Hewlett-Packard VA 7100/7400 Microsoft[®] Cluster Services Installation Guide for HP Netservers



Version 1.0 October 12, 2001

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Contents

1	Overview	1
	General Information	1
	Document Description	1
2	Pre-Installation Requirements	2
-	Introduction	2
	Fauinment Required	2
	Applicable Documents/Reference Material	2
	Hardware Connections	2
	Local System Configuration	
~		
3	Configuring the virtual Array	5 5
	Introduction	5 F
	Virtual Array Operations	5 C
	Command View SDM Software Installation	0 6
		0
	Autoratin Setup	
	Create Permission File	20 21
		21 21
	Identifying World-Wide Node Names	
4	Create the Cluster Service Domain Account, Service Group, OU Group Policy	
	General Information	
	Preliminary Operation	
	General Information Preliminary Operations Account/Group Creation Procedure	23 23 24
5	General Information Preliminary Operations Account/Group Creation Procedure Node 1 (Primary Node) Configuration	23 23 24 31
5	General Information Preliminary Operations Account/Group Creation Procedure Node 1 (Primary Node) Configuration Introduction	23 23 24 31 31
5	General Information Preliminary Operations Account/Group Creation Procedure Node 1 (Primary Node) Configuration Introduction Preliminary Operations	23 23 24 31 31 31
5	General Information Preliminary Operations Account/Group Creation Procedure Node 1 (Primary Node) Configuration Introduction Preliminary Operations Configuration Procedure	23 23 24 31 31 31 31
5	General Information Preliminary Operations Account/Group Creation Procedure Node 1 (Primary Node) Configuration Introduction Preliminary Operations Configuration Procedure Cluster Setup	23 23 24 31 31 31 31 31
5	General Information Preliminary Operations Account/Group Creation Procedure Node 1 (Primary Node) Configuration Introduction Preliminary Operations Configuration Procedure Cluster Setup Introduction	23 23 24 31 31 31 31 31 31 33 38 38
5	General Information Preliminary Operations Account/Group Creation Procedure Node 1 (Primary Node) Configuration Introduction Preliminary Operations Configuration Procedure Cluster Setup Introduction Preliminary Operations	23 23 24 31 31 31 31 31 31 31 31 33 38 38
5	General Information Preliminary Operations Account/Group Creation Procedure Node 1 (Primary Node) Configuration Introduction Preliminary Operations Configuration Procedure Introduction Preliminary Operations Cluster Setup Introduction Preliminary Operations Cluster Setup Procedure	23 23 24 31 31 31 31 38 38 38 38 38
5 6 7	General Information Preliminary Operations Account/Group Creation Procedure Node 1 (Primary Node) Configuration Introduction Preliminary Operations Configuration Procedure Cluster Setup Introduction Preliminary Operations Cluster Setup Procedure Node 2 (Secondary/Passive Node) Configuration	23 23 24 31 31 31 31 31 38 38 38 39 46
5 6 7	General Information Preliminary Operations Account/Group Creation Procedure Node 1 (Primary Node) Configuration Introduction Preliminary Operations Configuration Procedure Cluster Setup Introduction Preliminary Operations Cluster Setup Procedure Node 2 (Secondary/Passive Node) Configuration Introduction	23 23 24 31 34 34 34 34 34
5 6 7	General Information Preliminary Operations Account/Group Creation Procedure Node 1 (Primary Node) Configuration Introduction Preliminary Operations Configuration Procedure Introduction Preliminary Operations Cluster Setup Procedure Node 2 (Secondary/Passive Node) Configuration Introduction Preliminary Operations	23 23 24 31 31 31 31 38 38 38 38 38 39 46 46 46
5 6 7	General Information Preliminary Operations Account/Group Creation Procedure Node 1 (Primary Node) Configuration Introduction Preliminary Operations Configuration Procedure Introduction Preliminary Operations Cluster Setup Procedure Node 2 (Secondary/Passive Node) Configuration Introduction Preliminary Operations Configuration Procedure	23 23 24 31 31 31 31 31 38 38 38 39 46 46 46
5 6 7	General Information Preliminary Operations	23 23 24 31 34

1 Overview

General Information

This document provides procedures for setting up a Windows 2000 cluster on a Hewlett Packard VA series highavailability platform, based on Windows 2000 Advanced Server.

The HP Surestore Virtual Array 7100/7400 is a SPOFless (no single point of failure) high-availability cluster solution for shared disk storage. This cluster contains dual-path components, including redundant Fibre Channel host bus adapters installed in the server nodes, Fibre Channel hubs, and Fibre Channel controllers installed in the external storage array. These components provide the high-availability features of this configuration, supplementing the fail-over capabilities of Microsoft cluster software.

Document Description

with its content.

This document contains step-by-step procedures that detail all processes involved in installing a clustered solution using the Advanced Server edition of the Windows 2000 operating system. Included in the document is a listing of the required hardware configuration, with more detailed descriptions of the hardware contained in referenced resource material and support documents. Finally, all steps necessary for RAID configuration of the external Fibre Channel storage array using HP Surestore Command View SDM software are provided in this document. The purpose of this document is to cover all necessary steps of each setup process (whether contained within this document or referenced to an external document) for a Windows 2000 cluster in an active/passive configuration on an HP server connected to the VA 7100/7400 in a dual-path configuration.

CAUTION	To properly install, set up, and configure a cluster, it is critical that this procedure be followed exactly. Failure to do so could result in improper operation of the cluster, loss of critical data, improper fail-over of the cluster, or even require complete re-provisioning and rebuild of the entire cluster. Follow the exact sequence of the steps as written, and do not skip any steps.
NOTE	Before beginning the installation procedures, review each step of the document to become familiar

2 **Pre-Installation Requirements**

Introduction

This chapter provides a sequence of pre-installation checks and tasks to be performed before beginning installation of the VA 7100/7400 disk array in a dual-path cluster configuration. These checks and tasks include the following:

- Equipment supplied
- Applicable documents/reference material
- Hardware connections
- Local system configuration

Equipment Required

The following list identifies all HP hardware and software required to assemble and install the VA 7100/7400 disk array product in a Windows 2000 cluster configuration. Before beginning the installation, perform an inventory to ensure that all items on the list are available and ready for use.

NOTE In the future, the components listed below will be supplied in kit form as part of the VA 7100/7400 Series Cluster kit

- Two HP servers, each with two NICs (four ports, total). HP server models currently certified are LH 6000, LT 6000r, and LXr 8500r.
- VA enclosure, containing two VA controllers
- CD containing the Surestore Command View SDM software and the associated Command View SDM Installation and User Manual
- Two HP D8602B Fibre Channel Host Bus Adapters (HBAs) per server.
- Two HP Fibre Channel hubs (Brocade A5667A or A5624A), or loop switches (HP P4459A).
- A dedicated Ethernet interconnect. This is the Ethernet controller that will be used for the crossover or heartbeat Ethernet cable.
- Gigabit interface connectors (GBICs). There should be ten GBICs, minimum. They will be inserted into each Fibre Channel interface connection, including both HBAs and hubs.
- Fibre Channel optical cables. There should be six fiber optic cables, minimum. They should be equal in length and color-coded. Do not mismatch color-coded (fiber cable type) cables.
- HP rail kits for each of the bundled hardware components and servers.
- Null modem cable

Applicable Documents/Reference Material

Included in the requirements to assemble and install the VA 7100/7400 disk array product in a Windows 2000 cluster configuration are three Hewlett Packard VA Series technical manuals and one VA configuration diagram. Before beginning the installation, perform an inventory to ensure that all documentation on the list below is available and ready for use.

