StorageWorks NAS Executor E7000

Quick Start Guide

Part Number 259129-001

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This quick start guide provides information about how to deploy the NAS E7000 as a single device or as a clustered node attached to a storage area network (SAN).

COMPAQ

Compaq StorageWorks NAS Executor E7000 Quick Start Guide

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About This Guide

This guide provides step-by-step instructions for deployment of the Compaq *StorageWorks™* NAS Executor E7000 as a single device or as a clustered node attached to a storage area network (SAN).

Intended Audience

This guide is intended for administrators experienced in server, cluster, and network installations and SAN administration.

⚠ Important Safety Information

Before installing this product, read the *Important Safety Information* document provided.

Symbols on Equipment

The following symbols may be placed on equipment to indicate the presence of potentially hazardous conditions:

> **WARNING: This symbol, in conjunction with any of the following symbols, indicates the presence of a potential hazard. The potential for injury exists if warnings are not observed. Consult your documentation for specific details.**

This symbol indicates the presence of hazardous energy circuits or electric shock hazards. Refer all servicing to qualified personnel.

WARNING: To reduce the risk of injury from electric shock hazards, do not open this enclosure. Refer all maintenance, upgrades, and servicing to qualified personnel.

This symbol indicates the presence of electric shock hazards. The area contains no user or field serviceable parts. Do not open for any reason.

WARNING: To reduce the risk of injury from electric shock hazards, do not open this enclosure

This symbol on an RJ-45 receptacle indicates a network interface connection.

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

This symbol indicates the presence of a hot surface or hot component. If this surface is contacted, the potential for injury exists.

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

These symbols, on power supplies or systems, indicate that the equipment is supplied by multiple sources of power.

WARNING: To reduce the risk of injury from electric shock, remove all power cords to completely disconnect power from the system.

This symbol indicates that the component exceeds the recommended weight for one individual to handle safely.

Weight in kg
Weight in lb **WARNING: To reduce the risk of personal injury or damage to the equipment, observe local occupational health and safety requirements and guidelines for manual material handling.**

Rack Stability

⚠ **WARNING: To reduce the risk of personal injury 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.**

- **The stabilizing feet are attached to the rack if it is a single-rack installation.**

- **The racks are coupled in multiple-rack installations.**

- **Only one component is extended at a time. A rack may become unstable if more than one component is extended for any reason.**

Symbols in Text

These 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 loss of life.**

△ **CAUTION:** Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of information.

IMPORTANT: Text set off in this manner presents clarifying information or specific instructions.

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

Text Conventions

This document uses the following conventions:

- *Italic type* is used for complete titles of published guides or variables. Variables include information that varies in system output, in command lines, and in command parameters in text.

- Bold type is used for emphasis, for onscreen interface components (window titles, menu names and selections, button and icon names, and so on), and for keyboard keys.

- `Monospace typeface` is used for command lines, code examples, screen displays, error messages, and user input.

- Sans serif typeface is used for uniform resource locators (URLs).

Related Documents

For additional information on the topics covered in this guide, refer to the following documentation:

- Rack Installation and Connection Card

- Administration Guide

- Hardware Reference Guide

Getting Help

If you have a problem and have exhausted the information in this guide, you can get further information and other help in the following locations.

Compaq Technical Support

In North America, call the Compaq Technical Support Phone Center at
1-800-OK-COMPAQ. This service is available 24 hours a day, 7 days a week. For
continuous quality improvement, calls may be recorded or monitored. Outside North
America, call the nearest Compaq Technical Support Phone Center. Telephone
numbers for worldwide Technical Support Centers are listed on the Compaq website,
www.compaq.com.

Be sure to have the following information available before you call Compaq:

- Technical support registration number (if applicable)

- Product serial number

- Product model name and number

- Applicable error messages

- Add-on boards or hardware

- Third-party hardware or software

- Operating system type and revision level

Compaq Website

The Compaq website has information on this product as well as the latest drivers and
Flash ROM images. You can access the Compaq website at
www.compaq.com/storage.

Compaq Authorized Reseller

For the name of your nearest Compaq authorized reseller:

- In the United States, call 1-800-345-1518.

- In Canada, call 1-800-263-5868.

- Elsewhere, see the Compaq website for locations and telephone numbers.

1

Product Overview

This chapter describes the configuration options and setup and configuration dependencies and requirements for the *StorageWorks* NAS Executor E7000.

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.

Configuration Options

The NAS E7000 can be deployed in two different configurations attached to a storage area network (SAN): as a single NAS device or as a clustered pair.

NAS E7000 as a Single Device Attached to a SAN

In the single NAS device configuration, a NAS E7000 is attached to a SAN via a pair of fibre channel host bus adapters (HBAs) and two SAN switches as illustrated in Figure 1-1. 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. The redundant path can take two forms that are known as multi-bus and transparent failover. These modes are set at the controller level and on the NAS E7000.

