

quick start
guide

hp StorageWorks NAS e7000 v2

First Edition (March 2003)

Part Number: 326195-001

This Quick Start guide provides information about how to deploy the HP StorageWorks NAS e7000 v2 as a single device or as a clustered node attached to a storage area network (SAN).



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NAS e7000 v2 Quick Start Guide
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contents

| | |
|--|-----------|
| About this Guide | 7 |
| Overview | 8 |
| Intended Audience | 8 |
| Prerequisites | 8 |
| Related Documentation | 8 |
| Conventions | 9 |
| Document Conventions | 9 |
| Text Symbols | 9 |
| Equipment Symbols | 10 |
| Rack Stability | 11 |
| Getting Help | 12 |
| HP Technical Support | 12 |
| HP Storage Website | 12 |
| HP Authorized Reseller | 12 |
| 1 Product Overview | 13 |
| Intended Audience | 14 |
| Product Definition and Information | 14 |
| Server Hardware Features | 14 |
| Optional Features | 14 |
| Server Software Features | 15 |
| Configuration Options | 16 |
| NAS e7000 v2 as a Single Device Attached to a SAN | 16 |
| NAS e7000 v2 as a Clustered Pair Attached to a SAN | 17 |
| Connecting NAS e7000 v2 to the Network | 19 |
| NAS e7000 v2 Single Device Deployment | 19 |
| NAS e7000 v2 Cluster Deployment | 20 |
| Setup and Configuration Overview | 22 |
| Standalone NAS e7000 v2 | 22 |
| Clustered NAS e7000 v2 | 23 |

| | |
|--|-----------|
| Storage Management Overview | 26 |
| Storage Management Elements | 26 |
| Storage Elements | 28 |
| Logical Storage Elements | 28 |
| Single Server Implementations | 28 |
| Clustered Server Implementations. | 28 |
| File System Elements. | 28 |
| Persistent Storage Management Elements | 29 |
| Snapshot Facts | 29 |
| File-Sharing Elements | 30 |
| Clustered Server Elements | 30 |
| 2 Before You Begin | 31 |
| Preinitialization. | 31 |
| Collect Information for Configuration | 32 |
| Configuration Information | 32 |
| Default Username and Passwords | 34 |
| 3 Configuration Setup | 35 |
| Configuration Method | 36 |
| WebUI Configuration | 36 |
| Auto Discovery Method (Via RapidLaunch). | 36 |
| Requirements. | 36 |
| Procedure. | 37 |
| Direct Access Method (Via Hostname) | 43 |
| Requirements | 43 |
| Procedure | 43 |
| Completing the System Configuration | 45 |
| 4 Beyond Initial Setup | 47 |
| Connecting to the SAN. | 48 |
| SAN Connection Tool | 48 |
| Modular SAN Array 1000 Requirements | 48 |
| Modular Array Requirements | 49 |
| Virtual Array Requirements | 49 |
| Disk Array XP Requirements | 49 |
| Enterprise Virutal Array Requirements. | 49 |
| Introduction To Establishing a NAS Cluster | 50 |
| HP StorageWorks NAS Software Updates | 50 |

| | |
|---|------------|
| Checklists for Cluster Server Installation | 51 |
| Network Requirements | 51 |
| Shared Disk Requirements | 51 |
| Cluster Installation | 52 |
| Installation Overview | 52 |
| Configure the Private Network Adapter | 53 |
| Configure the Public Network Adapter | 53 |
| Rename the Local Area Network Icons | 54 |
| Verifying Connectivity and Name Resolution | 54 |
| Verifying Domain Membership | 54 |
| Setting Up a Cluster User Account | 54 |
| About the Quorum Disk | 54 |
| Configuring Shared Disks | 55 |
| Verifying Disk Access and Functionality | 55 |
| Install Cluster Service Software | 55 |
| Configuring the First Node | 55 |
| Configuring Cluster Disks | 58 |
| Validating the Cluster Installation | 63 |
| Configuring the Second Node | 64 |
| Verifying Installation | 64 |
| HP StorageWorks NAS Software Updates | 66 |
| Configuring Physical Disk Resources after the Cluster Install is Complete | 66 |
| Index | .67 |



about this guide

This quick start guide provides information to help you deploy the HP StorageWorks NAS e7000 v2.

“About this Guide” topics include:

- [Overview](#), page 8
- [Conventions](#), page 9
- [Rack Stability](#), page 11
- [Getting Help](#), page 12

Overview

This section covers the following topics:

- [Intended Audience](#)
- [Prerequisites](#)
- [Related Documentation](#)

Intended Audience

This book is intended for use by **administrators** who are experienced with the following:

- server, cluster, and network installations
- SAN administration

This guide assumes that the reader has knowledge of basic Microsoft® cluster concepts, Microsoft administrative procedures, and file-sharing protocols. It is recommended that the reader obtain supplemental documentation relative to these topics prior to setting up the NAS e7000 v2.

Prerequisites

Before you set up the NAS e7000 v2, HP recommends that the reader obtain supplemental documentation relative to the items listed in the section titled “Intended Audience.”

Related Documentation

In addition to this guide, HP provides corresponding information:

- *HP StorageWorks NAS e7000 v2 Administration Guide*
- *HP StorageWorks NAS e7000 v2 Quick Reference and Rack Installation* poster
- *HP StorageWorks NAS e7000 v2 Release Notes*

Conventions

Conventions consist of the following:

- [Document Conventions](#)
- [Text Symbols](#)
- [Equipment Symbols](#)

Document Conventions

The document conventions included in [Table 1](#) apply in most cases.

Table 1: Document Conventions

| Element | Convention |
|---|---|
| Cross-reference links | Figure 1 |
| Key and field names, menu items, buttons, and dialog box titles | Bold |
| File names, application names, and text emphasis | <i>Italics</i> |
| User input, command and directory names, and system responses (output and messages) | Monospace font COMMAND NAMES are uppercase monospace font unless they are case sensitive |
| Variables | <monospace, italic font> |
| Website addresses | Underlined sans serif font text: http://www.hp.com |

Text Symbols

The following symbols may be found in the text of this guide. They have the following meanings.



WARNING: Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or death.



Caution: Text set off in this manner indicates that failure to follow directions could result in damage to equipment or data.

Note: Text set off in this manner presents commentary, sidelights, or interesting points of information.

Equipment Symbols

The following equipment symbols may be found on hardware for which this guide pertains. They have the following meanings.



Any enclosed surface or area of the equipment marked with these symbols indicates the presence of electrical shock hazards. Enclosed area contains no operator serviceable parts.

WARNING: To reduce the risk of personal safety from electrical shock hazards, do not open this enclosure.



Any RJ-45 receptacle marked with these symbols indicates a network interface connection.

WARNING: To reduce the risk of electrical shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.



Any surface or area of the equipment marked with these symbols indicates the presence of a hot surface or hot component. Contact with this surface could result in injury.

WARNING: To reduce the risk of personal safety from a hot component, allow the surface to cool before touching.



Power supplies or systems marked with these symbols indicate the presence of multiple sources of power.

WARNING: To reduce the risk of personal safety from electrical shock, remove all power cords to completely disconnect power from the power supplies and systems.



Any product or assembly marked with these symbols indicates that the component exceeds the recommended weight for one individual to handle safely.

WARNING: To reduce the risk of personal safety or damage to the equipment, observe local occupational health and safety requirements and guidelines for manually handling material.

Rack Stability

Rack stability protects personnel and equipment.



WARNING: To reduce the risk of personal safety or damage to the equipment, be sure that:

- The leveling jacks are extended to the floor.
 - The full weight of the rack rests on the leveling jacks.
 - In single rack installations, the stabilizing feet are attached to the rack.
 - In multiple rack installations, the racks are coupled.
 - Only one rack component is extended at any time. A rack may become unstable if more than one rack component is extended for any reason.
-

Getting Help

If you still have a question after reading this guide, contact an HP authorized service provider or access our website: <http://www.hp.com>.

HP Technical Support

Telephone numbers for worldwide technical support are listed on the following HP website: <http://www.hp.com>. From this website, select the country of origin.

Note: For continuous quality improvement, calls may be recorded or monitored.

Be sure to have the following information available before calling:

- Technical support registration number (if applicable)
- Product serial numbers
- Product model names and numbers
- Applicable error messages
- Operating system type and revision level
- Detailed, specific questions

HP Storage Website

The HP website has the latest information on this product, as well as the latest drivers. Access storage at: <http://www.hp.com>. From this website, select the appropriate product or solution.

HP Authorized Reseller

For the name of your nearest HP authorized reseller:

- In the United States, call 1-800-345-1518
- In Canada, call 1-800-263-5868
- Elsewhere, see the HP website for locations and telephone numbers: <http://www.hp.com>.

Product Overview



This chapter describes the configuration options and setup and configuration dependencies and requirements for the HP StorageWorks NAS e7000 v2. The chapter also contains details concerning hardware configuration specifications.

Intended Audience

This guide assumes that the reader has knowledge of basic Microsoft® cluster concepts, Microsoft administrative procedures, and file-sharing protocols. It is recommended that the reader obtain supplemental documentation relative to these topics prior to setting up the NAS e7000 v2.

Product Definition and Information

The NAS e7000 v2 is an enterprise class NAS/SAN solution that provides reliable performance, manageability, and fault tolerance.

Server Hardware Features

The following features are included in the NAS e7000 v2:

- Two Intel Pentium Xeon 2.0 GHz processors, with 2MB cache
- 4GB, 200 MHz PC1600 DDR SDRAM memory
- 64-bit PCI-X I/O technology (four hot-pluggable 100MHz slots, two non-hotplug 100MHz slots)
- Two 36.4-GB 10K U320 Universal hot-pluggable hard drives for the mirrored, pre-loaded NAS operating system.
- One integrated NC7770 10/100/1000 WOL (Wake on LAN) network interface controller (NIC)
- One NC3134 network interface controller
- Embedded Smart Array 5i Plus controller
- IDE DVD-ROM drive
- Redundant hot-plug power supplies and fans
- Embedded Integrated Lights-Out (iLO) port with license key included in the country kit

Optional Features

- Additional memory of up to 32-GB.
- HP NICs
- Alacritech NICs
- HP tape drives

- 18.2-GB, 36.4-GB, 72.8-GB, and 146.8-GB U320 Hot Plug hard drives
- HP SAN Fibre Channel Adapters for tape backup
- HP StorageWorks FCA2101 2G FC HBA (LP952)
- HP Disk Array XP, Virtual Array, Modular SAN Array 1000 (MSA1000), Modular Array, and Enterprise Virtual Array Support

Server Software Features

Advanced features included with and supported by the NAS e7000 v2 include:

- Microsoft Windows Powered OS with Service Pack 3
- Microsoft Clustering Support – requires two e7000 v2s attached to the same SAN Fiber fabric.
- HP Secure Path 4.0 (licensing included)
- HP AutoPath (installed, but licensing is required from HP)
- HP StorageWorks Platform Kits
- HP Insight Manager 7
- Microsoft Services for Macintosh
- Microsoft Services for NetWare
- Microsoft Services for UNIX (SFU)
- HP StorageWorks NAS Web Based User Interface (WebUI)
- HP StorageWorks NAS Data Copy (Trial Version)
- Columbia Data Products - Persistent Storage Manager
- Optional third party supported software (not included):
 - Management software
 - Quota management
 - Virus protection
 - Backup software

Configuration Options

The NAS e7000 v2 can be deployed in two different configurations attached to a storage area network (SAN): as a single NAS device or as a clustered pair. By default, the NAS e7000 v2 does not ship with a standard HBA to allow for maximum flexibility in the SAN environment. For a list of supported HBAs for the NAS e7000 v2, see the quick specs for the product.

NAS e7000 v2 as a Single Device Attached to a SAN

In the single NAS device configuration, a NAS e7000 v2 is attached to a SAN via a single or pair of fiber channel host bus adapters (HBAs) and one or more SAN switches. In [Figure 1](#), the dual HBA approach is illustrated. Each HBA should be connected to a separate switch that has access to the same controller pairs. This connection method allows redundant paths to the same storage subsystem.