NOTE	In the future, the documentation listed below will be supplied in kit form as part of the
	VA 7100/7400 Series cluster kit

- Hewlett-Packard Command View SDM Installation and User manual (supplied in both printed form and on Command View CD containing product software, refer to listing under Equipment Required). Also available in pdf format on HP SureStore Virtual Arrays 7100 /7400 User & Service Documentation website.
- Hewlett-Packard Secure Manager VA manual (available on Command View CD). Also available in pdf format on HP SureStore Virtual Arrays 7100 /7400 User & Service Documentation website.
- Hewlett-Packard AutoPath for Windows 2000 manual (available on Command View CD). Also available in pdf format on HP SureStore Virtual Arrays 7100 /7400 User & Service Documentation website.
- Hewlett-Packard VA Configuration poster (HP part/drawing number A5183-96130). Supplied with equipment and reference documentation.

The manuals provide instructions for interconnection of all components and interfaces, installation of software like Microsoft Cluster Server, and verification of proper installation and configuration of the cluster. The configuration poster has a detailed diagram that shows the entire VA layout, including all interfaces, connections, and descriptions.

NOTE Use the manuals and configuration poster as additional guides and information. Do not use the configuration poster and its instructions as replacements for the procedures of this document.

Hardware Connections

For cluster hardware interconnection, proceed as follows:

CAUTION Use of hardware not certified or approved by HP, unless specifically indicated in this procedure, may result in the improper operation of any or all components comprising the cluster. Different hardware, such as the FCAL or SCSI RAID controllers, HBAs, storage hubs, fabric switches, Fibre Channel GBICs, fiber optic cabling (short-wave or long-wave, distinguished by color coding), or server models may require additional configuration procedures, not contained in this document. Refer to the manuals and configuration poster described in the preceding paragraph for detailed information associated with the installation and configuration of vendor-specific hardware and/or software.

1. Disconnect the back-end and VPN (if applicable) network interfaces until after the cluster has been completely installed. They may be reconnected and configured later, but not until the procedures of this document have been completed.

CAUTION The storage array should be powered up before either server node is powered up. Also, power down both server nodes before the storage array is powered down.

2. For detailed hardware installation instructions, schematic diagrams, and component nomenclature, refer to the Command View SDM Installation and User manual, Secure Manager VA manual, AutoPath for Windows 2000 manual, and the VA Configuration poster described in the preceding paragraph.

CAUTION	It is critical that both server nodes be set up exactly the same; that is, identical components should
	be used and installed in identical locations on both nodes.

- Following the directions in the Command View SDM Installation and User manual, Secure Manager VA manual, and AutoPath for Windows 2000 manual, set up the VA external storage array, Fibre Channel storage hub or switch, GBIC interface converters, and the cables for each node.
- 4. Using the VA Configuration poster, attach the servers to the storage hub.

Local System Configuration

The remainder of this procedure assumes that both HP Netservers have been configured with Microsoft Windows 2000 Advanced Server operating system and the latest service packs. For more information about installing Microsoft Windows 2000 software on HP Netservers, refer to the HP information library on the website

http://www.hp.com/netserver

3 Configuring the Virtual Array

Introduction

This chapter contains detailed instructions for setup and configuration of the virtual array.

Preliminary Operations

The following preliminary operations must be successfully completed before beginning the Virtual Array Setup and Configuration Procedure.

- 1. Ensure that all requirements detailed in chapter 2 have been thoroughly reviewed and successfully completed.
- 2. Storage array is powered up.
- 3. Node 1 (primary node) is powered up and running.
- 4. Verify that all network cables and fiber cables are connected correctly and securely. The HBAs should display a flashing green light and a constant orange light. The orange light indicates that a link has been established.
- 5. The CD included in the VA equipment shipment should contain Surestore Command View SDM software. Refer to the Equipment Required paragraph of chapter 2. This CD contains all required management software.
- 6. If applicable, the local RAID disk arrays on both nodes and external storage array must be configured identically. For example, use the same driver letters and labels for local hard drives, CD-ROMs, and drives on the external disk storage array. Otherwise, the cluster will not function after fail-over from active node to passive node. Refer to the Hardware Connections paragraph of chapter 2.
- 7. If applicable, ensure that the Backend and VPN network interfaces are disconnected. They can be reconnected at the completion of this procedure. Refer to the Hardware Connections paragraph of chapter 2.

CAUTION	The storage array should be powered up before either server node is powered up. Also, power down both server nodes before the storage array is powered down.
NOTE	Ensure that the latest version of the HP Surestore Command View SDM software is being used. Refer to the Equipment Required and Applicable Documents/Reference Material paragraphs of chapter 2.

Virtual Array Setup and Configuration Procedure

To perform the virtual array setup and configuration process, proceed as follows:

Command View SDM Software Installation

- 1. Connect a null modem cable to one of the controllers in the VA. As shown below, the settings are as follows:
 - o Bits per second: 9600
 - o Data bits: 8
 - o Parity: None
 - o Stop bits: 1
 - o Flow control: None

Then, click OK.



2. Referring to the window shown below, type **vfpfmt** at the Ready prompt, then strike the **Enter** key on the keyboard. At the following (yes/no): prompt, type **yes**, then strike the **Enter** key on the keyboard.

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	File Edit View Call Ti	ransfer Help						
	D 🚅 🔊 🎗 🗈	rel 🔊						
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My Network Places	Ready > ∨fpfmt Format Array. Clear	ALL data? (ye	s∕no):yes					
Recycle Bin								
Explorer	Connected 0:01:01	Auto detect	9600 8-N-1	SCROLL	CAPS	NUM	Capture	
Acrobet Reader 4.0 Shortcut to 15.18.116	,							

 Insert the CD containing the HP Surestore Command View SDM software in the CD-ROM drive. On the Windows 2000 desktop, click the desktop Start -> Settings -> Control Panel to obtain the Control Panel window, as shown below. In the Control Panel window shown below, click Add/Remove Programs.

🗟 Control P	Panel						_	. 🗆 🛛
 	<u>V</u> iew F <u>a</u> vor	rites <u>T</u> ools <u>H</u>	<u>i</u> elp					-
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Accessibility Options	Add/Remove Hardware	Add/Remove Progra Technell	Administrative	Date/Time	Display	Folder Options	Fonts	
~1	-	Install	s and removes	c programs and	windows compo	nencs	5.00	
2				Ő.	E	<u></u>	ų	
Game Controllers	Internet Options	Keyboard	Licensing	Mouse	Network and Dial-up Co	Phone and Modem	Power Options	
3	S	A	0					
Printers	Regional Options	Scanners and Cameras	Scheduled Tasks	Sounds and Multimedia	System			
ı Installs and re	moves programs	and Windows co	mponents					11.

4. On the Add/Remove Programs window shown below, select the Add New Programs icon, then choose the CD or Floppy option.



My Documents		
	🗧 cysdm nt 831	
My Computer	File Edit View Favorites Tools Help	
	Address C cvsdm_nt_831	▼ ∂60
My Network Places		
8	cvsdm_nt_831	
Recycle Bin	RunInst Windows NT Command Script	
e	Modified: 1/30/2001 8:37 AM Size: 9.89 KB	
Explorer	Attributes: Read-only	
Acrobat		
Reader 4.0		
Shortcut to 15.18.116		
	Type: Windows NT Command Script Size: 9.89 KB 9.89 KB 9.89 KB	🖳 My Computer 🥢

5. On the Command View CD window shown below, click **RunInst**.



6. On the InstallShield Wizard for hp command view sdm window shown below, click Next.

7. On the License Agreement window shown below, click the I accept the terms in the license agreement button, then click Next.



8. On the **Minimum Requirements** window shown below, verify that the six settings are checked as shown. Then, click **Next**.

