lur	.: 000000000000000, 0
Boot Port Name,Lun	.: 000000000000000, 0
Boot Port Name,Lun	.: 000000000000000, 0
Boot Port Name,Lun	1: 0000000000000000, 0
Boot Port Name,Lun	1: 0000000000000000, Q
Boot Port Name,Lun	1: 000000000000000, 0
Press "C" to clear	a Boot Port Name entry

13.	Press	the	Escape	Key,	and	Save	Changes.
			1	~ ~ ~			0

Å	Sele Mapter Ty; QLA23xx	cted Adap pe	ter— I/(0 Address 2800							
		Conf	iguratio Save (Do not	on settir changes t save ch	ngs mod: nanges	ified					
Use <ar;< th=""><th>row keys≻</th><th>to move</th><th>cursor,</th><th><enter></enter></th><th>to sele</th><th>ect o</th><th>ption,</th><th><≣sc</th><th>> to</th><th>backu</th><th>qu</th></ar;<>	row keys≻	to move	cursor,	<enter></enter>	to sele	ect o	ption,	<≣sc	> to	backu	qu

14. Press the Escape Key again, and select Exit Fast!UTIL

Adapter Type QLA23xx	I/O Address 2800		
	Fast!UTIL Opt:	ions	
	Configuration Set Scan Fibre Device Fibre Disk Utilit Loopback Data Te Select Host Adapt Exit Fast!UTIL	ttings es ty st ter	

15. Select the Reboot System option. The server will now attempt to boot from the volume controlled by the MSA1000.



16. As the Server is going through POST (Power On Self Test), you will see a screen like the one below, showing that the QLogic BIOS is active, and has a LUN to attempt to Boot from.

Processor 2 initialized at 1.0 GHz/133 MHz with 256 Kbyte Cache Integrated Smart Array Controller (ver 1.42) 0 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 ISP2312 Firmware Version 3.01.12 QLogic adapter using IRQ number 3 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 Product ID Number Number Type Number IDIDRevision 80 Disk 011000 3 COMPAQ MSA1000 VOLUME 2.17 ROM BIOS Installed

17. It is important to note that the Server will fail in attempting to Boot from this LUN, as no Operating System has yet to be installed on this boot Volume. See the following section, **Installation of Operating System** for the final steps.

Installation of Operating System

Completing the OS install to the Server

- 1. Install DOS on the boot disk. See your DOS Operating System Vendor's documentation for creating a bootable DOS partition.
- 2. Follow the standard NetWare instructions to begin the installation. Typically this is accomplished by loading the DOS CD ROM device drives, and at the CD Drive prompt, running the NetWare install (INSTALL.BAT).



3. At the Welcome to the NetWare server installation screen, select a Custom and New Server install. This is necessary to allow the QLogic drivers to be loaded at the proper time.



4. After several other install / interview questions, the install will begin, with a progression bar showing install status

		Fil	e Copy St	atus	
			58%		
Source pa Destinati	th: F:\; on path	STARTUP : C:\NWSERV	ER		
	om puom				
× 0 i					
->Copyin	g file	"DOSFAT.NDI	". "		
->Copyin ->Copyin ->Copyin	g file g file g file	"DOSFAT.NDI "DOSFAT.NSS "DSLOADER N	" . " . LM"		
->Copyin ->Copyin ->Copyin ->Copyin	g file g file g file g file g file	"DOSFAT.NDI "DOSFAT.NSS "DSLOADER.N "RDIT.NLM"	". ". LM".		
->Copyin ->Copyin ->Copyin ->Copyin ->Copyin	g file g file g file g file g file g file	"DOSFAT.NDI "DOSFAT.NSS "DSLOADER.N "EDIT.NLM". "ETHERTSM.N	". ". LM".		
->Copyin ->Copyin ->Copyin ->Copyin ->Copyin ->Copyin	g file g file g file g file g file g file g file	"DOSFAT.NDI "DOSFAT.NSS "DSLOADER.N "EDIT.NLM". "ETHERTSM.N "FDDITSM <u>.NL</u>	". ". LM". LM". N".		