SAN storage is not managed by the NAS e7000 v2 and requires coordination between the NAS administrator and the SAN administrator. LUN requests need to be made and assigned to the NAS e7000 v2 using selective storage presentation from the SAN controller pairs. Naming of the LUNs and the connections to the NAS e7000 v2 is important for tracking and identification purposes. At least one LUN is required for use by the NAS e7000 v2 in order for the device to be functional.

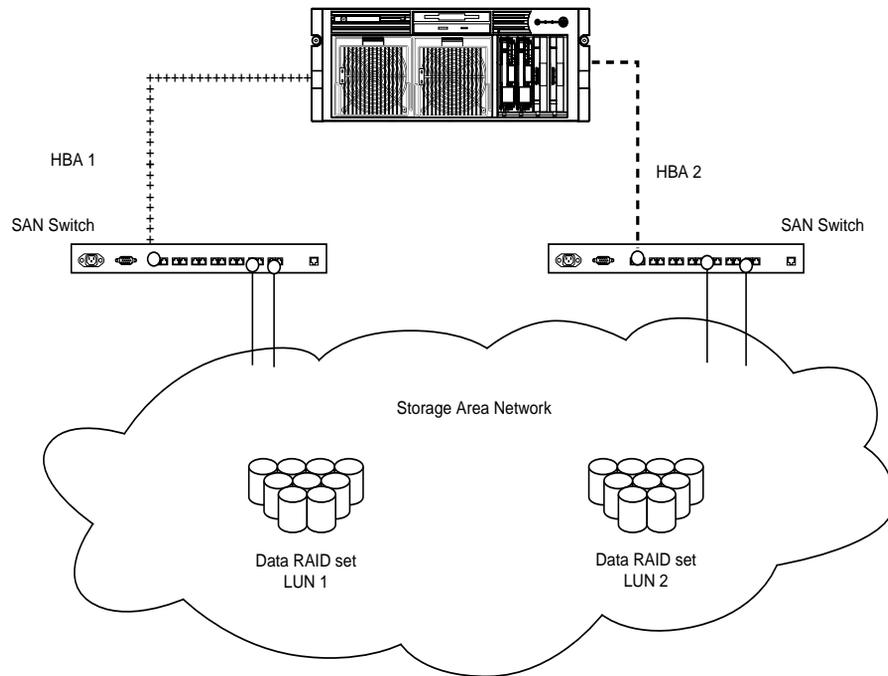


Figure 1: NAS e7000 v2 as a single device

NAS e7000 v2 as a Clustered Pair Attached to a SAN

In the clustered configuration, two NAS devices are linked via a private network and have access to shared storage as illustrated in [Figure 2](#). In clustered deployments, it is recommended that each NAS device be attached to the SAN via a pair of fiber channel HBAs. Dual HBAs per NAS device is recommended but not required for cluster deployments, since dual HBAs allow for path failure without causing node failover in the cluster.

For the NAS e7000 v2, cluster setup requires at least three LUNs. One LUN is required for the quorum disk and two LUNs are required for data disks. Individual data disks specific to each node are required for the proper setup of file sharing where both nodes participate in file-sharing activities. Clustered NAS systems have the ability to provide redundant active/active access to file shares on disk. However, as with all Microsoft-based clusters, the unit of ownership among nodes is at the disk level. Therefore, individual fileshares can be accessed by only one node at a time based on which node owns the disk.

As mentioned previously the storage associated with the NAS device is not managed by the NAS e7000 v2 directly. In the case of clustered NAS e7000 v2 deployments, it is important that the LUNs in use by the cluster follow the guidelines pointed out later in this chapter in the [“Storage Management Elements”](#) section.

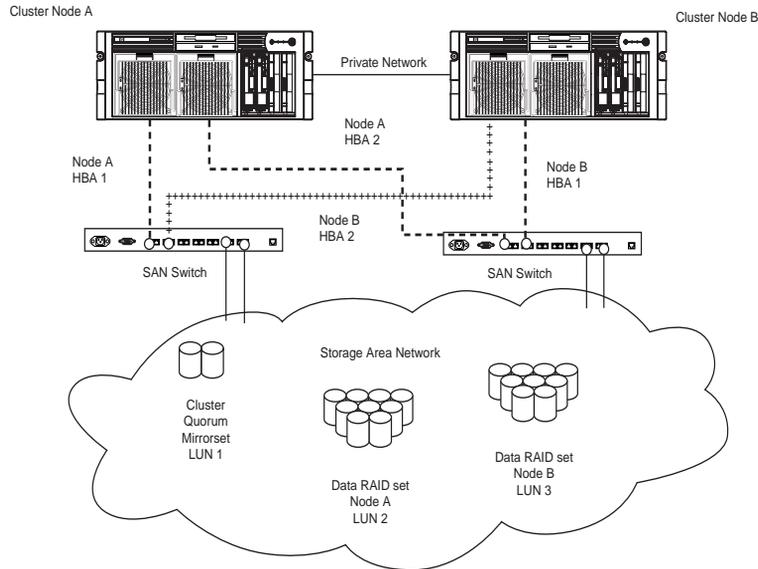


Figure 2: NAS e7000 v2 as a clustered pair of devices

Connecting NAS e7000 v2 to the Network

The NAS e7000 v2 can be connected to the network as a single device or as a clustered pair.

NAS e7000 v2 Single Device Deployment

In a single device deployment, network connections are divided into two categories: client data segments and management segments. The default shipping configuration contains a two-port network interface controller (NIC) 10/100 and a single 10/100/1000 NC7770 NIC that together provide one port for management and two ports for client data. The management port is intended for use with the 3201 port of the device to enable use of the Web User Interface (WebUI) that accompanies the product. It is from this WebUI that most management and administrative procedures can be accomplished. An additional management port for remote console and diagnostics is provided off the Integrated Lights-Out (iLO) port. HP recommends that this connection be placed on a management LAN separate from the corporate infrastructure.

The NAS e7000 v2 supports the use of NIC teaming. NIC teaming provides failover and load balancing of network ports of the NAS e7000 v2. NIC teaming requires the network cables to be installed on the same subnet to enable it to work. For example in [Figure 3](#), Eth1 and Eth2 would need to be on the same subnet to enable this functionality on those ports. However, it is not recommended to assign IP addresses to the ports that will be teamed or load balanced prior to the installation and setup of NIC teaming. For this reason, HP recommends that you set all network ports to DHCP with the exception of Eth0, which is used for management and only needs to meet the configuration policies of the corporation. For information concerning the configuration of NIC teaming after setup is complete, see the administration guide.

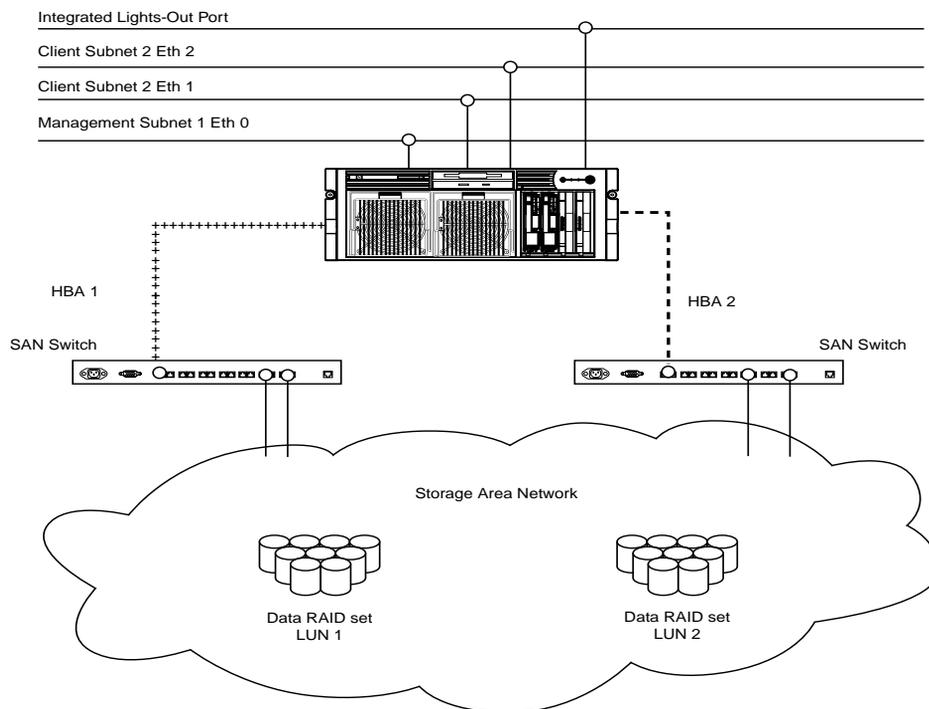


Figure 3: NAS e7000 v2 single device deployment

NAS e7000 v2 Cluster Deployment

In a clustered deployment, network connections are divided into three categories: cluster maintenance segments, client data segments, and management segments. The default shipping configuration contains a two-port NC3134 10/100 network interface controller (NIC) and a single NC7770 10/100/1000 NIC that together provide one port for management, one port for cluster maintenance, and one port for client data, respectively. An additional management port for remote console and diagnostics is provided off of the iLO port. HP recommends that this connection be placed on a management LAN separate from the corporate infrastructure.

The cluster maintenance segment is also known as the heartbeat connection between the nodes. In standard configurations, this connectivity is obtained by the use of a crossover network cable. The same effect can be achieved by placing the heartbeat ports on its own switch or VLAN, as illustrated in [Figure 4](#) as Eth1. The purpose is to isolate and guarantee the connectivity between the nodes without

interruption. If interruption occurs, the remaining cluster node will assume the other node has gone down and initiate a failover. A second cluster heartbeat path is often recommended as a redundant path. The redundant path is often done over one of the remaining network segments and is not dedicated.

The client data segments of a cluster must reside on identical network segments for each node. As illustrated in [Figure 4](#), Eth2 from both nodes is shown on the same segment. This co-location on the same segment allows cluster resources such as file shares to failover to the second node and continues to provide availability to the resources. The failed resource will have the same IP address after the failover and therefore must have a port corresponding to the identified subnet of the IP address present on both nodes.

The NAS e7000 v2 supports the use of NIC teaming in clustered configurations. All previous caveats from the NAS e7000 v2 single node deployment on networks section still apply.

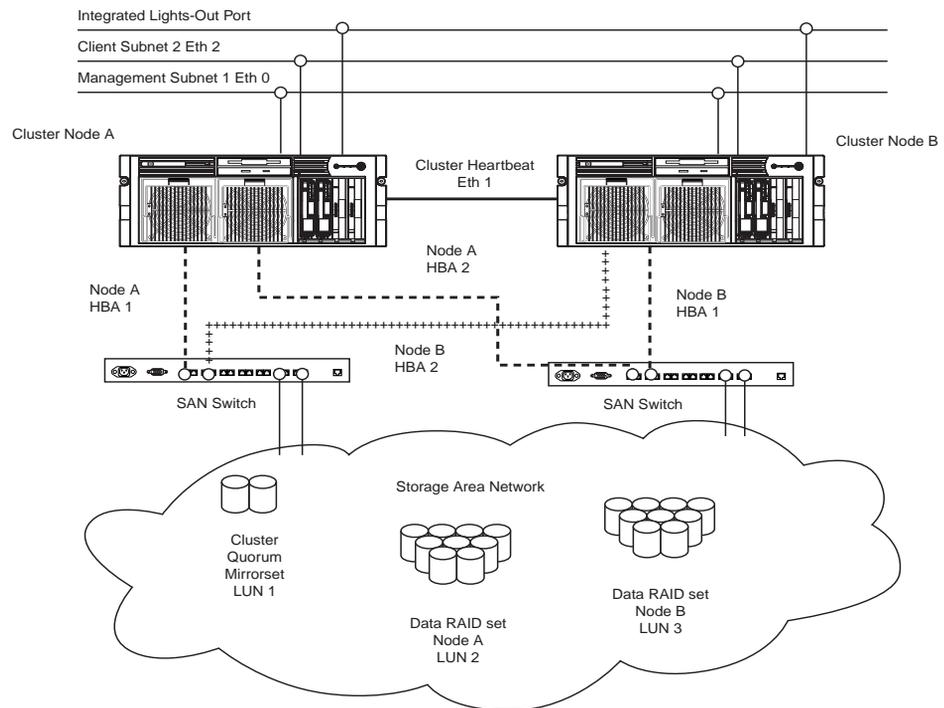


Figure 4: NAS e7000 v2 cluster deployment

Setup and Configuration Overview

In setting up clustered and non-clustered systems, there is a well-defined process. This section is intended as an overview of the process, and not a detailed list of step-by-step instructions. Step-by-step procedures are documented in the administration guide. Some of the steps are driven by the WebUI. In either type of setup, it is important to read all of the supplied documentation prior to starting. Relevant documents include:

- Administration Guide
- Online Cluster Install Guide in the Cluster Tab of the WebUI (Cluster Installs)
- Online Storage Guide in the Cluster Tab of the WebUI (Cluster Installs)
- Online SAN Connection Tool in the HP Utilities tab of the WebUI
- Quick Reference Poster
- Connection Poster

Standalone NAS e7000 v2

The following describes how to configure the NAS e7000 v2 as a single device.