<u></u>		
My Documents		
	Sucyedmint 831	
	🖼 Running "hp commandview sdm" Installer	
My Computer	stop or 🖟 hp command view sdm setup	
	Stopp of Checkin Stoppin The Ope Minimum Requirements: Your system must meet the following minimum requirements in order for the software to run properly:	Go
My Network Places	Administrators Privileges	
1	stop Ho 🗹 Windows 2000 Checkin	
Recycle Bin	Stoppin 🗹 128 Megabyte RAM	
	The Hos 👽 Processor Speed 350 MHz or better	
	Screen resolution at least 800x600	
S	Now Spa	
Internet Explorer	~	
Acrobat Reader 4.0	Note: Requirements shown without a checkmark are not currently met on this system. You must have Administrators privileges and you must have either Windows NT 4.0 (SP 5) or Windows 2000 installed on this system before you can proceed. (The lower four requirements in the list are to ensure a proper level of performance.)	
	hp command view sdm	
	< <u>Back</u> Cancel	
Shortcut to 15.18.116		
	Type: Windows NT Command Script Size: 9.89 KB 9.89 KB 9.89 KB 🤤 My Co	mputer //

9. The **Installing hp command view sdm** window as shown below appears and begins the software installation. It may require several minutes to complete the installation, however. Observe the Status bar in the displayed window. When the software installation is complete, click **Next**.

	Running '	"hp comma	andview sdm" Installer		
puter -	top Op 🎼	hp comm	and view sdm Setup		<u>^</u>
- ċ	heckin	Installing	hp command view sdm		_
S T	toppin he Ope	The prog	ram features you selected are being installed.		
work T	he Ope		Please wait while the InstallShield Wizard installs ho command view sdm.		
• >> \$	top Ho	17	This may take several minutes.		
j <mark>c</mark>	heckin		Status:		
e Bin 🛛 👖	toppin he Hos				
S 1	he Hos				
) N	ow Spa				
net rer					
•					-
pat 📕					
1	h	p command v	view sdm		
J			< Back Next > Ca	ncel	
ut to	_				



10. On the InstallShield Wizard Completed window shown below, click Finish.

11. The Starting HostAgent window shown below appears, and remains for a few minutes.

<u></u>		
My Documents		
	Starting HostAgent	
My Computer	Stopping OpenDial The OpenDial service is stopping The OpenDial service could not be stopped.	
	stop Hostagent ************************************	
My Network Places	Checking for HostAgent Stopping HostAgent The HostAgent service is stopping. The HostAgent service was stopped successfully.	
Recycle Bin	Now Spawning "hp commandview sdm" Installer	
Internet Explorer	start Hostagent ************************************	
Acrobat Reader 4.0	Allowing 1 minute for HostAgent startup to complete	_
Shortcut to 15.18.116		
hp command view sdm		

12. The **Command Prompt** window appears as shown below. The term **armdiscover** appears at the first C-prompt of the window display, followed by a set of device (**First VA**) characteristics, as shown.



- 4y Documents 🕷 "hp commandview sdm" installation succeeded _ 🗆 🗵 4v Compute * Allowing 1 minute for HostAgent startup to complete.... 68 tart OpenDial ******* tarting OpenDial... he OpenDial service is starting. he OpenDial service was started successfully. My Networ Places 8 tart armdiscover ******************************** itarting armdiscover... 'his may take a few minutes, please be patient... 'java.exe' is not recognized as an internal or external command, operable program or batch file. 'java.exe' is not recognized as an internal or external command, operable program or batch file. 'manual manufication of the second 'manual second e Internet Explorer 'hp commandview sdm" install completed 4 ess any key to continue Acrobat Reader 4.0 Shortcut to 15.18.116... 4 62 hp command view sdm
- 13. On the desktop display shown below, click the hp command view sdm icon.

14. The **hp command view sdm launcher** window appears, as shown below. This window shows the devices (and their characteristics) that the Command View SDM software has found. Click the **FirstVA** icon on the display.



15. The **hp command view sdm** window appears. If necessary, click the **Identity** tab to obtain the VA identity display as shown below. Then, click the **LUN Management** tab.



- 16. The display of the **hp command view sdm** window under the **LUN Management** tab appears. Use the display as shown below to create the following LUNs, as required:
 - a. Create a LUN 0 to be a 10-MB partition (this LUN will not be managed by the cluster).

NOTE	The VA needs LUN 0 so that Microsoft Cluster can see LUNs over number 7
------	---

- b. Create the desired (user-definable) quorum LUNs.
- c. Create the desired (user-definable) data LUNs.

<u></u>								
My Documents								
	bp command view	w sdm						
My Computer	😑 Status: Re	eady					Refresh	
	Cassini Hi	gh-end Controller - Exc	aliber					
My Network	Identity	Status	LUN Management	Configuration	Diagnostics	Download	Performance	
Places	Logical LUNs	Business Copy	Capacity			Size (GB)	Create	
Doguelo Pin	0 0%					0.010		
Ketytie bin	1 0% 2				0%	0.500	Permissions	
0							Delete	
Internet Explorer								
WinZip								
Start HP Auto								
Path Server								
Start HP Auto Path Client								
49			Available Storage	468.246 GB				
hp command view sdm								
nov som								
Start 7	1 🍊 😭 🗌 🔍 hn co	mmand view sdm						10:55 AM
	Ill							

AutoPath Setup

To set up AutoPath for Windows 2000, proceed as follows:

- 1. Ensure that AutoPath for Windows 2000 software has been installed. Refer to the Hardware Connections and Applicable Documents/Reference Material paragraphs of chapter 2.
- 2. On the desktop display, click the **Start HP Auto Path Server/Client** icon. The **HP AutoPath Adapters** window appears, as shown below. Verify that the Fibre Channel host adapters are listed under Adapter # and Adapter Name. Then, click **Devices**.

				-
Path Control Panel	Ø	Server Na	ume localhost	
Adapters	Adantar State	# of Paths	Adapter SCSI Port #	
Integrated HP NetRAID Agilent HHBA-510x PCI Fibre Channel Controller	Active Active	0	4	
Agilent HHBA-510x PCI Fibre Channel Controller				
	Path Control Panel Adapters Adapter Name Integrated HP NetRAID Agilent HHBA-510x PCI Fibre Channel Controller Agilent HHBA-510x PCI Fibre Channel Controller	Path Control Panel Image: Control Panel Adapters Adapter state Adapter Name Adapter State Integrated HP NetRAID Active Agilent HHBA-510x PCI Fibre Channel Controller Active Agilent HHBA-510x PCI Fibre Channel Controller Active	Adapters Adapter State # of Paths Adapter Name Adapter State # of Paths Integrated HP NetRAID Active 0 Agilent HHBA-510x PCI Fibre Channel Controller Active 3 Agilent HHBA-510x PCI Fibre Channel Controller Active 3	Adapter s Server Name Incalhost Adapter s Adapter State # of Paths Adapter SCSI Port # Integrated HP NetRAID Active 0 4 Agilent HHBA-510x PCI Fibre Channel Controller Active 3 5 Agilent HHBA-510x PCI Fibre Channel Controller Active 3 6

3. The **HP** AutoPath - Devices window appears, as shown below. Verify that those VA LUNs that have been configured are listed under Device # and Device Name. Then, click on one of the devices listed.

🙆 HP Auto	Path	- Devices							
HP	Auto	Path Cont	rol Panel			~/~ 0	Server Name	Incalhost	Ţ
							Disk Array	00USP1001113	
Device	s	Adapters							
Device#	Dev	ice Name		Serial#	State	# of Paths	Load Balance Policy	Preferred Path #	
1	HP	A6189A	EX22	004N50G008000	Active	2	No Load Balancing	1	
2			EX22	004N50G000000	Active		Shortest Queue ServiceTime		
3			EX22	004N50G004000	Active		No Load Balancing		

4. Click on **Device Settings** and observe that the **Device Settings** window for the selected LUN is displayed as shown below. On the display below, use the pull-down menu to select the desired **Load Balancing Policy**.

bevice Settings	5							X
Server Name:	node2clstr1	Device Serial#:	0041	V50G00800	00000090	Load Balancing Poli	cy.	Shortest Queue ServiceTin 🔻
Disk Array Unit:	00USP100111:	Device Name:	ΗP	A6189A	EX22	Preferred Path Num	ber;	No Load Balancing DefaultBalancePolicy Round Robin Shortest Queue Requests
Path Number		State	_		Controller	Port#	Por	Shortest Queue Bytes Shortest Queue ServiceTime
1 2		Active Active			1000 1000		5.0.0 6.0.0).2).2

- 5. Repeat steps 3 and 4 for each LUN that has been configured.
- 6. AutoPath configuration is now complete.