5. At some point during the install, you will be notified of the detected drivers. When prompted, you will want to load additional drivers to support the QLogic HBA and the MSA1000. Arrow down to **Modify**, and press Enter. Arrow down to **Storage adapters:** and press Enter. The screen will look like this:



6. Press the **Ins** key to **Add an additional driver**. After pressing **Ins**, the screen will look like this:

NetWare Installation		
Select a driver	for each storage adapter in this server.	
AACRAID.HAM ADPT160M.HAM AFC9XXX.HAM AFCNW.HAM AHA2940.HAM V AIC78U2.HAM	Adaptec AdvancedRAID Controller Adaptec Ultral60 ASPI & SCSI Module Adaptec Fibre Channel Host Adapter AFC9xxx Module (HAM) Agilent-Technologies Fibre Channel Host Adapter AFCNW Module Adaptec AIC-7870 ASPI & SCSI Module Adaptec AIC-7890 ASPI & SCSI Module	
"Supported Hardware" AACRAID.HAM Adaptec AdvancedRAID Adaptec AdvancedRAID "Help" AACRAID.HAM When you load the driver, you need to tell it v (To scroll, <f7>-up <f8>-down)</f8></f7>		
Enter=Select a driver Ins=Add an unlisted driver Alt+F10=Exit Esc=Back F1=Help		

7. Press the **Ins** key again to **Add an unlisted driver**. After pressing the **Ins** key, the screen will look like this:



 From another machine, copy the NetWare HBA drivers from the MSA1000 Support Software CD for NetWare / Linux to a floppy (drivers are located in \HBA\NetWare\drivers subdirectory on the CD). Place the floppy diskette in the floppy drive, and press Enter. You will be presented with a list of possible drivers to load, select QL2300.HAM QLogic QLA2300 PCI Fibre Channel Host Bus Adapter, and press Enter.

```
NetWare Installation
Multiple drivers were found that support the following ADAPTER:
 PRODID: PCI.1077.2312.0E11.0100.02 BUS: PCI CLASS: UNKNOWN
 HINNAME: PCI.SLOT 1 HINNUMBER: 1 SUBCLASS: UNKNOWN
Select the driver (HAM) that best matches your system, or press F10.
   QL2300.HAM 🔰 QLogic QLA2300 PCI Fibre Channel Host Adapter Module
   QL2300D.HAM | QLogic QLA2300 PCI Fibre Channel Host Adapter Module
              "Supported Hardware" QL2300.HAM
                                                                 QLogic QLA2312 PCI Fibre Channel Adapter
              QLogic QLA2310 PCI Fibre Channel Adapter
              "Help" QL2300.HAM
              This HAM driver is for the QLogic QLA2300 family
                                                                 77
                      -(To scroll, <F7>-up <F8>-down)-
Enter=Select a driver
Alt+F10=Exit F10=Continue-no selection F3=Display full list
                                                                       Fl=Help
```

9. The install program will load the driver, and the screen will look like this: NetWare Installation



10. You will need to modify the Qlogic driver parameters, arrow down to the QL2300.HAM under **Driver name**, and press Enter. To modify the driver parameters. Press Enter on **Select/Modify driver parameters.**

NetWare Configuration				
QL2300 Param	leters			
	<u>à</u>			
Slot Number:				
Scan All Luns:	Yes			
Failback Enabled:	Yes			
Read Configuration:	Yes			
Requires Configuration:	No 🗰			
Report All Paths:	ies V			
Driver QL2300 Param	Driver QL2300 Parameter Actions			
Select/Modify driver parameters				
Save parameters and load driver				
Help <fl> Previous screen <esc> Change</esc></fl>	e Lists <tab> Abort <alt><f10></f10></alt></tab>			

11. Add slot number that corresponds to the slot number of the server where the HBA was installed.



12. That will add this device driver to the list to load. Select **Return to driver summary** and press Enter



13. Select Continue, and press Enter



14. Once **Continue** has been press, you will see a screen like the one below, where the Operating System is loading the drivers.



15. The installation will now continue normally. Depending on the hardware installed, you may or may not need to load additional drivers for Network adapters, etc. For this demonstration, it is assumed that no other drivers need to be loaded.

16. Finally, you will be asked to create the first NetWare volume – SYS. Chose the size of this volume, and follow the standard NetWare installation procedure to complete the installation. Note that the **Device** it is being created on is the MSA1000.

NetWare Installation				
	Volume SYS and Partition Properties			
	Device: COMPAQ 1	MSA1000 VOLUME rev:2.17 [V597-A3-D0:		
	Filesystem Type:	NSS		
	NetWare Partition Size	(MB): 4010.0		
	Volume SYS Size (MB):	4005		
	File Compression:	Off		
		Options		
		Continue Modify		
Alt+FI	Alt+F10=Exit F1=He.			

NetWare has now been successfully installed to a Boot LUN on the MSA1000