1. Request Storage from the SAN administrator referencing the suggestions made in this guide and the storage management section of the administration guide. The LUNs will need to exist on the SAN prior to completing setup.
2. Initialize the NAS device using Chapters 2 and 3 from this guide.
3. Identify the firmware, storage network topology (hub vs. switch), and storage controller features in use on the SAN. Prior to connecting any fiber cables, utilize the SAN Connection tool included in the HP Utilities Tab of the WebUI to configure the HBA and corresponding pathing software. Additional information about the SAN connection tool may be found in Chapter 4 of this guide
4. **This is an optional step.** Install NIC teaming software and create fault tolerant or load balanced network ports. Follow the recommendations found in this guide and in the administration guide.
5. Connect the fiber channel cables to the storage switch or hub. The SAN administrator will need to enable the connections one at a time as the cables are connected.

6. Place the NAS device into an active directory or Windows NT 4.0 domain for ease of manageability. This is not required for stand-alone systems, but it is recommended.
7. While the system is online, assign the LUNs to the NAS device one at a time so that they can be identified easily in Device Manager. See the procedure in the storage management section of the administration guide.
8. Using Logical Disk Manager, write signatures to the disks, mark them as basic or dynamic, create corresponding partitions, extended partitions or volumes, assign drive letters, and format the drives. See the LDM online help for full details on this procedure.
9. Create shares and assign share permissions.
10. **This is an optional step.** Enable protocols such as NCP and/or AppleTalk as desired. See the administration guide for this procedure in detail.
11. **This is a recommended step.** Create shares corresponding to the protocols mentioned in the previous steps. Grant access rights to the shares.
12. **This is a recommended step.** Activate the iLO License Key. The iLO License Key is included in the country kit.
13. **This is an optional step.** Install NAS Data Copy for replication services among NAS or server products. A thirty day trial license is included with NAS operating system.
14. Read the remaining sections of the administration guide which detail the steps and processes for utilizing the NAS device.

Clustered NAS e7000 v2

The following describes how to configure the NAS e7000 v2 as a clustered pair.

1. Request storage from the SAN administrator referencing the suggestions made in this guide and the storage management section of the administration guide. The LUNs will need to exist on the SAN prior to completing setup. A mirrored quorum disk and at least two additional logical unit numbers (LUNs) will be required to allow each node of the cluster to manage file system resources.
2. Set up each NAS device in the cluster using either Chapter 2 or 3 from this guide.
3. Identify the firmware, storage network topology (hub vs. switch), and storage controller features in use on the SAN. Prior to connecting any fiber cables, utilize the SAN Connection tool included in the HP Utilities Tab of the

WebUI to configure the HBA and corresponding pathing software. Additional information about the SAN connection tool may be found in Chapter 4 of this guide

4. **This is an optional step.** Install NIC teaming software and create fault tolerant or load balanced network ports. Follow the recommendations found in this guide and in the administration guide.
5. Connect the fiber channel cables to the storage switch or hub. If selective storage presentation (SSP) is being used, the administrator will need to enable the connections one at a time as the cables are connected. See the cluster setup instructions included in Chapter 4 of this guide prior to enabling any of the presented storage.
6. Place the NAS device into an active directory or Windows NT 4.0 domain for ease of manageability. This is required for clustered systems.
7. While the system is online, assign the LUNs to the first NAS device one at a time so that they can be identified easily in Device Manager. See the procedure in the storage management section of the administration guide.

Note: Do not let both nodes access the shared storage devices at the same time until Cluster service is installed on at least one node and that node is online. This can be accomplished through selective storage presentation, SAN switch zoning, or having only one node online at all times.

8. Using Logical Disk Manager (LDM), write signatures to the disks, mark them as basic (dynamic disk are not supported in a cluster), create corresponding partitions, assign drive letters, and format the drives. Mount points are not supported in Microsoft clustering. See the LDM online help for full details on this procedure.
9. Use the cluster installation guide included in the Cluster Tab of the Web to configure the cluster. Cluster installation information is also included in Chapter 4 of this guide and the cluster section of the administration guide. Successful setup is dependent upon the use of the cluster checklist.
10. **This is an optional step.** Enable protocols such as NCP and/or AppleTalk as desired. See the administration guide for this procedure in detail. Certain protocols are available for use in a cluster but are not cluster aware protocols : NCP, AppleTalk and HTTP. See the administration guide for complete details.

11. **This is a recommended step.** Create shares corresponding to the protocols mentioned in the previous steps. Grant access rights to the shares. See the cluster section of the administration guide for this procedure in detail.
12. **This is a recommended step.** Activate the iLO License Key. The iLO License Key is included in the country kit.
13. **This is an optional step.** Install NAS Data Copy for replication services among NAS or server products. A thirty day trial license is included with the NAS operating system.
14. Read the remaining sections of the administration guide which detail the steps and processes for utilizing the NAS device. Special attention should be applied to the cluster management chapter.

Storage Management Overview

This section provides an overview of the components that make up the NAS storage structure. A complete discussion of the components and their relationships is available in the administration guide.



Caution: This section on storage management and Windows LDM is required reading material for the NAS administrator. This section develops the concepts and requirements that serve as the basis for successfully using an HP StorageWorks NAS device. Failure to read this section and the appropriate sections on storage management in the administration guide may lead to data loss or file corruption.

Storage Management Elements

[Figure 5](#) provides an illustration of the various storage components of the NAS e7000 v2. Storage is broken up into six major divisions:

- Storage elements
- Logical storage elements
- Persistent Storage Manager Elements
- File system elements
- File-sharing elements (Single Server Implementations)
- Cluster Server Elements

Each of these elements is composed of the previous level's elements. [Figure 5](#) illustrates an MSA1000 as the storage example. Any storage device supported by the NAS e7000 v2 can be substituted in the diagram. ACU refers to the storage configuration software utilized by the MSA1000.

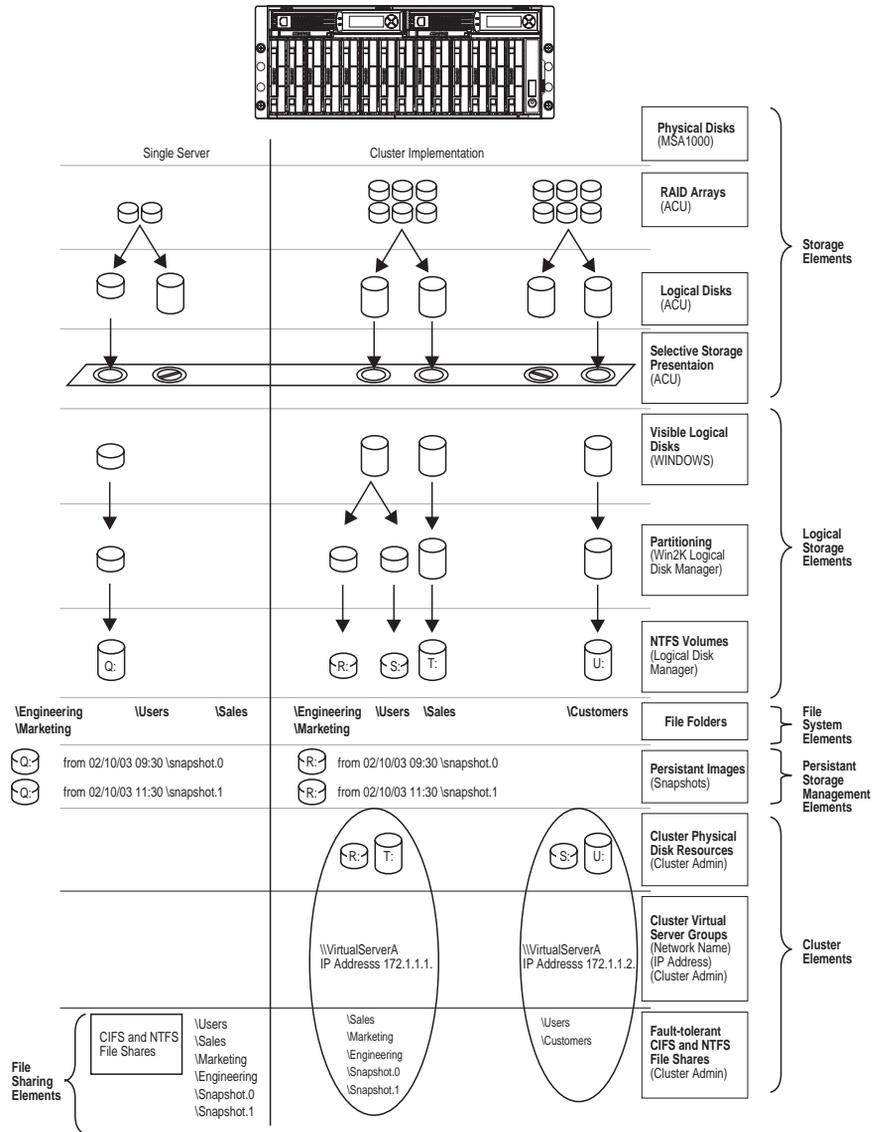


Figure 5: Storage management process

Storage Elements

The lowest level of storage management on the NAS e7000 v2 occurs at the physical drive level. Physical drives are grouped into RAID arrays for fault tolerance and better performance. Configure RAID arrays using the appropriate storage configuration tool for the SAN in use or request that the SAN administrator establish the appropriate LUNs.

Logical Storage Elements

Single Server Implementations

Logical Storage elements consist of those components that translate the physical storage elements to the file system elements as presented in [Figure 5](#). The e7000 v2 utilizes the Microsoft Logical Disk Manager (LDM) for managing the various types of disk presented to the file system. LDM has two types of LUN presentation, basic disk and dynamic disk. Each of these types of disk has special features that enable different types of management. Through the use of basic disks, partitions or extended partitions may be created. Partitions can only encompass one LUN up to 2 TB in size. By using dynamic disks, you can create volumes that span multiple 2 TB LUNs up to 64 TB in total volume size. Volumes or partitions can then be assigned a drive letter or mount point, formatted, and then presented to the operating system for use.

Clustered Server Implementations

Clustered implementations differ from single server implementations in that they can only utilize basic disks. Basic disks are the subcomponent of physical disk resources that can then be used as basic units of failover in a cluster. All basic disks should have an assigned drive letter since mount points are not supported in Microsoft clustering.

File System Elements

File system elements are composed of the folders and subfolders that are created under each logical storage element (partitions, logical disks, and volumes). Folders are used to further subdivide the available file system providing another level of granularity for management of the information space. Each of these folders can contain separate permissions and share names that can be used for network access. Folders can be created for individual users, groups, projects, and so on. Refer to the administration guide for more details on file system elements.

Persistent Storage Management Elements

Persistent Storage Manager lets the administrator make persistent images, also known as snapshots. Snapshots enable the creation of multipurpose logical replicas of production data without having to physically copy the data. They can be used to immediately recover a lost file or directory, to test a new application with realistic data without affecting the “real” data, and to serve as a source of data for backups. Snapshots are a temporary representation of the data and are not meant to be permanent.

Snapshots use existing space from the volume, partition, or logical drive to maintain the data required to present the original data. This space is termed the cache file. By default the cache files consumes 10 percent of the available space of a logical storage element. Snapshots can be read only, read-write or always keep. If snapshots are shared, users can access a snapshot and edit the data. Write-enabled snapshots may be reverted to their original dataset by altering the snapshot type back to read only.