Secure Manager Setup

To set up Secure Manager for Windows 2000, proceed as follows:

1. Ensure that Secure Manager for Windows 2000 software has been installed. Refer to the Hardware Connections and Applicable Documents/Reference Material paragraphs of chapter 2.

NOTE	Secure Manager is not required if this cluster is the only host communicating with the virtual array.
	If there are other hosts or clusters in the system, Secure Manager is required.

- 2. To enable Secure Manager, proceed as follows:
 - a. Open a DOS window, and type the following:

```
armfeature -a -f LUN_SECURITY_xxGB -k <LicenseKey> <SerialNUMBER>
```

b. To ensure that the Secure Manager feature has been installed, type the following:

```
Armfeature -r <serialnumber>
```

Create Permission File

An ASCII permission file for the disk array to read must be created. Permission file structure and definitions are detailed in the following steps:

1. The listing below is an example of a Permission file.

NODEWWN	50060b0000203cb	1	CW	
NODEWWN	50060b00000203cb	0	CW	
NODEWWN	50060b00000202f1	1	CW	
NODEWWN	50060b0000202f1	0	CW	
NODEWWN	50060b000002076d	0	0	
NODEWWN	50060b000002076d	1	0	
NODEWWN	50060b000002120b	0	0	
NODEWWN	50060b000002120b	1	0	

- 2. In the listing of step 1 above, the indicator NODEWWN specifies the host adapter. The 16-character number that follows is the World Wide node address
- 3. The first number after the node address (0 or 1, in this case) identifies the specific LUN to which permissions are being granted.
- 4. The final character set of each entry is the indicator for type(s) of permissions. Types of permissions are:
 - o C Configure
 - o W Write
 - o R Read
 - o 0 None
- 5. As shown in the listing of step 1, permissions (CW) have been granted to LUNs 0 and 1 of four host adapter nodes, and no permissions (0) have been granted the other four host adapter nodes. The cluster host bus adapters get full access to LUNs 0 and 1, and the other host bus adapters get none.

Load Permission File

To load the permission file, proceed as follows:

1. Open a DOS window, and type the following:

```
armsecure -w -c -f c:\temp\mysecure -p <password> <serialnumber>
```

```
where
-w is for write
-c is for clear
-f is for the file
-p is for the password
```

- 2. The disk array responds with a message indicating that the array has updated the security.
- 3. Type the following:

armsecure -e -p <password> <serialnumber>

4. Secure Manager is now enabled.

Identifying World-Wide Node Names

The simplest method to identify world-wide node names is to use the Brocade switches (refer to the Equipment Required listing in chapter 2).

1. Open a browser, and enter the IP address of the Brocade switch in the disk array system.

NOTE There may be two Brocade switches in the disk array system. In that case, enter the IP address of each Brocade switch in the system.

2. Click on the **Name Server Table** tab of the display as shown below, and observe the world-wide node name (circled) for each node.

Name Server	Table Sh	ow - Micros	oft Internet	Explorer	/		-
Name Server	r Table esh Auto)-Refresh li	nterval <mark>15</mark>	Seconds	Refresh		
Domain #	Port#	Port ID	Port Type	Port WWN	Node WWN	Symbolic Name	
1	0	011000	N	50:06:0b:00:00:02:07:6c	50:06:0b:00:00:02:07:6d	NULL	
1	1	011100	N	50:06:0b:00:00:09:99:42	50:06:0b:00:00:09:72:82	[28] "HP A6189A	EX22"
1	3	011300	Ν	50:06:0b:00:00:02:03:60	50:06:0b:00:00:02:03:61	NULL	
1	5	011500	Ν	50:06:0b:00:00:02:06:8c	50:06:0b:00:00:02:06:8d	NULL	
1	6	011600	Ν	50:06:0b:00:00:02:12:0a	50:06:0b:00:00:02:12:0b	NULL	
1	7	011700	Ν	50:06:0b:00:00:09:99:4e	50:06:0b:00:00:09:72:69	[28] "HP A6189A	EX22"

3. The Virtual Array Setup and Configuration Process is now complete. Proceed to Create the Cluster Service Domain Account, Service Group, and OU Group Policy of chapter 4.

4 Create the Cluster Service Domain Account, Service Group, OU Group Policy

Introduction

This procedure of this chapter should be performed by a Network Administrator, familiar with Windows 2000 Group Policies and Security.

General Information

The cluster service on each cluster node will run under the security context of a domain user account. This account must be created in the customer organizational unit (OU) and named OUName clusteradmin. In addition, a new user group called OUName Cluster Group must be created in the customer OU (ensure that the Group Scope is set to **Global** and the Group Type is set to **Security**). This user account must have the following local rights on each cluster node:

- Act as part of the operating system
- Back up files and directories
- Increase quotas
- Increase scheduling priority
- Load and unload device drivers
- · Lock pages in memory
- Log on as a service
- Restore files and directories

These local rights will be implemented via a Group Policy created later in this chapter.

NOTE Ensure that the customer OU already exists. It should have been created when the first server for the customer site was provisioned. Do not manually create the OU.

The domain user account (OUName clusteradmin) to be created can also be used for the SQL server service and SQL server agent service in the SQL server cluster environment (unless the Local System account is used instead). The new user group (OUName Cluster Group) to be created is a global security group and will initially have only one member, the domain user account OUName clusteradmin. The global security group, however, is a container designed to hold additional cluster user accounts. If the customer installs additional clusters into their architecture, this group will already have the appropriate user rights set by a Cluster GPO, and no additional security changes will be required. This group (OUName Cluster Group) must also be made a member of the **Service Accounts** universal security group located in the user container for the domain.

Preliminary Operations

Ensure that all requirements detailed in chapters 2 and 3 have been thoroughly reviewed and successfully completed before proceeding to the Account/Group Creation Procedure.

Account/Group Creation Procedure

To create the domain user account and the new user (global security) cluster group, proceed as follows:

- Log in to a machine that belongs to the domain where the cluster is being installed, or log in to the domain controller itself. Go to Start, Programs, Administrative Tools, then click Active Directory Users and Computers. Ensure that the domain that appears is the correct one; if not, right-click on Active Directory Users and Computers, and click Connect to Domain. Enter the domain that the cluster is in, and click OK.
- 2. Locate the customer OU. In this procedure, the customer OU name is Genuity.

```
NOTE The OUName associated with the accounts and groups of this chapter should be abbreviated as necessary to ensure that its length does not exceed the maximum numbers of characters allowed. The OUName is user-definable, but is designated Genuity in the examples of steps 3 through 14 of this procedure.
```

3. Right-click the customer OU (*Genuity*), and click **Create New**. Select **User**. Name the new user account clusteradmin

(Genuity clusteradmin). Select the Password never expires option and User cannot change password options.

- 4. To create the cluster group, right-click the OU (*Genuity*), and click Create New. Select Group. Ensure that the Group Scope Global and Group Type Security radio buttons are selected. Name the new group Cluster Group (*Genuity* Cluster Group).
- 5. As shown below, the **clusteradmin** account and the **Cluster Group** are highlighted in the display pane in blue. The actual cluster group created will also have the customer OUName associated with the cluster group; in this example, *Genuity* Cluster Group.