Snapshot Facts

- Snapshots are created on a per volume, volume group, partition, or logical drive basis.
- Snapshots can be read-only, read-write or always keep.
- Snapshots are mounted as a mount point on the root of the volume, partition or logical drive.
- Snapshots can be shared in the same manner as any other folder, drive or mount point.
- Snapshots are meant to be temporary in nature.
- Snapshots are automatically deleted if disk space becomes critical and they are not set to always keep.
- Persistent Storage Manager only writes to the cache file on the first change of the underlying data.

Full documentation of Persistent Storage Manager may be found in the administration guide.

File-Sharing Elements

The single server implementations NAS e7000 v2 supports several file-sharing protocols, including CIFS, NFS, FTP, HTTP, NCP, and AppleTalk. On each persistent storage manager element, folder or logical storage element, different file-sharing protocols can be enabled using specific network names for access across a network to a variety of clients.

Note: Persistent storage elements can only be viewed from Windows clients and are only supported under Windows file shares (CIFS).

Permissions can then be granted to those shares based on users or groups of users in each of the file-sharing protocols. Refer to the administration guide for more details on file system elements.

Clustered Server Elements

The NAS e7000 v2 supports several file-sharing protocols, including CIFS, NFS, FTP, HTTP, NCP, and AppleTalk. Only CIFS, NFS, and FTP are cluster aware protocols. NCP, HTTP, and AppleTalk can be installed on each node but the protocols can not be setup through cluster administrator nor will they failover during a node failure. Using Cluster Administrator, on each persistent storage management element, folder or logical storage element, different file-sharing protocols can be enabled by creating specific cluster resources.

Note: Persistent storage elements can only be viewed from Windows clients and are only supported under File Share resources (CIFS).

Network names and IP address resources for the clustered File Share resource may also be established for access across a network to a variety of clients. Permissions can then be granted to those shares based on users or groups of users in each of the file-sharing protocols. Refer to the cluster section of the administration guide for more details on file share elements.

Before You Begin

2

This chapter describes the preinitialization and configuration tasks required for the HP StorageWorks NAS e7000 v2.

Preinitialization

Before beginning the installation process, verify that the hardware installation is complete. Verify that the NAS e7000 v2 is completely installed in the rack and that all cables and cords are connected except for the fiber cables attached to the SAN switches. The setup utility documented here and in the next section only provide basic setup for the network components of the NAS e7000 v2.

Note: If you need assistance with rack installation or hardware connections, refer to the quick reference and rack installation guide included in the shipping carton.

Collect Information for Configuration

Choose a host name and collect general information before initializing the NAS e7000 v2.

Configuration Information

Collect the general information required to initialize the NAS device for both dynamic host configuration protocols (DHCP) and non-DHCP configurations. You will be asked for this information during configuration, as shown in [Table 2](#). Become familiar with this information before attempting to configure the NAS device.

Table 2: Configuration Information

| Part A: To Be completed for DHCP and non-DHCP configurations | | | |
|---|-------------------------------------|---------------------------------|-----------------|
| Server Host Name: | | | |
| Integrated Lights-Out Name: | Integrated Lights-Out Default User: | Integrated Lights-Out Password: | |
| Note: If NIC teaming is to be implemented, determine which ports will be teamed. Configure these Ethernet ports for DHCP protocol. For more information, refer to the Ethernet teaming features and procedures section of administrative procedures in the administration guide. | | | |
| Part B: To be completed for non-DHCP configurations only | | | |
| DNS Servers | | IP Address | |
| 1 | | | |
| 2 | | | |
| 3 | | | |
| NAS NIC Port* | IP Address | Subnet Mask | Gateway Address |
| Eth 0 10/100 | | | |
| Eth 1 10/100 | | | |
| Eth 2 10/100/1000 | | | |
| Integrated Lights-Out Eth port | | | |
| * The default NAS e7000 v2 has three Ethernet ports available for network connectivity. Disable ports that will not be used. Each Ethernet port must be configured with a separate subnet. Figure 6 and Table 3 in Chapter 3 illustrate the Nic Port assignments mentioned here. | | | |
| Part C: SNMP Information (optional) | | | |
| Trap Destination (IP Address) Manager Client: | | | |
| Management Traps Community String: | | | |
| System Management Community String: | | | |

Default Username and Passwords

Use the default username and passwords for your first login. To maintain security of the devices, change the passwords as soon as possible after first use.

The default username and password for administration of the server either through the Web UI or the console is

Username: Administrator

Password: [leave blank]

The default username and password for the systems management and ACU XE pages of the device are

Username: administrator

Password: administrator

Configuration Setup

3

This chapter provides information about configuring the HP StorageWorks NAS e7000 v2.

Before completing the tasks in this chapter, verify that the NAS e7000 v2 is installed in the rack and that all cables and cords are connected except for the fiber cables attached to the SAN switches. It is also necessary to collect certain information required during the configuration process, as mentioned in Chapter 2, “Before You Begin.”

Configuration Method

The method for configuring the NAS e7000 v2 is to use the WebUI configuration application that comes with the NAS e7000 v2.

WebUI Configuration

The NAS e7000 v2 includes a WebUI that is designed to be a graphical, easy-to-use application that gathers the necessary information for configuration. The WebUI may be accessed through two methods:

- Through auto discovery mode using the RapidLaunch utility
- By host name

Auto Discovery Method (Via RapidLaunch)

The NAS e7000 v2 includes a RapidLaunch CD that can run on any Windows-based PC using Internet Explorer 5.5 (or later).

Requirements

The following items are required to run the WebUI configuration application:

- Windows-based PC loaded with Internet Explorer 5.5 (or later) on the same network segment as the NAS e7000 v2
- RapidLaunch CD

Note: The NAS e7000 v2 is designed to be deployed without a monitor, keyboard, and mouse. These ports are available and supported by the NAS device, if used.

Procedure

To initialize the NAS e7000 v2 using the WebUI configuration application:



Caution: Do not power up the NAS device until steps 1 through 6 are completed.

1. Connect the Ethernet cables to the respective network ports of the NAS e7000 v2 and the corresponding network segments, in accordance with the information in the “Configuration Information” section in Chapter 2.
2. See [Figure 6](#) and [Table 3](#) for the locations of the network ports on the NAS e7000 v2.

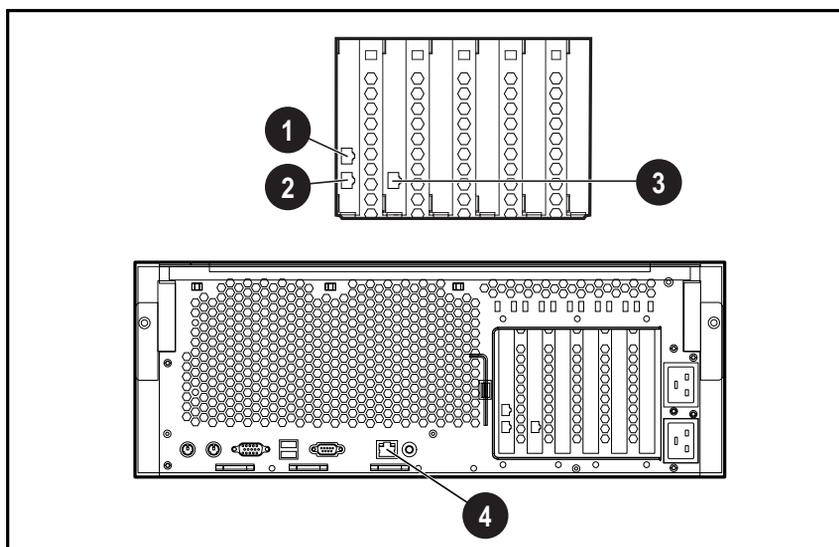


Figure 6: NAS e7000 v2 Ethernet connectors

Table 3: Ethernet Network Connectors

| Item | Description |
|------|---|
| 1 | NIC Ethernet port 1 (Eth 1) used for data or cluster management |
| 2 | NIC Ethernet port 0 (Eth 0) used for management |
| 3 | NIC Ethernet port 2 (Eth 2) used for data |
| 4 | Integrated Lights-Out Ethernet port (iLO Eth) |

Note: Connect a loopback cable to any of the NAS e7000 v2 Ethernet ports (Eth 0 through Eth 2) that is not configured for use. Do not connect a loopback cable to the Ethernet port on the Integrated Lights-Out (iLO Eth) port.

3. Verify that the Windows-based PC client is connected to the same subnet as the NAS e7000 v2.
4. Power on the Windows-based PC and wait until the operating system has completely loaded.
5. Insert the RapidLaunch CD into the DVD-ROM drive of the Windows-based PC.
6. The RapidLaunch CD should automatically run. If the program does not start up automatically, the program may be run manually. Click **Start**, then select **Run** on the Windows taskbar, and then type the following:

```
{CD ROM drive}:\setup.exe
```

Wait for the interface to start up.
7. Go to the NAS device and power it on. It will be several minutes before the NAS device is accessible on the network.
8. Return to the Windows-based PC. Select **StorageWorks NAS** from the **Show** drop down list to have RapidLaunch list all NAS devices on the network, as shown in [Figure 7](#).

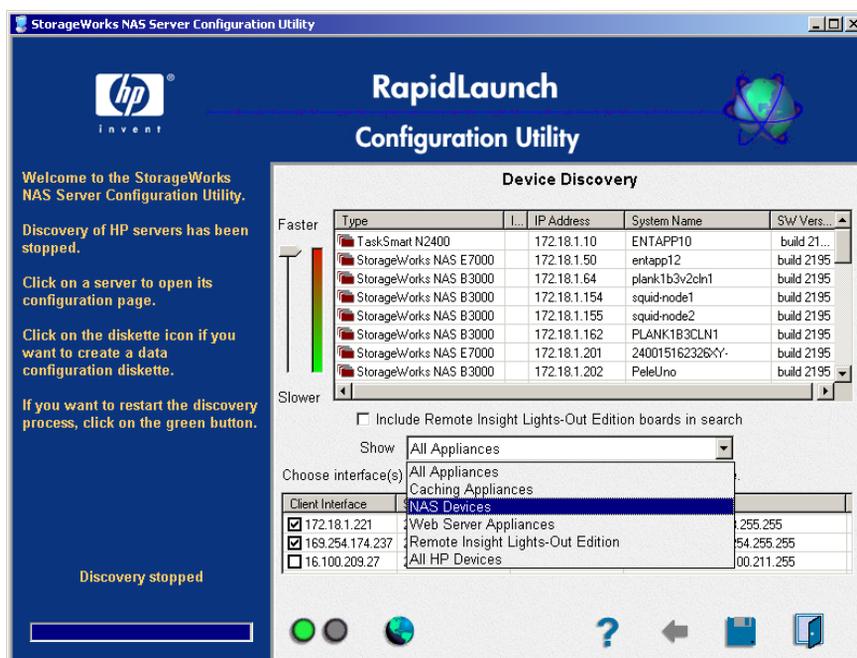


Figure 7: RapidLaunch search screen

- All the NAS devices found on the network are displayed as shown in [Figure 8](#). The NAS device will be displayed in the device discovery portion of the screen. It may take several minutes for the NAS device to be found on the network. The address range may need to be adjusted to find the device. To adjust the range, stop the discovery and left click on the search range cell and reset the search range to match with the interface ip address that the NAS device is attached to.

Note: The RapidLaunch utility will refresh periodically looking for new devices on the network. You may refresh the device list manually by selecting the **Refresh** button.