🚡 Console1 - [Console Root\Active Directory Us	ers and Computers [e	eh072c1850.NTENG.NC 💶 🗖 🗙
∫ 🚰 ⊆onsole Window <u>H</u> elp		D 📽 🖬 💷 💷 🏼
Action View Eavorites ← → € 💽	🗙 🗟 😫] 🦉	🖥 🖄 🖓 🍕 🐌
Tree Favorites	Name	Type Descripti
Console Root	Е ВН100	Computer
Active Directory Users and Computers [eh07	EH098C1850	Computer
TENG.NCS.BBNPLANET.com	EH104C6400	Computer
🗄 😡 ABCCorp	EH105C6400	Computer
🗄 🧭 🔯 AriTest	EFAB2K	Computer
🗄 🖳 Builtin	Genuity	Security Group Genuity
🕀 🔯 Commerce Server	🙎 Genuity_c1	User
🕀 💼 Computers	🕵 Genuity_c2	User
🗄 🧭 Domain Controllers	🙎 Genuity_c3	User
		Computer
	👷 clusteradmin	User
	Cluster Group	Security Group
ForeignSecurityPrincipals		
	 ∙	Þ

6. After the account has been created and made a member of the cluster group, ensure that it is not a member of any other group. Right-click the user account, go to **Properties**, then the **Members of** tab. Click **Add**, and add the account to the group just created called **Cluster Group** (*Genuity* Cluster Group). As shown below, click on **Cluster Group** to highlight it, and then click **Set Primary Group**. Membership in all other groups can now be removed.

Remote cont	trol Terminal Services Profile
General Address	Account Profile Telephones Organization
Member Of	Dial-in Environment Sessions
Member of:	
Name	Active Directory Folder
Cluster Group	NTENG.NCS.BBNPLANET.com/Genuity
Domain Llears	NTENO NOO BONDI ANET
Doundin Oseis	NTENG.NUS.BBNPLANET.com/Users
Add	Remove Domain Users

 Highlight all group(s) that the account is a member of except Cluster Group (*Genuity* Cluster Group), and click to remove those group names. Then, select OK. This should leave only the newly-created Cluster Group (*Genuity* Cluster Group), as shown below.

Remote contr	ol	Τe	erminal Services	Profile
General Address	Account	Profile	Telephones	Organization
Member Of	Dial-in	Envi	ronment	Sessions
Member of:				
Name	Active Direct	ctory Folder		
Cluster Group	NTENG NC	S.BBNPLA	NET.com/Gen	uity
Add	<u>R</u> emove			
Primary group: C	Cluster Group			
Set Primary Group	There is	no need to e Macintos	change Primar h clients or POS	y group unless IX-compliant

- **NOTE** The following step places the newly-created **Cluster Group** (*Genuity* Cluster Group) into the domain-level group called **Service Accounts**.
- 8. In the customer OU (*Genuity*), right-click **Cluster Group** (*Genuity* Cluster Group), and select **Properties**. Then, click the **Members of** tab. Click **Add**, and select **Service Accounts**. Ensure that the **Service Accounts** group is associated with the hosting domain folder (**NTENG.NCS.BBNPLANET.com/Users**), as shown below. (In the example below, the hosting domain designation is **NTENG.NCS**, and the hosting domain zone is **BBNPLANET.com**.) Then, click **OK**.

Select Groups		? ×
Look in: DI NTENG.NCS.BBNPLANET.	СОМ	-
Name	In Folder	
EH082C1850 Browsers	NTENG.NCS.BBNPLANET.com/Users	
🕵 Schema Admins	NTENG.NCS.BBNPLANET.com/Users	
🚮 Enterprise Admins	NTENG.NCS.BBNPLANET.com/Users	
🕵 Customer Managed	NTENG.NCS.BBNPLANET.com/Users	
🕵 CoManaged	NTENG.NCS.BBNPLANET.com/Users	
Service Accounts	NTENG.NCS.BBNPLANET.com/Users	
		•
Add <u>Check Names</u>		
	OK	Cancel

9. As shown below under the **Member Of** tab of the **Cluster Group Properties** window, observe that the **Cluster Group** (*Genuity* Cluster Group) is a member of only the **Service Accounts** group. Then, click **OK**.

Name	Active Directory Folder
Service Accou	Ints NTENG.NCS.BBNPLANET.com/Users
and the second s	The second s

- **NOTE** The following steps create a GPO at the OU level to contain the security policy settings that will be applied locally to each cluster node. This will ensure that the local computer **User Rights Assignments** settings are correctly modified to assign proper permissions to the **clusteradmin** (*Genuity* clusteradmin) account.
- Right-click the customer OU (*Genuity*), then click **Properties**. Under the **Group Policy** tab of the **Genuity Properties** window shown below, click **New**. Name the policy **Cluster Group**

(Genuity Cluster Group), then click Edit to modify the GPO.

eneral Manag	ed By Group Po	olicy]		
Cur	rent Group Policy	Object Links fo	r Genuity	
Group Policy ()bject Links		No Override	Disabled
Chuster Gro	UD			
Group Policy C	up viects bigher in the	e list have the h	iahest prioritu	
Group Policy Ob Group Policy Ob This list obtained	up ijects higher in the d from: eh072c18	e list have the h 50.NTENG.NC	ighest priority. 5.BBNPLANET	.COM
Group Policy Of Group Policy Of This list obtained <u>N</u> ew	up ijects higher in the d from: eh072c18 <u>Ad</u> d	e list have the h 50.NTENG.NC <u>E</u> dit	ighest priority. 5.BBNPLANET	. сом Цр

11. When the **Group Policy** window shown below opens, in the left-hand pane, click **Windows Settings** beneath **Computer Configuration**. Then, click **Security Settings**, **Local Policies**, and finally **User Rights Assignment**. This is a machine policy that applies to any user who logs into the machine, although due to policy object settings, it will only make a difference to the user in the **Cluster Group** (*Genuity* Cluster Group).

🗖 171.78.217.7 - Terminal Services Cli	ent	
group Policy		▲ × □ -
<u> A</u> ction ⊻iew ← → 🖭 💽	× 🖷 🖻	
Tree	Policy	Computer Setting 🗸
Eluster Group [eh072c1850.NTENG.NCS	Boot and unload device drivers	NTENG\Enterprise Admins,NTENG\Domain Admins,NTENG\C
😡 Computer Configuration	Act as part of the operating s	NTENG\Cluster Group
🗄 💼 Software Settings	👸 Back up files and directories	NTENG\Cluster Group
🛱 📲 Windows Settings	👪 Increase quotas	NTENG\Cluster Group
Scripts (Startup/Shutdown)	🔀 Increase scheduling priority	NTENG\Cluster Group
🖻 📴 Security Settings	🔀 Lock pages in memory	NTENG\Cluster Group
🗄 🛃 Account Policies	🕮 Log on as a service	NTENG\Cluster Group
E	BBRestore files and directories	NTENG\Cluster Group
E Audit Policy	Computer from th	Not defined
	🔀 Add workstations to domain	Not defined
E Security Options	🔀 Bypass traverse checking	Not defined
	🐯 Change the system time	Not defined
Hand Restricted Groups	🔀 Create a pagefile	Not defined
	🔀 Create a token object	Not defined
	🐯 Create permanent shared obj	Not defined
	🔡 Debug programs	Not defined
	BB Denv access to this computer	Not defined
	•	<u>•</u>
•		

12. To edit a policy setting, right-click on the policy setting to be modified (in the right-hand pane of the Group Policy window shown in step 11), and select Security. This opens the Security Policy Setting window, as shown below. Click the Define these policy settings checkbox, then click the Add button. This opens another window containing names of various cluster groups, and a Browse button. In this window, click the Browse button, and select the newly-created (*Genuity*) Cluster Group. Then, click OK in the Security Policy Setting window shown below. Note that the term Cluster Group appears in the display field, preceded by hosting domain designation NTENG. Thus, in the window below, the display field is NTENG\Cluster Group.