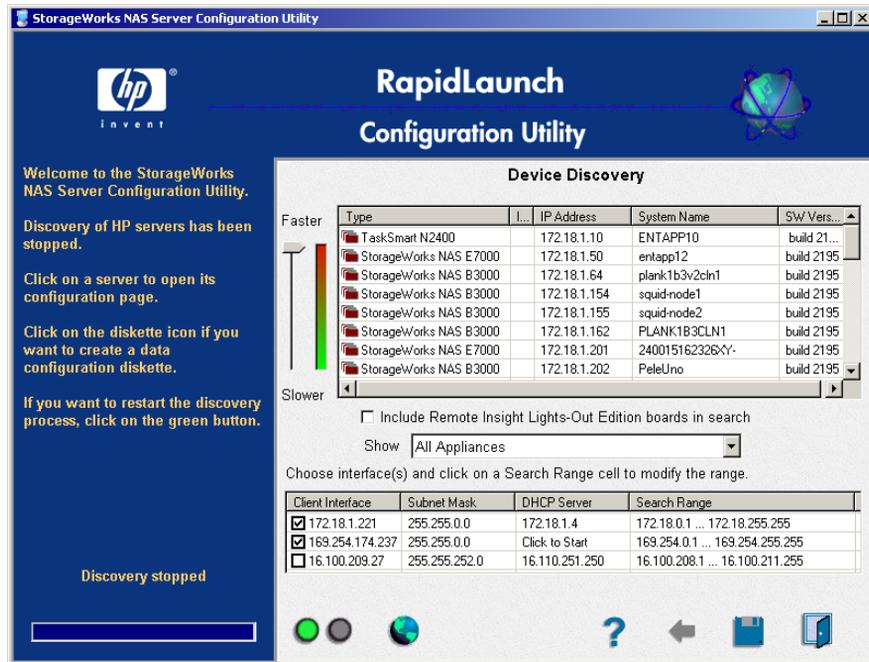


Figure 8: RapidLaunch device discovery screen

10. Select the unconfigured HP StorageWorks NAS e 7000 v2 device from the device list. This launches the WebUI configuration application (Rapid Startup) on the target HP StorageWorks NAS device as shown in Figure 9. A prompt for username and password will be presented. The default username is “Administrator” and the password is left blank.

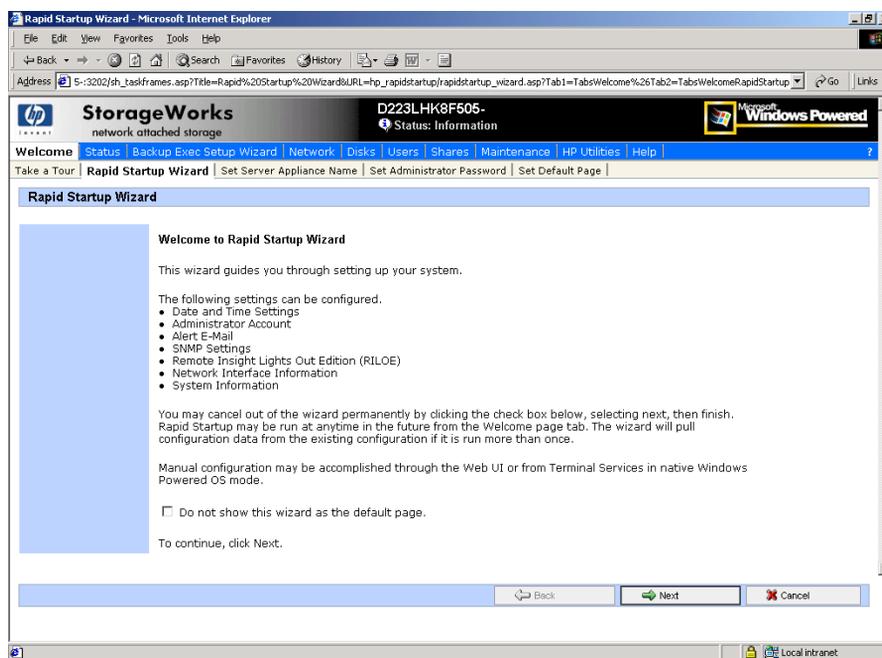


Figure 9: Rapid startup wizard screen

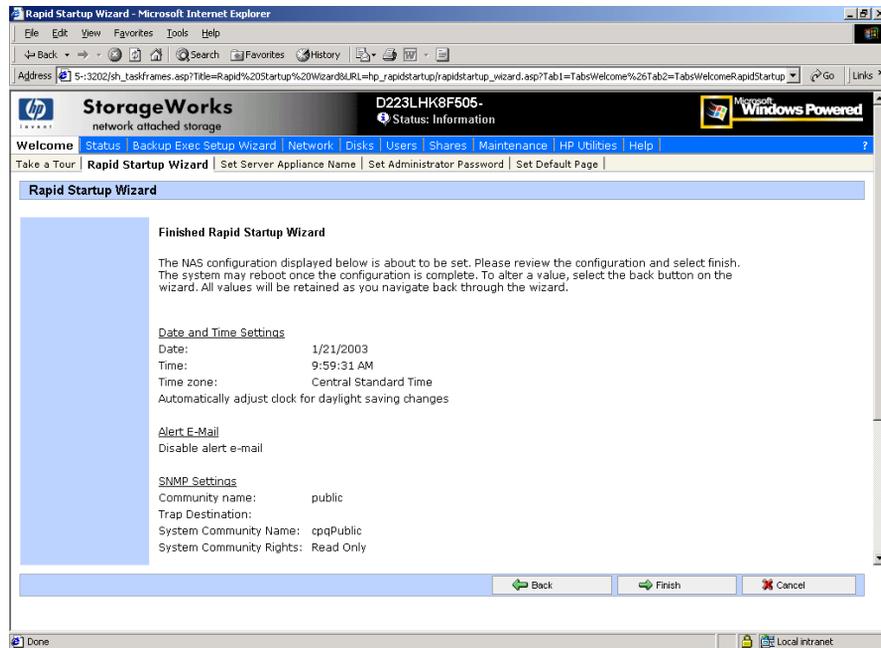


Figure 10: Rapid startup configuration review screen

11. Using the information from [Table 2](#) in Chapter 2, fill in the screens that follow. Verify that your information is correct when the configuration review screen is displayed as shown in [Figure 10](#). Online help is available for all pages by clicking the “?” in the right side of the Web UI.
12. Click the **Finish** icon to complete Rapid Startup. If a reboot is required, Rapid Startup will present a message that a reboot is occurring.
13. The browser will refresh to the status page of the NAS device. The refresh may take several minutes if the device was restarted. Click on the HP utilities tab and select the SAN Connection Tool. Do not connect storage until instructed to do so by the tool.
14. For cluster deployments only, repeat steps 7-13 with the second node. After the second node is configured, follow the online Cluster Install Guide found in the Cluster tab of the Web UI. Additional information can also be found in Chapter 4 of this document as well as the cluster section of the administration guide.
15. Exit the RapidLaunch utility and remove the RapidLaunch CD from the DVD-ROM drive and store it in a secure location.

Direct Access Method (Via Hostname)

The NAS e7000 v2 ships by default with DHCP enabled on the management port (Eth 0). If the system is placed on a DHCP serviced network and the serial number of the device is known, it can be accessed through a client running Microsoft Internet Explorer 5.5 (or greater) on that network via the 3201 port of the device. The serial number may be found on the front of the NAS e7000 v2.

Requirements

The following items are required to run the WebUI configuration application:

- Windows-based PC loaded with Microsoft Internet Explorer 5.5 (or greater) on the same segment as the NAS e7000 v2
- DHCP-serviced network
- DNS serviced network
- Serial number of the NAS e7000 v2

Note: The NAS e7000 v2 is designed to be deployed without a monitor, keyboard, and mouse. These ports are available and supported by the NAS device if used.

Procedure

To initialize the NAS e7000 v2 using the WebUI configuration application:

1. Connect the Ethernet cables to the respective network ports of the NAS e7000 v2 and the corresponding network segments in accordance with the information in the “Configuration Information” section in Chapter 2.
2. See [Figure 6](#) and [Table 3](#) for the locations of the network ports on the NAS e7000 v2.
3. Go to the NAS device and power it on. It will be several minutes before the NAS device is accessible on the network.
4. Open Internet Explorer on the Windows-based PC. Enter `http://`, the serial number of the NAS e7000 v2 followed by a hyphen (-), followed by `:3201`. Press **Enter**. This launches the WebUI configuration application (Rapid Startup) on the target StorageWorks NAS device as shown in [Figure 9](#).

Example: `http://D4059ABC3433-:3201`

Note: The NAS device will respond when the NAS operating system has started.

5. Using the information from [Table 3](#), fill in the screens that follow. Verify that your information is correct when the configuration review screen is displayed, as shown in [Figure 10](#). Online help is available for all pages by clicking the “?” in the right side of the Web UI.
6. Click the **Finish** icon to complete Rapid Startup. If a reboot is required, Rapid Startup will present a message that a reboot is occurring.
7. The browser will refresh to the status page of the NAS device. The refresh may take several minutes if the device was restarted. Click on the HP utilities tab and select the SAN Connection Tool. Do not connect storage until instructed to do so by the tool.
8. For cluster deployments only, repeat steps 3 - 7 with the second node. After the second node is configured, follow the online Cluster Install Guide found in the Cluster tab of the Web UI. Additional information can also be found in Chapter 4 of this document as well as the cluster section of the administration guide.

Completing the System Configuration

After the configuration process, there are additional tasks required in order to begin sharing files on the network. All procedures for the configuration tasks may be found in the NAS e7000 v2 administration guide. These include:

- Configuring physical storage using the appropriate storage configuration utility for the SAN that is in use. If this is a cluster install, please read Chapter 4 of this guide or the cluster section of the administration guide.
- Configuring the logical storage using the Logical Disk Manager by selecting Disks and Volumes from the Disk Tab of the Web UI. If this is a cluster install, please read Chapter 4 of this guide or the cluster section of the administration guide.
- Establishing file folders and file shares using the Shares Tab of the Web UI. If this is a cluster install, please read the cluster section of the administration guide for special setup procedures.
- Creating Local Users and Groups if desired from the Users Tab of the Web UI. This step may not be required in environments where a domain is present.
- Creating access permissions to the folders and shares. If this is a cluster install, please read the cluster section of the administration guide for special setup procedures.
- Activating the iLO key (locate the Integrated Lights-Out Advanced Pack License Installation Card found in the country kit and follow the enclosed instructions).

In addition to the required configuration steps, several optional tasks may need to be completed:

- Enabling additional protocols and the associated file shares
- Installing and configuring NIC teaming

Beyond Initial Setup

4

This chapter describes the procedures required to configure the HP StorageWorks NAS e7000 v2 on a SAN and those steps necessary to establish a cluster.

All documentation and tools are available online via the Web UI. Documentation is repeated here and in the *HP StorageWorks NAS e7000 v2 Administration Guide*.

Note: The user should read the SAN connection and cluster management sections in the administration guide prior to beginning the configuration of the NAS on a SAN or establishing the cluster.

Connecting to the SAN

The e7000 v2 is designed to connect to all HP SAN storage including Modular SAN Array 1000 (MSA1000), Modular Arrays, Virtual Arrays (VA), Disk Arrays XP, and Enterprise Virtual Arrays. The SAN Connection Tool included in the HP Utilities tab of the Web UI provides all of the necessary steps for connecting to the various HP SANs.

SAN Connection Tool

The SAN Connection Tool will aid in connecting to SAN storage. Prior to running the SAN Connection Tool, check the HP website (www.hp.com) for possible updates.

- Context-sensitive help for the SAN Connection Tool can be obtained by selecting the question mark (?) at the far right of the primary navigation bar. Online help includes steps for flashing FCA2101 firmware.
- Do not connect fiber cables until the tool indicates that the cables may be attached.
- The SAN Connection Tool only supports the FCA2101 HBA. If another supported HBA is used, refer to that HBA's documentation for configuration information.

The first screen of the SAN Connection Tool includes an overview and a checklist of items that are required for successful connection to the storage. Subsequent screens include SAN storage selection and the selection of the type of fiber path desired. Lastly, the final screen provides all of the necessary steps required to successfully connect to the SAN.

Modular SAN Array 1000 Requirements

- When connecting to an MSA, the HP StorageWorks NAS only supports MSA firmware version 2.38 and earlier. MSAs with a firmware version of 1.xx must be flashed with the free upgrade to version 2.38 (available at www.hp.com). This upgrade will need to occur before connecting the MSA to an HP StorageWorks NAS device.
- When connecting to an MSA1000, the FCA2101 firmware must be flashed to 3.82a1 prior to running the SAN Connection tool.
- SecurePath (the multipath fiber software for the MSA1000) is included with the HP StorageWorks NAS device.