Security Policy Setting	? ×
Act as part of the operating system	
Define these policy settings NTENG\Cluster Group	
Add <u>R</u> emove	
	OK Cancel

- 13. Perform step 12 above to edit the policy setting for each of the following user rights:
 - Load and unload device drivers
 - Act as part of the operating system
 - Back up files and directories
 - o Increase quotas
 - Increase scheduling priority
 - Lock pages in memory
 - Log on as a service
 - Restore files and directories

In the right-hand pane of the **Group Policy** window shown in step 11, each of the above user rights must contain the term **Cluster Group**, preceded by the hosting (**NTENG**) domain designation. In the case of **Load and unload device drivers**, the following two groups must also be specified:

- o Enterprise admins
- o Domain admins

NOTE The **Security Policy Setting** window shown in step 12 is an example of what policy settings should look like for all user rights explicitly defined, with the exception of **Load and unload device drivers**.

- 14. When all user rights listed in step 13 have been defined, close the **Group Policy** window shown in step 11, and then click **OK** in the **Security Policy Setting** window shown in step 12.
- 15. If logged into the domain controller, log off at this time.

- **NOTE** The following two steps are to be performed locally on each cluster node. Log on to each node individually to perform these steps.
- 16. Open the directory C:\winnt\system32\group_policy. Set the Permissions on the gpt.ini file by right-clicking on the file, select Properties, and then go to the Security tab. Click Add, select Service Accounts, then click OK. Set the Permissions for the Service Accounts group to explicitly deny Read & Execute, and Read access, as shown below. Then, click OK.

	IT\system32\GroupPolicy
<u> </u>	t Yiew Favorites Iools Help
🖉 🗢 Back	🔹 🖘 💼 🔞 Search 🖓 Folders 👹 History 🛛 🕆 🗙 🗤 🗐 🕇
Address	C:\WINNT\system32\GroupPolicy
Machine	gpt.ini Properties
🔜 User 🐻 gpt.ini	General Security
	Name Add
	Authenticated Users
	Domain Admins (NTENG\Domain Admins)
	Enterprise Admins (NTENG\Enterprise Ad
	Service Accounts (NTENG\Service Acco
	Permissions: Allow Deny
	Full Control
	Read & Execute
	Ad <u>v</u> anced
	Allow inheritable permissions from parent to propagate to this object
Type: Config	OK Cancel Apply 9 KB

17. Finally, refresh the local machine policy on the cluster nodes by opening a command prompt and typing the following:

C:\> secedit /refreshpolicy machine_policy /enforce

This completes creation of the Cluster Group GPO. Proceed to Chapter 5, Node 1 (Primary Node) Configuation.

5 Node 1 (Primary Node) Configuration

Introduction

This chapter contains the step-by-step procedure for configuration of node 1, the primary node, of the VA 7100/7400 disk array in a dual-path cluster configuration.

Preliminary Operations

The following preliminary operations must be successfully completed before beginning the node 1 configuration procedure.

- 1. Ensure that all requirements detailed in chapters 2 through 4 have been thoroughly reviewed and successfully completed.
- 2. Ensure that configuration of the internal and external arrays has been completed.

Configuration Procedure

To configure node 1 of the cluster, proceed as follows:

- 1. Reboot node 1.
- Configuration screen of the dedicated Ethernet interconnect (crossover or heartbeat) NIC for node 1 is shown below. Enter only the IP address and Subnet mask values. For node 1 TCP/IP values, set IP address to 10.0.0.1 and Subnet mask to 255.0.0.0. Leave all other fields empty.

appropriate IP settings.	icea to ask your network duministid(UFIU)
<u>Obtain an IP address auto</u>	omatically
Use the following IP address	ess:
IP address:	10.0.0.1
S <u>u</u> bnet mask:	255.0.0.0
Default gateway:	
Obtain DNS server addres	ss automatically
Use the following DNS se	erver addresses:
Preferred DNS server:	
Alternate DNS server:	

3. Open the **Run** window as shown below by clicking the desktop **Start** -> **Run**. In the Open text box of the **Run** window, enter **diskmgmt.msc**. Then, click **OK**.

Run	Run	<u>?×</u>
Shut Down	Type the name of a program Internet resource, and Wind	n, folder, document, or dows will open it for you.
🏦 Start 🛛 🖏 🈂 🙆	Open: diskmgmt.msc	•
	ОК	Cancel <u>B</u> rowse

- 4. The Write Signature and Upgrade Disk Wizard welcome window appears. Click Next.
- 5. The Select Disk to Write Signature window appears. Check all the disks, then click Next, as shown below.

Select Disk to Write Signatur Choose the disks on which yo	re ou want towrite a signature)	
Colorado da la colorado		
Select the disks on which you	want towrite a signature:	
Disk 1	want to write a signature:	
Disk 1 Disk 2 Disk 3	want towrite a signature:	
Disk 1 Disk 2 Disk 3	want to <mark>write a signature:)</mark>	

CAUTION It is very important not to upgrade disks because the cluster can only use *basic* disks, not *dynamic* disks.

6. The Select Disks to Upgrade window appears. Uncheck all the disks, then click Next, as shown below.

Write Signature and Upgr	ade Disk Wizard		×
Select Disks to Upgra Choose the disks to b	de (upgraded.)		
Select the disks you w	vant toupgrade:		
Disk 2			
	<u> < B</u> a	ack <u>N</u> ext> Can	cel

- 7. The Completing the Write Signature and Upgrade Disk Wizard window appears. Click Finish.
- 8. The **Disk Manager** window appears, as shown below. Determine those disks that are basic and unpartitioned (or unallocated). These disks are labeled **Unknown** and are black in color. In the **Disk Manager** window example shown below, the basic, unallocated disks are **Disk 3** and **Disk 6**.

CDISK 0 Basic 33.90 GB Online	HP_UTILITY 39 MB FAT Healthy (EISA Configuration) (C:) (33.87 GB NTFS Healthy (System)
Cisk 3 Unknown 49.99 GB Online	49.99 GB Unallocated
Conline	
Cisk 6 Unknown 494 MB Online	494 MB Unallocated
CDRom 0 CDRom (D:) 405 MB Online	W2AFPP_EN (D:) 405 MB CDFS Healthy

9. In the Disk Manager window of step 8, right-click on one of the Unknown disks (Disk 3, in this example), and the Write Signature Disk Manager window appears as shown below.

Contraction Contractico Contra	HP_UTILITY 39 MB FAT Healthy (EISA Configuration	(C:) 33.87 GB NTF5 Healthy (System)
CPDisk 3 Basic 49.99 GB Online	49.99 GB Unallocated	
Cisk 5 Basic Online		
Disk 6 Basic 494 MB Online	494 MB Unallocated	
CDRom 0 CDRom (D:) 405 MB Online	W2AFPP_EN (D:) 405 MB CDFS Healthy	

- 10. Right-click in the space labeled **Unallocated** on **Disk 3**. Select **Create Partition**. Then, click **Next** when the **Create Partition Wizard** window appears.
- 11. In the **Select Partition Type** window that appears as shown below, select **Primary partition** (the default), then click **Next**.

Select Partition Type You can specify what type of partitic	on to create.
Select the type of partition you want	to create:
Primary partition	
© Extended partition	
C Logical drive	
_ Description	ĭ
A primary partition is a volume you Windows 2000 and other operati You can create up to four primary three primary partitions and an ex	u create using free space on a basic disk. ng systems can start from a primary partition. y partitions on a basic disk, or you can make tended partition.
	< <u>B</u> ack <u>N</u> ext > Cancel

12. In the **Specify Partition Size** window that appears as shown below, enter the desired partition size in the **Amount of disk space to use:** text box (1024, minimum), then click **Next**.

Choose a partition size that is smaller	r than the maximum disk space.
Maximum disk space:	17344 MB
Minimum disk space:	7 MB
Amount of disk space to use:	17344 HB

13. In the Assign Drive Letter or Path window that appears as shown below, select Assign a drive letter: (the default) and D: from the associated pull-down menu. Then, click Next.