Modular Array Requirements

- When connecting to a Modular SAN Array, the FCA2101 firmware must be flashed to 3.82a1 prior to running the SAN Connection tool.
- SecurePath (the multipath fiber software for the Modular SAN Array) is included with the HP StorageWorks NAS device.
- When connecting to the Modular SAN Array, versions 8.6 and 8.7 of the firmware are supported.

Virtual Array Requirements

- If connecting to a Virtual Array, the FCA2101 firmware must be flashed to 3.90a7 prior to running the SAN Connection tool.
- When connecting to a VA in conjunction with multipath fiber, AutoPath is required. AutoPath licensing is not included with the HP StorageWorks NAS device and must be purchased separately. However, the AutoPath software is included in the HP StorageWorks NAS Device for availability at the time of installation. Purchase of the license is required.

Disk Array XP Requirements

- If connecting to a Disk Array XP, the FCA2101 firmware must be flashed to 3.90a7 prior to running this tool.
- When connecting to a XP in conjunction with multipath fiber, AutoPath is required. AutoPath licensing is not included with the HP StorageWorks NAS device and must be purchased separately. However, the AutoPath software is included in the image for availability at the time of installation. Purchase of the license is required.

Enterprise Virtual Array Requirements

- If connecting to an Enterprise Virtual Array, the FCA2101 firmware must be flashed to 3.82a1 prior to running the SAN Connection tool.
- SecurePath (the multipath fiber software for the Enterprise Virtual Array) is included with the HP StorageWorks NAS device.
- When connecting to the Enterprise Virtual Array, version 2.0 of the VCS is supported.

Introduction To Establishing a NAS Cluster

The Cluster Install Guide is available in the Cluster tab of the Web UI and is a web-based guide designed to help the user install an HP StorageWorks NAS e7000 v2 cluster. The online guide provides the necessary information required to configure storage, configure the NAS e7000 v2 in preparation for clustering, setting up cluster services, establishing the cluster and lastly installing updates to make programs cluster aware.

The steps provided are necessary to cluster HP StorageWorks NAS servers.

Confirm that the following specifications have been met before proceeding:

- When connecting to an MSA, the HP StorageWorks NAS only supports MSA firmware version 2.38 and earlier. If using an MSA with firmware version 1.xx then obtain the free upgrade from the link provided at www.hp.com. This upgrade will need to occur before connecting the MSA to an HP StorageWorks NAS device.
- The SAN connection tool must be completed and all the necessary software components for connecting to the desired storage must be installed before the configuration of cluster services.
- It is required that at least one LUN has been presented for the configuration of the Quorum disk. Additional LUNS may also be presented for use as shared disk resources.

More detailed information about setting up clusters is available at:

<http://www.microsoft.com/windows2000/techinfo/planning/server/clustersteps.asp>

Each node of the cluster will be shut down during the Cluster Setup. Please be sure to view this guide on a computer other than the two nodes to be clustered. You may want to print this guide.

HP StorageWorks NAS Software Updates

Please be sure to read the section at the end of this document which discusses the process to update HP StorageWorks NAS software to clustered versions. This should only be done after the Cluster is install is complete and must be run on **both cluster nodes**.

Checklists for Cluster Server Installation

The following will assist in preparing for installation. Step-by-step instructions begin after these items have been discussed.

- Network Requirements
- Shared Disk Requirements

Network Requirements

- A unique NetBIOS cluster name.
- Seven unique, static IP addresses: two for the network adapters on the private network, two for the network adapters on the public network, two for the virtual server resources, and one for the cluster itself.
- A domain user account for Cluster service (all nodes must be members of the same domain).
- Each node should have two network connections—one for connection to the public network and the other for the node-to-node private cluster network. If only one network adapter for both connections is used, the configuration is not supported. A separate private network adapter is required for HCL certification.

Shared Disk Requirements

Note: Do not let both nodes access the shared storage devices at the same time until Cluster service is installed on at least one node and that node is online. This can be accomplished through selective storage presentation, SAN switch zoning or having only one node online at all times.

- All software components listed in the SAN connection tool must be installed and the fiber cables attached to the HBA(s) before the cluster installation is started.
- All shared disks must be accessible from both nodes, but not at the same time. See the previous note.
- All shared disks must be configured as basic (not dynamic).
- All partitions on the disks must be formatted as NTFS.

Cluster Installation

Installation Overview

During the installation process, both nodes will be shut down and both nodes will be rebooted. These steps are necessary to guarantee that the data on disks that are attached to the shared storage bus is not lost or corrupted. This can happen when multiple nodes try to simultaneously write to the same disk that is not yet protected by the cluster software.

Use [Table 4](#) to determine which nodes and storage devices should be presented during each step.

Table 4: Power Sequencing for Cluster Installation

| Step | Node 1 | Node 2 | Storage | Comments |
|------------------------------|--------|--------|---------------|---|
| Setting up networks | On | On | Not presented | Verify that all storage devices on the shared bus are not presented. Power on both nodes. |
| Setting up shared disks | On | Off | Presented | Shut down both nodes. Present the shared storage, and then power on the first node. |
| Verifying Disk Configuration | Off | On | Presented | Shut down first node, power on second node. |
| Configuring the First Node | On | Off | Presented | Shutdown all nodes; power on the first node. |
| Configuring the Second Node | On | On | Presented | Power on the second node after the first node was successfully configured. |
| Post-installation | On | On | Presented | At this point all nodes should be on. |

To configure the Cluster service on the HP StorageWorks NAS server, the account must have administrative permissions on each node. Both nodes must be member servers within the same domain.

Configure the Private Network Adapter

The following procedures are Best Practices provided by Microsoft and should be configured on the private network adapter.

- On the General tab of the private network adapter, deselect all items except TCP/IP.
- In the DNS tab under advanced settings for the private network adapter, deselect **Register this connection's addresses in DNS**.
- Ensure that the Link Speed and Duplex is set to 100Mbps/Full Duplex under the advanced tab for the Ethernet card used for the private network adapter.
- If a network adapter is in a disconnected state during installation, the Cluster service does not detect the adapter because there are no protocols bound to the adapter. If Media Sense is disabled the network adapter still shows the "disconnected" status, but the cluster installation process can detect the adapter as available for cluster communication. To make this change, refer to the online guide.

If the private network connection is made using a crossover cable, then the procedures outlined in Knowledge Base (KB) article Q242430 (<http://support.microsoft.com/support/kb/articles/Q242/4/30.ASP>) should be followed and the node rebooted prior to installing Cluster service. If this procedure is not completed, and the second node is powered off while installing Cluster service on the first node, the private network adapter may not be detected. This will prevent configuring the adapter during Cluster service installation. However, after Cluster service is installed on both nodes and both nodes are powered on, the adapter can be added as a cluster resource and configured properly for the private network in Cluster Administrator.

Configure the Public Network Adapter

While the public network adapter's IP address can be automatically obtained if a DHCP server is available, this is not recommended for cluster nodes. HP strongly recommends setting static IP addresses for all network adapters in the cluster, both private and public. If IP addresses are obtained via DHCP, access to cluster nodes could become unavailable if the DHCP server goes down. If you must use DHCP for the public network adapter, use long lease periods to assure that the dynamically assigned lease address remains valid even if the DHCP service is temporarily lost. In all cases, set static IP addresses for the private network connector.

Keep in mind that Cluster service will recognize only one network interface per subnet. For assistance with TCP/IP addressing in Windows 2000, please see Windows 2000 Online Help at:

<http://www.microsoft.com/windows2000/techinfo/proddoc/default.asp>

Rename the Local Area Network Icons

HP recommends changing the names of the network connections for clarity. The naming will help identify a network and correctly assign its role.

Verifying Connectivity and Name Resolution

To verify name resolution, ping each node from a client using the node's machine name instead of its IP number.

Verifying Domain Membership

Both nodes in the cluster must be members of the same domain and able to access a domain controller and a DNS Server.

Setting Up a Cluster User Account

The Cluster service requires a domain user account under which the Cluster service can run. This user account must be created before installing Cluster service, because setup requires a user name and password. This user account should not belong to a user on the domain. This user account will need to be granted administrator privileges.

About the Quorum Disk

To proceed, power off both nodes. Power up node one.

The quorum disk is used to store cluster configuration database checkpoints and log files that help manage the cluster. The quorum disk must be a shared disk resource. Follow these quorum disk recommendations:

- Dedicate a separate disk for a quorum disk. As the failure of the quorum disk would cause the entire cluster to fail, HP strongly recommends that the disk be a RAID 1 configuration.
- Write a basic signature and create a small partition. A minimum of 50 megabytes should be used as a quorum disk. HP recommends that a quorum disk be 500 MB.
- Assign the letter Q to the drive. Label the volume quorum.

Configuring Shared Disks

Use Disk Management to configure the quorum and shared disk resources. Verify that all shared disks are formatted as **NTFS** and are designated as **Basic**.

Verifying Disk Access and Functionality

Write a file to each shared disk resource to verify functionality.

At this time, shut down the first node, power on the second node and repeat the *Verifying Disk Access and Functionality* step. When it has been verified that both nodes can read and write from the disks, turn off the second node and power on the first, and then continue with this guide.

Install Cluster Service Software

Configuring the First Node

Note: During installation of Cluster service on the first node, the second node must either be turned off, or stopped prior to the HP StorageWorks NAS server booting. All shared storage devices should be powered up.

In the first phase of installation, all initial cluster configuration information must be supplied so that the cluster can be created. This is accomplished using the **Cluster Service Configuration Wizard**. All cluster setup and administration activities must be accessed via the Windows 2000 graphical user interface (GUI) available through terminal services, the iLO port, or a directly attached keyboard and mouse connection.

1. Click **Start**, click **Settings**, and click **Control Panel**.
2. Double click **Add/Remove Programs**.
3. Double click **Add/Remove Windows Components**.
4. Select **Cluster Service**. Click **Next**.
5. When prompted for files on the Windows Powered OS CD or the Windows 2000 SP3 cd, browse to the directory **C:\Compaq\Windows Components\i386**.
6. The window shown in [Figure 11](#) opens. Click **I Understand** to accept the condition that Cluster service is supported on hardware from the Hardware Compatibility List only.

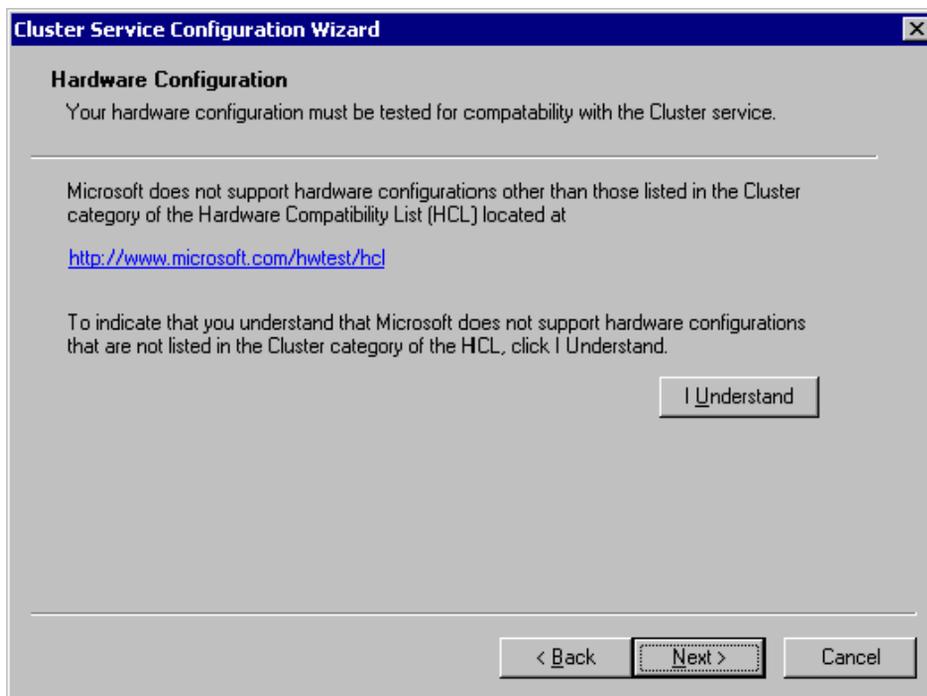


Figure 11: Hardware configuration certification screen

7. Because this is the first node in the cluster, the cluster must be created. Select **The first node in the cluster**, as shown in [Figure 12](#) and then click **Next**.

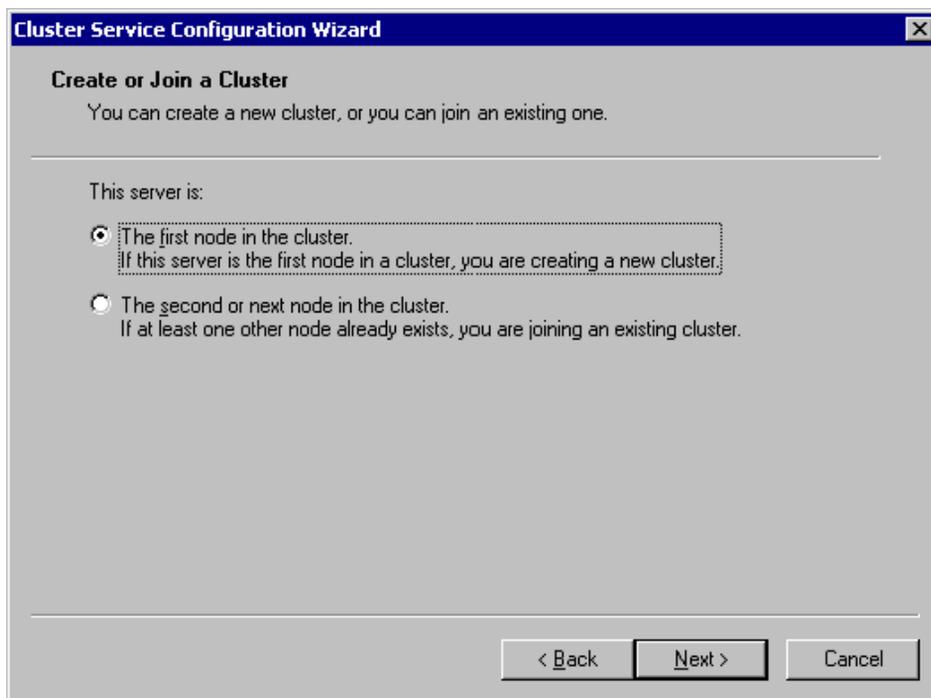


Figure 12: Creating a new cluster

8. Enter a name for the cluster (up to 15 characters), and click **Next**. (In the example, the cluster name is **MyCluster**.)
9. Type the **user name** and **password** of the cluster service account that was created during the pre-installation. Type the **domain name**, and click **Next**.
At this point, the **Cluster Service Configuration Wizard** validates the user account and password.
10. Click **Next**.

Configuring Cluster Disks

Note: By default, all SCSI disks not residing on the same bus as the system disk will appear in the Managed Disks list. Therefore, if the node has multiple SCSI buses, some disks may be listed that are not to be used as shared storage (for example, an internal SCSI drive.) Such disks should be removed from the Managed Disks list.

1. The **Add or Remove Managed Disks** dialog box shown in [Figure 13](#) specifies which shared disks will be used by Cluster service. Add or remove disks as necessary and then click **Next**.

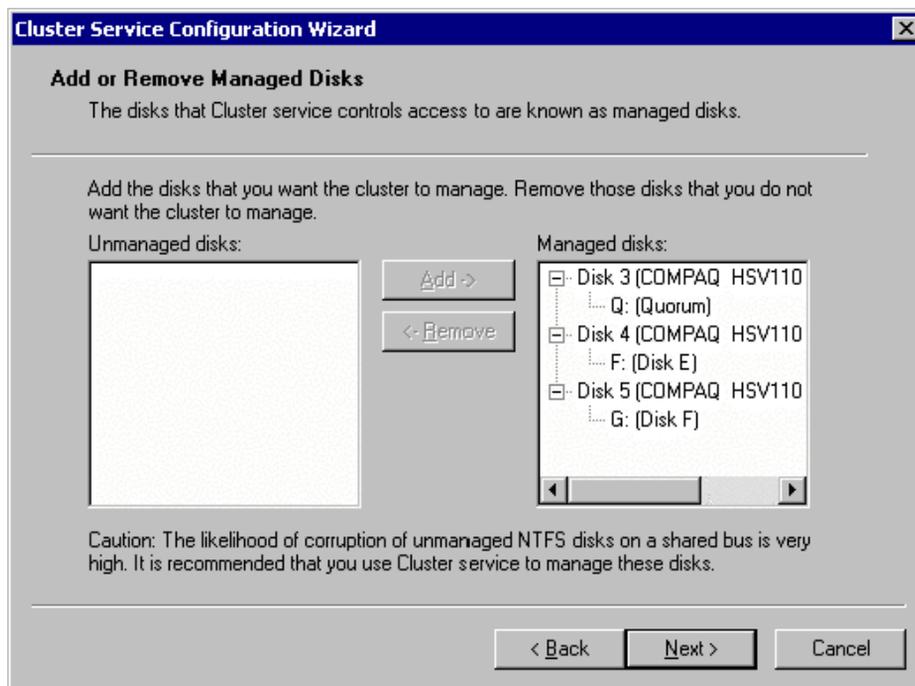


Figure 13: Adding or removing managed disks

2. Click **Next**.

In production clustering scenarios, more than one private network for cluster communication must be used to avoid having 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 for these roles. It is possible to use a public network for cluster management, or use a mixed network for both private and public communications. In any case, make sure at least two networks are used for cluster communication, as using a single network for node-to-node communication represents a potential single point of failure. HP recommends that multiple networks be used, with at least one network configured as a private link between nodes and other connections through a public network. If more than one private network exists, make sure that each uses a different subnet, as Cluster service recognizes only one network interface per subnet.

This document is built on the assumption that only two networks are in use. It shows how to configure these networks as one mixed and one private network.

The order in which the **Cluster Service Configuration** Wizard presents these networks may vary. In this example, the public network is presented first.

3. Click **Next** in the **Configuring Cluster Networks** dialog box.
4. Make sure that the network name and IP address correspond to the network interface for the *public* network.
5. Check the box **Enable this network for cluster use**.
6. Select the option **All communications (mixed network)** as shown in [Figure 14](#).
7. Click **Next**.

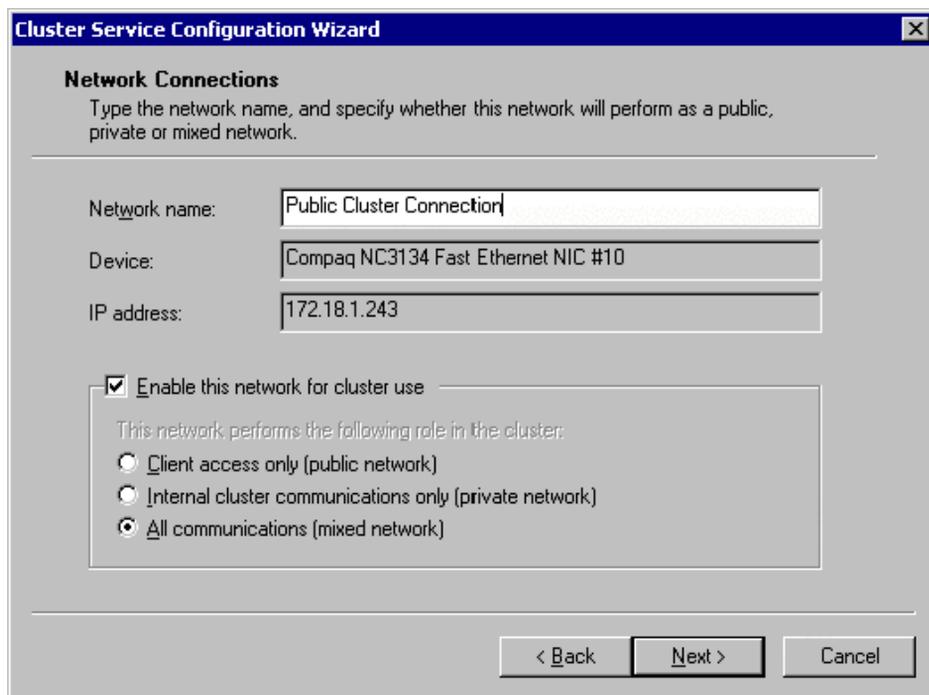


Figure 14: Public network connection

8. The next dialog box shown in [Figure 15](#) configures the private network. Make sure that the network name and IP address correspond to the network interface used for the *private* network.
9. Check the box **Enable this network for cluster use**.
10. Select the option **Internal cluster communications only**.

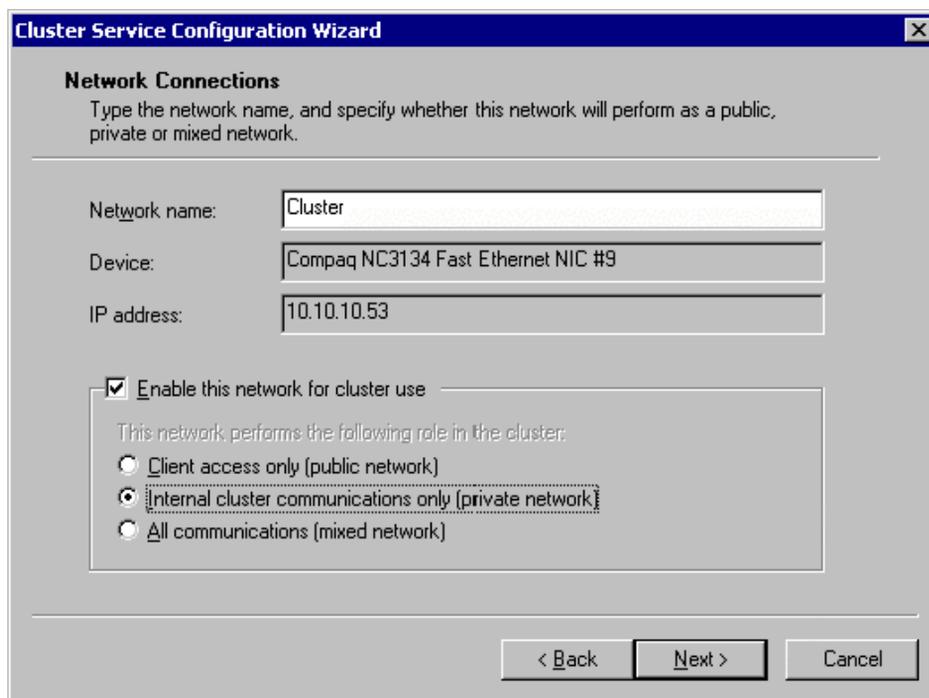


Figure 15: Private network connection

11. Click **Next**.
12. In this example, both networks are configured in such a way that both can be used for internal cluster communication. The next dialog window offers an option to modify the order in which the networks are used. Because **Private Cluster Connection** represents a direct connection between nodes, it is left at the top of the list. In normal operation this connection will be used for cluster communication. In case of the **Private Cluster Connection** failure, cluster service will automatically switch to the next network on the list—in this case **Public Cluster Connection**. Make sure the first connection in the list is the Private Cluster Connection and click **Next**.

Note: Always set the order of the connections so that the Private Cluster Connection is first in the list.

13. Enter the unique cluster **IP address** and **Subnet mask**, and click **Next**.

Cluster Service Configuration Wizard

Cluster IP Address
The IP address identifies the cluster to the network.

Type the IP address for management of the cluster. The subnet mask may be supplied automatically.

IP address: 172 . 18 . 1 . 16

Subnet mask: 255 . 255 . 0 . 0

Select the public network from which clients gain access to the cluster.

Network: Public Cluster Connection

< Back Next > Cancel

Figure 16: Cluster IP Address

The **Cluster Service Configuration** Wizard shown in [Figure 16](#) automatically associates the cluster IP address with one of the public or mixed networks. It uses the subnet mask to select the correct network.

14. Click **Finish** to complete the cluster configuration on the first node.

The **Cluster Service Setup** Wizard completes the setup process for the first node by copying the files needed to complete the installation of Cluster service. After the files are copied, the Cluster service registry entries are created, the log files on the quorum resource are created, and the Cluster service is started on the first node.

A dialog box is displayed confirming that Cluster service has started successfully.