NOTE	If D : is assigned to another drive or partition, the other drive or partition must be assigned an
	alternate.

You can assign a drive I	ath etter or drive path to	a partition.	All A
 Assign a drive letter; Mount this volume a 	D: 💌	supports drive paths: Browse	
1			
C De net ession a dim	Letter or drive eath		

- 14. In the **Format Partition** window that appears as shown below, select **Format this partition with the following settings:** (the default). Ensure that the following settings are entered in the Formatting frame, then click **Next**.
 - File system to use: NTFS
 - Allocation unit size: Default
 - o Volume label: Content
 - Perform a Quick Format is checked.

Specif	y whether you want to forr	nat this partition.		
C	Do not format this partition	1		
œ	Format this partition with t	he following settings:		
	Formatting <u>File system to use:</u> <u>Allocation unit size:</u> <u>V</u> olume label: <u>Perform a Quick Fo</u>	NTFS Default Content rmat Canable	File and folder compression	ession

15. In the **Completing the Create Partition Wizard** window that appears as shown below, review the entered selections to verify accuracy. If required, click **Back** and make corrections as necessary. Then, click **Finish** to create and format the Content partition.

NOTE The formatting time will vary with the Content partition size being created.

Create Partition Wizard		×
	Completing the Create Partition Wizard You have successfully completed the Create Partition Wizard. You specified the following settings: Partition type: Primary Partition Disks Selected: Disk 1 Partition size: 17344 MB Drive letter or path: D: File System: NTFS Allocation Unit Size: Default Volume Labet: Content To close this wizard, click Finish.	
	< <u>B</u> ack Finish Cancel	

- **NOTE** The following step is necessary for configuration of the dedicated Ethernet interconnect (private) network (refer to step 2 of this procedure). Refer to Microsoft Knowledge Base article Q242430 for more information.
- 16. At this time, turn on node 2 power and strike the **Pause** key on the keyboard when the controller begins initiating. Leave node 2 in the **Pause** state.
- **NOTE** Do not perform any further node 2 operations until specifically instructed in chapter 7 because both nodes cannot simultaneously access the external storage array before cluster service has been installed, configured, and is up and running.
- 17. Continue with node 1 configuration by proceeding to Chapter 6, Cluster Setup.

6 Cluster Setup

Introduction

This chapter provides detailed instructions for performing the cluster setup.

Preliminary Operations

The following preliminary operations must be successfully completed before beginning the Cluster Setup Procedure.

- 1. Ensure that all requirements detailed in chapters 2 through 5 have been thoroughly reviewed and successfully completed.
- 2. Ensure that storage array is powered up and maintained in accordance with the procedure of chapter 3.
- 3. Ensure that node 1 is powered up and running.
- 4. Ensure that node 2 is powered up but in **Pause** mode. Refer to step 16 of the Configuration Procedure of chapter 5.
- 5. Ensure that the cluster Configuration Worksheet located in Appendix A has been completely filled out.
- 6. On the node 1 Windows 2000 Configure Your Server window shown below, click Finish setup.



Cluster Setup Procedure

To perform the cluster setup procedure, proceed as follows:

1. In the Add/Remove Programs window shown below, click button labeled Configure to configure cluster service.

🙀 Add/Remov	ve Programs	
Change or Remove Programs	Add or remove Windows components To add or remove a Windows component, such as Internet Information Services (IIS), click Components. Set up services:	Components
Add New Programs Add/Remove Windows Components	Circk Configure Cluster service Click Configure to complete Setup for this component. It cannot run until you have supplied all the necessary information.	Configure
		Close

- 2. The Cluster Service Configuration Wizard Welcome window appears. Click Next.
- 3. In the Hardware Configuration window shown below, click I Understand to activate the Next button. Then, click Next.

Hardware Configuration				
Your hardware configuration	n must be tested for co	ompatability with t	ne Cluster service.	
Microsoft does not support I category of the Hardware C	nardware configuration ompatibility List (HCL)	ns other than thos located at	e listed in the Clu	ster
http://www.microsoft.com/	hwtest/hcl			
To indicate that you unders that are not listed in the Clus	tand that Microsoft do ster category of the HI	es not support ha CL, click I Unders	rdware configurati tand.	ions
			[<u>TU</u> ndersta	nd

4. In the Create or Join a Cluster window shown below, select The first node in the cluster, then click Next.

C.	asta ar Jain a Chutar	
CI	You can create a new cluster, or you can join an existing one.	
	······	
	This server is:	
	 The first node in the cluster. If this server is the first node in a cluster, you are creating a new cluster. 	
0.5	C The second or next node in the cluster. If at least one other node already exists, you are joining an existing cluster.	
	C The second or next node in the cluster. If at least one other node already exists, you are joining an existing cluster.	

5. In the Cluster Name window shown below, type the cluster name CLUS2, then click Next.

Cluster Name			
You must name the new cluster.			
Lype a name for the new cluster:	<u>ر</u>		
CLUSZ			
	i	<u> </u>	<u> </u>

6. In the Select an Account window shown below, enter cluster in the User name: field and the applicable password in the Password: field for the specified domain. Then, click Next.

elect an Acco	unt
For security p	urposes, the Cluster service must use a domain account.
Tupe the user	name and password for the domain account you want the Christer service
to use. This a	ccount is given special security privileges on each cluster node.
	Fluter
User name:	Cluster
Password:	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
<u>P</u> assword: <u>D</u> omain:	NCSWH

7. In the Add or Remove Managed Disks window shown below, select the disk array to be used for this cluster. Select disks in the Unmanaged disks: field, and click Add to transfer them to the Managed disks: field. After all the desired disks have been added to the Managed disks: field, click Next.

Jnmanaged disks: Add -> Add -> C- Remove Managed disks: Managed disks: Disk 1 (HP A6189A EX22) Disk 2 (HP A6189A EX22) C- Disk 2 (HP A6189A EX22) C- Disk 2 (Uorum)	Add the disks that you want the want the cluster to manage	cluster to manage. Remove those disks that you do not
Add -> Disk 1 (HP A6189A EX22) <- Remove F: (DATA) ⊡- Disk 2 (HP A6189A EX22) □- Disk 2 (HP A6189A EX22) □- Q: (Quorum)	Jnmanaged disks:	Managed disks:
		Add ->

8. In the Cluster File Storage window shown below, select disk Q: (Quorum) as the disk to store cluster files. Then, click Next.

Cluster File Storage	
You store cluster checkpoi cluster	int and log files on a cluster disk. These files help manage the
Select a disk on which to s	store cluster checkpoint and log files.
Select a disk or partition wi also recommended that you partition from user applicati	vith at least 5 MB of free space (100 MB recommended). It is bu keep the cluster checkpoint and log files on a separate ions.
Disks:	
Q: (Quorum)	
Disks: Q: (Quorum) D: (Content)	<u> </u>
Disks: Q: (Quorum) D: (Content) L: (Log) Q: (Ouorum)	

9. In the Configure Cluster Network dialog box shown below, click Next.

Cluster Service Configuration Wizard	×
Configure Cluster Networks	
It is recommended that you use more than one private network for cluster communications. Using only one network creates a single point of failure.	
Cluster service can use private networks for cluster status signals and cluster management. This provides more security than using a public network.	
If you prefer, you can use a public network for cluster management, or you can use a mixed network for both private and public communications.	
Make sure you don't select a public network for private communications or a private network for public communications. Either selection prevents other computers from joining the cluster.	
To continue setting up your cluster, click Next.	
< <u>B</u> ack	ncel

10. In the Network Connections window for the public access NIC shown below, verify that the Network name (Local Area Connection, in this case) is correct, check the Enable this network for cluster use box, and click the All communications (mixed network) button. Then, click Next.