15. Click **OK**.

16. Close the **Add/Remove Programs** window.

Validating the Cluster Installation

Use the Cluster Administrator snap-in to validate the Cluster service installation on the first node.

1. Click **Start**.
2. Click **Programs**.
3. Click **Administrative Tools**.
4. Click **Cluster Administrator**.

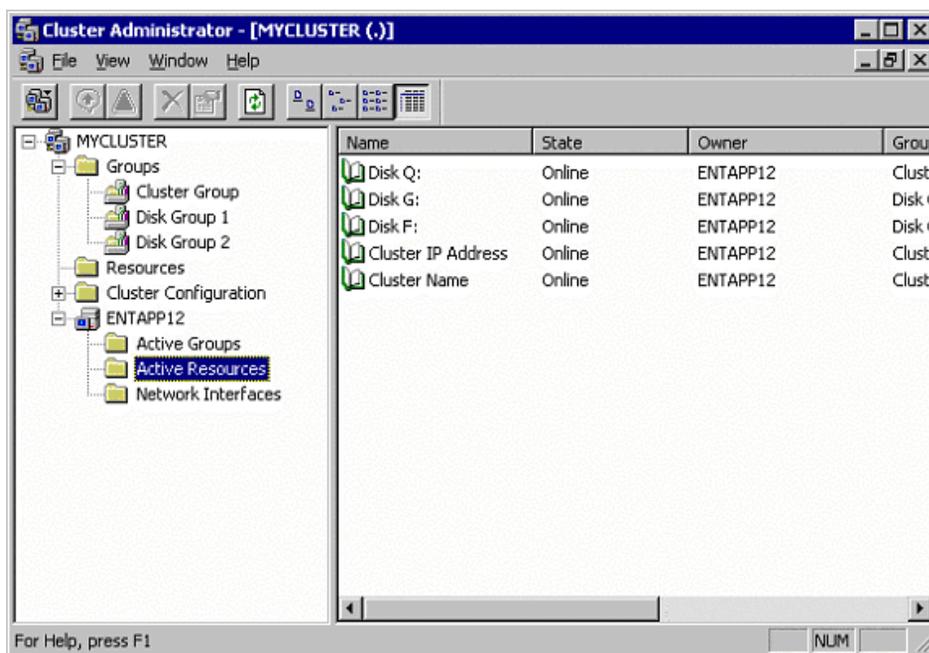


Figure 17: Cluster administrator

If the snap-in window is similar to that shown in [Figure 17](#), the Cluster service was successfully installed on the first node. It is now possible to install the Cluster service on the second node.

Configuring the Second Node

Note: For this section, leave the first node on and power up the second node.

Installing Cluster service on the second node requires less time than on the first node. Setup configures the Cluster service network settings on the second node based on the configuration of the first node.

Installation of Cluster service on the second node begins exactly as for the first node. During installation of the second node, the first node must be running.

Follow the same procedures used for installing Cluster service on the first node, with the following differences:

1. In the **Create or Join a Cluster** dialog box, select **The second or next node in the cluster**, and click **Next**.
2. Enter the cluster name that was previously created (in this example, **MyCluster**), and click **Next**.
3. Leave **Connect to cluster as** unchecked. The **Cluster Service Configuration Wizard** will automatically supply the name of the user account selected during the installation of the first node. Always use the same account used when setting up the first cluster node.
4. Enter the password for the account (if there is one) and click **Next**.
5. At the next dialog box, click **Finish** to complete configuration.
6. The Cluster service will start. Click **OK**.
7. Close **Add/Remove Programs**.

Verifying Installation

There are several ways to verify a successful installation of Cluster service. Here is a simple one:

1. Click **Start>Programs>Administrative Tools** and click **Cluster Administrator**.

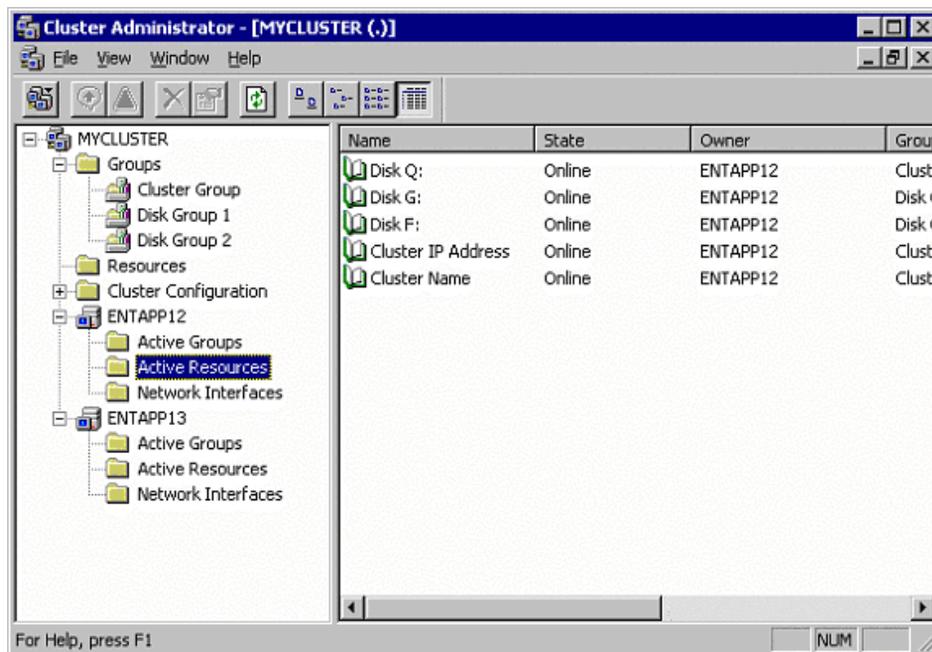


Figure 18: Cluster Resources

The presence of two nodes (Entapp12 and Entapp13 in [Figure 18](#)) shows that a cluster exists and is in operation.

2. Right-Click on one of the groups and select the option **Move**. The group and all its resources will be moved to the other node. After a short period of time the cluster resources will be brought online on the second node. While watching the screen, a shift will occur. Close the **Cluster Administrator** snap-in.
3. If this test fails then the cluster configuration was not successful. Further information can be found in the event logs and it may be necessary to reinstall cluster services on one of the nodes.

Installation of Cluster service on both nodes is complete. The server cluster is fully operational.

HP StorageWorks NAS Software Updates

Once cluster installation is complete, it is necessary to upgrade Services for Unix and NAS DataCopy (if installed) to make them cluster aware. Select the link at the bottom of the Cluster Setup Guide located under the HP Utilities tab in the WEB User Interface to perform the software updates. If DataCopy is installed after the cluster is installed, DataCopy will automatically become cluster aware.

Note: Complete this procedure on both cluster nodes.

Configuring Physical Disk Resources after the Cluster Install is Complete

Once the cluster installation is complete it may be necessary to add additional physical disk resources into the cluster. The procedure outlines the steps to complete this process. This can be accomplished at the server console, or remotely through terminal services or the iLO port.

- Present the LUN(s) to Node A, do not present the LUN(s) to Node B at this time.
- On Node A, open Disk Manager and write the disk signatures and create the partitions. Remember that disks can only be basic in a cluster.
 - To open Disk Manager select Start-Run-diskmgmt.msc.
 - A volume label must be assigned when the partition is formatted.
- On Node A, open Cluster Administrator and create the Physical Disk Resources.
 - Select Start-Run-Cluadmin . to open Cluster Administrator.
 - To create a physical disk resource in Cluster Administrator select File-New-Resource.
 - If the new disks do not appear in the disk selection list, Node A must be rebooted.
- After all new LUN(s) have been added to the cluster, present the LUN(s) to Node B.
- On Node B, open Device Manager and scan for new devices.
- Move the new Physical Disk Resources to Node B.
 - To move the Physical Disk Resource, right click on the cluster group the disk resides in and select Move Group.

A

audience 8
authorized reseller, HP 12

B

before you begin 31

C

cautions
 data loss 26
 file corruption 26
cluster administrator, illustrated 63
cluster disks, configuring 58
cluster installation, overview 52
cluster installation, validating 63
cluster IP address, illustrated 62
cluster resources, illustrated 65
cluster server installation, checklist 51
cluster service software, installing 55
configuration
 collect information 32
 from RapidLaunch CD 36
 WebUI 36
configuration methods 36
configuration options 16
configuration See also configuration tasks 36
configuration setup 35
configuration tasks
 complete the system configuration 45
 preinitialization 31
conventions
 document 9

equipment symbols 10
text symbols 9
creating a new cluster, illustrated 57

D

deployment
 StorageWorks NAS e7000 v2, cluster 20
 StorageWorks NAS e7000 v2, single device 19
DHCP (dynamic host configuration protocol)
 defined 32
disk access and functionality, verifying 55
disk array XP, requirements 49
document
 conventions 9
 prerequisites 8
 related documentation 8
dynamic host configuration protocol See DHCP 32

E

enterprise virtual array, requirements 49
equipment symbols 10
Ethernet connectors, illustrated 37
Ethernet ports
 configuring 33

F

first node, configuring 55

G

getting help 12

H

hardware configuration certification screen,
illustrated 56
help, obtaining 12
host configuration protocols, DHCP and
nonDHCP 32
HP
authorized reseller 12
storage website 12
technical support 12

I

illustrations
Ethernet connectors 37
installation, verifying 64
intended audience 8, 14

M

managed disks
adding or removing, illustrated 58
modular array, requirements 49
MSA1000, requirements 48

N

NAS cluster, establishing 50
NAS software updates 66
network requirements 51

P

physical disk resources, configuring 66
preinitialization
collect information for configuration 32
preinitialization tasks 31
prerequisites 8
private network adapter, configuring 53
private network connection, illustrated 61
product overview 13
public network adapter, configuring 53
public network connection, illustrated 60

Q

quorum disk 54

R

rack stability, warning 11
Rapid startup wizard screen, illustrated 41
RapidLaunch CD
used for configuration 38
RapidLaunch device discovery screen,
illustrated 40
RapidLaunch search screen, illustrated 39
RapidLaunch startup configuration review
screen, illustrated 42
redundant path
multi-bus failover 16
transparent failover 16
related documentation 8

S

SAN connection 48
SAN connection tool 48
SAN requirements
MSA1000 48
SAN requirements, general 48
SAN, connecting to 48
second node, configuring 64
setup
related documents 22
setup and configuration
NAS b3000 v2 as a single device 22
stand alone NAS 22, 23
shared disk, requirements 51
shared disks, configuring 55
snapshots
effects on virtual disk 29
facts 29
write locality 29
software features 15
software updates 50
storage management
file sharing elements 30

- file system elements [28](#)
- logical storage elements [29](#)
- persistent storage management elements [29](#)
- storage elements [28](#)
- storage management elements [26](#)
- storage management overview [26](#)
- storage management process, illustrated [27](#)
- StorageWorks NAS b3000 v2
 - setup and configuration overview [22](#)
 - setup and configuration overview, as a clustered pair [23](#)
- StorageWorks NAS e7000 v2
 - configuration [35](#)
 - deployment configurations [16](#)
 - setup and configuration overview, clustered NAS [23](#)
 - single device deployment [19](#)
- StorageWorks NAS e7000 v2 as a clustered pair of devices, illustrated [18](#)
- StorageWorks NAS e7000 v2 as a device, illustrated [17](#)
- StorageWorks NAS e7000 v2 cluster deployment, illustrated [21](#)
- StorageWorks NAS e7000 v2 single device deployment, illustrated [20](#)
- StorageWorks NAS e7000 v2, as a single device [16](#)
- symbols in text [9](#)

- symbols on equipment [10](#)

T

- tables

- Ethernet Network Connectors [38](#)

- Power Sequencing for Cluster Installation [52](#)

- technical support, HP [12](#)

- text symbols [9](#)

V

- virtual array, requirements [49](#)

W

- warning

- rack stability [11](#)

- symbols on equipment [10](#)

- websites

- HP storage [12](#)

- WebUI configuration [36](#)

- auto discovery method [36](#)

- auto discovery method requirements [36](#)

- auto discovery procedure [37](#)

- direct access procedure [43](#)

- WebUI initialization

- direct access method (via hostname) [43](#)

- direct access requirements [43](#)