Network name:	Local Area Connection
Device:	HP NetServer 10/100TX PCI LAN Adapter
IP address:	15.18.116.181
This network pe C Client acces	etwork for cluster use rforms the following role in the cluster: s only (public network) ter communications only (private network)

11. In the **Network Connections** window for the dedicated Ethernet internal connection shown below, verify that the **Network name (private network, in this case) is correct, check the Enable this network for cluster use** box, and click the **Internal cluster communications only (private network)** button. Then, click **Next**.

k

12. In the **Internal Cluster Communication** window shown below, ensure that **Private** (internal cluster communication NIC) is positioned above the **Local Area Connection 2** (public access) in the Networks field. If adjustment of the order is required, select one entry, then click **Up** or **Down** button, as required. Then, click **Next**.

Specify the within the c	priority in which the a uster.	available network	s should be use	d for communical	ion
The followii (private net networks in To move a Networks:	ig list displays the ne works). Position the p descending order of name in the list, selec	etworks available primary network fi f importance. ct the name, and	for internal clust rst, and then po then click Up o	er communicatior sition additional : Down.	1
Private Local Area	Connection 2			<u>U</u> p Dowr	

13. In the Cluster IP Address window shown below, enter 15.18.116.215 in the IP address field, and repeat verification of the public access NIC as performed in step 10. Then, click Next.

Cluster IP Address The IP address ide	entifies the cluster to the network.		
Type the IP addre automatically.	ss for management of the cluster. 1	The subnet mask may be su	pplied
IP address:	15 . 18 . 116 . 215		
Subnet mask:	255 . 255 . 248 . 0		
Select the public r	etwork from which clients gain ac	cess to the cluster.	
Network:	Local Area Connection		-
		1	

14. In the **Completing the Cluster Service Configuration Wizard** window shown below, click **Finish** to complete the cluster node 1 configuration.

Cluster Service Configura	tion Wizard	×
	Completing the Cluster Service Configuration Wizard	
	You have successfully completed the Cluster Service Configuration wizard.	
	To complete the configuration, click Finish.	
	< <u>B</u> ack Finish Cano	;el

15. The message shown below appears to indicate that cluster service has started.



16. Open the Cluster Administrator window as shown below by clicking the desktop Start -> Programs -> Administrative Tools -> Cluster Administrator. Verify that cluster node 1 has started and is running correctly.



17. With node 1 up and running, configuration of node 2 can be performed. Proceed to chapter 7.

7 Node 2 (Secondary/Passive Node) Configuration

Introduction

This chapter contains the step-by-step procedure for configuration of node 2, the secondary/passive node, of the VA 7100/7400 disk array in a dual-path cluster configuration.

Preliminary Operations

The following preliminary operations must be successfully completed before beginning the cluster setup procedure.

- 1. Ensure that all requirements detailed in chapters 2 through 6 have been thoroughly reviewed and successfully completed.
- 2. Ensure that storage array is powered up and maintained in accordance with the procedure of chapter 5.
- 3. Ensure that node 1 is powered up and running.
- 4. Remove node 2 from the Pause state, and allow node 2 to finish its booting.

Configuration Procedure

Perform the following procedure to configure node 2, the secondary or passive node.

- 1. Repeat the setup process of node 1 to set up node 2; that is, repeat the procedure of chapter 5. Check for detection of any dynamic drives and change them to basic as performed in steps 4 through 7 of chapter 5. This time, there is no need to pause any server, as was done with node 2 at the end of chapter 5. Ensure that the drive letters are identical on both nodes (refer to step 13 of chapter 5).
- 2. Repeat the procedures of chapter 6 for node 2 up through step 3 of the Cluster Setup Procedure.
- 3. In the Create or Join a Cluster window shown below, select The second or next node in the cluster, then click Next.

Create or Join a Cluster		
You can create a new cluster, or	r you can join an existing one.	
This server is:		
C The first node in the cluster. If this server is the first node i	in a cluster, you are creating a new cluster.	
The second or next node in t If at least one other node already	the cluster. eady exists, you are joining an existing cluster.	

4. In the **Cluster Name** window shown below, type **CLUS2** in the cluster name field. Then, enter **cluster** in the **User name**: field and the applicable password in the **Password**: field for the specified domain. Check the entry in the **Domain**: field. All entries on the window shown below must be identical to the entries in steps 5 and 6 of the Cluster Setup Procedure of chapter 6. Then, click **Next**.

luster Name Tojoin a clusti	er, you must provide the cluster name.	
Type the name	e of the cluster you want to join:	
CLUS2		
Connect to	o cluster as:	
User name:	cluster	
	provide the second s	
Password:	******	
<u>P</u> assword: <u>D</u> omain:	NCSWH	

5. In the **Select an Account** window shown below, enter the applicable password in the **Password:** field again. Then, click **Next.**

Freed an Accu	ount	
For security p	urposes, the cluster service must use a domain accoun	L.:
Type the user	r name and password for the domain account you want	the Cluster service
to use. This a	ccount is given special security privileges on each clust	er node.
User name:	cluster	
User name: Password:		<u> </u>
User name: Password: Domain:	Cluster NCSWH	

6. In the **Completing the Cluster Service Configuration Wizard** window shown below, click **Finish** to complete the cluster node 2 configuration.

Cluster Service Configura	ation Wizard	×
	Completing the Cluster Service Configuration Wizard	
	You have successfully completed the Cluster Service Configuration wizard.	
	To complete the configuration, click Finish.	
	< <u>B</u> ack Finish Can	cel

 Open the Cluster Administrator window as shown below by clicking the desktop Start -> Programs ->
 Administrative Tools -> Cluster Administrator. Verify that both cluster nodes 1 and 2 have started and are
 running correctly. At this point, cluster setup and installation are complete and ready for installation of a cluster
 resource application such as Microsoft SQL Server 2000 Enterprise Edition.

Cluster Administrator - [CLU52	(.)]					
E-S CLUS2	Name	State	Owner	Group	Resource Type	Descriptio
Croups Configuration Cluster Configuration Cluster Configuration Cluster Configuration Cluster Configuration Cluster Configuration Cluster Configuration Active Resources Cluster Configuration Active Resources Cluster Configuration Active Resources Network Interfaces	LD Disk D: D Disk L: @D Uniter IP Address @D Uniter Name D Disk Q:	Online Online Pending Online Pending Online Online	CUUSAN2 CUUSAN2 CUUSAN2 CUUSAN2 CUUSAN2 CUUSAN2	Disk Group 2 Disk Group 1 Cluster Group Cluster Group Cluster Group	Physical Disk Physical Disk IP Address Network Name Physical Disk	<u>•</u>
For Help, press F1						1

A Configuration Worksheet

Manual Configuration Worksheet

This sheet should be filled out completely before beginning the provisioning process. Specific documents referencing appropriate servers, DNS entries, etc. should be available for each data center. If your data center does not have one, generate one from this base and make it available to all administrators.

		Node 1		Node 2	
1	Organizational Unit (OU)			1	
2	Computer Name				
3	Cluster Name				
4	Cluster Account / (Password)				
5	Cluster IP Address				
6	Cluster Subnet Mask				
7	Windows 2000 Domain Name				
Items 8 - 14 Refer to the Front-End (Public) Network Adapter					
8	Front-End IP Address				
9	Front-End Subnet Mask				
10	Front-End Default Gateway				
11	Front-End Primary DNS				
12	Front-End Secondary DNS				
13	Front-End Duplex Mode	Half	Full	Half	Full
14	Front-End Media Type	10	100 (Mbps)	10	100 (Mbps)
Item	s 15 – 16 Refer to the Crossover (Priva	te) Netwo	rk Adapter		
15	Private IP Address	10.0.0.1		10.0.0.2	
16	Private Subnet Mask	255.0.0.0)	255.0.0.0	
Item	s 17 - 20 Refer to the Back-End Networ	k Adapte	r		
17	Back-End IP Address				
18	Back-End Subnet Mask				
19	Back-End Duplex Mode	Half	Full	Half	Full
20	Back-End Media Type	10	100 (Mbps)	10	100 (Mbps)

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