SAN storage is not managed by the NAS E7000 and requires coordination between the NAS administrator and the SAN administrator. LUN requests need to be made and assigned to the NAS E7000 using selective storage presentation from the SAN controller pairs. Naming of the LUNs and the connections to the NAS E7000 is important for tracking and identification purposes. At least one LUN is required for use by the NAS E7000 in order for the device to be functional. Refer to the Storage Management section later in this chapter for naming conventions.
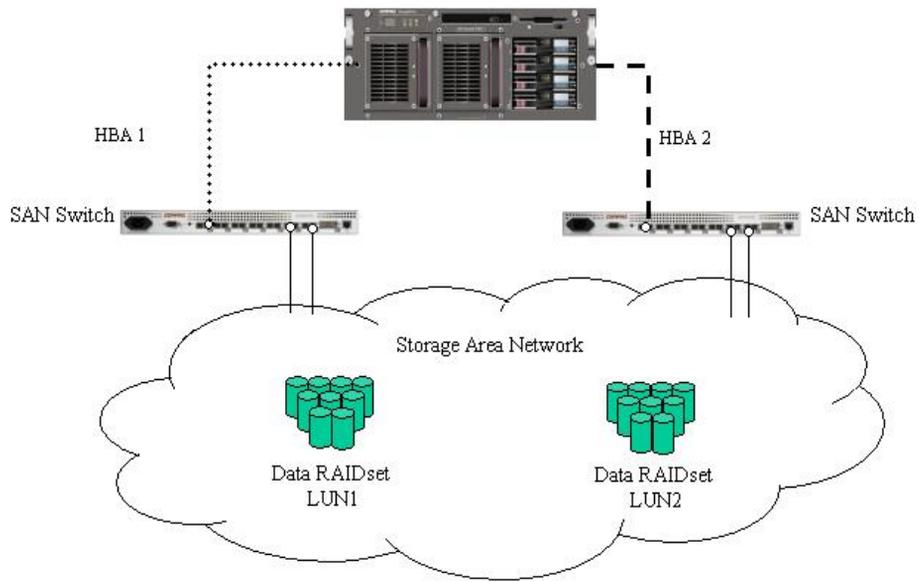
Figure 1-1: NAS E7000 as a single device

NAS E7000 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 1-2. Each NAS device is attached to the SAN via a pair of fibre channel HBAs. The same modes of operation for controller access are pertinent to the cluster deployments of the NAS E7000.

In the case of the NAS E7000, 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 directly. In the case of clustered NAS E7000 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" section.
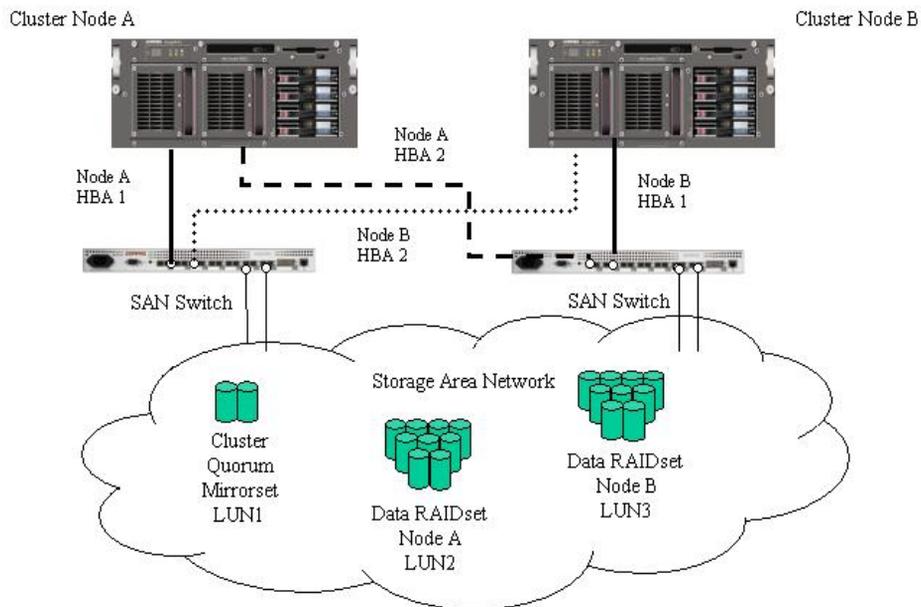
Figure 1-2: NAS E7000 as a clustered pair of devices

Connecting NAS E7000 to the Network

The NAS E7000 can be connected to the network as a single device or as a clustered pair.

NAS E7000 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 four-port network interface controller (NIC) card that provides one port for management and three 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 Remote Insight Lights-Out Edition (RILOE) board. Compaq recommends that this connection be placed on a management LAN separate from the corporate infrastructure.

The NAS E7000 supports the use of NIC teaming. NIC teaming provides failover and load balancing of network ports of the NAS E7000. NIC teaming requires the network cables to be installed on the same subnet to enable it to work. For example, in Figure 1-3 Eth1, Eth2, and Eth3 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, Compaq 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.

Remote Insight Lights-Out Board Port
Client Subnet 3 Eth3
Client Subnet 2 Eth2
Client Subnet 2 Eth1
Management Subnet 1 Eth0

HBA 1

SAN Switch

HBA 2

SAN Switch

Storage Area Network

Data RAIDset
LUN1

Data RAIDset
LUN2
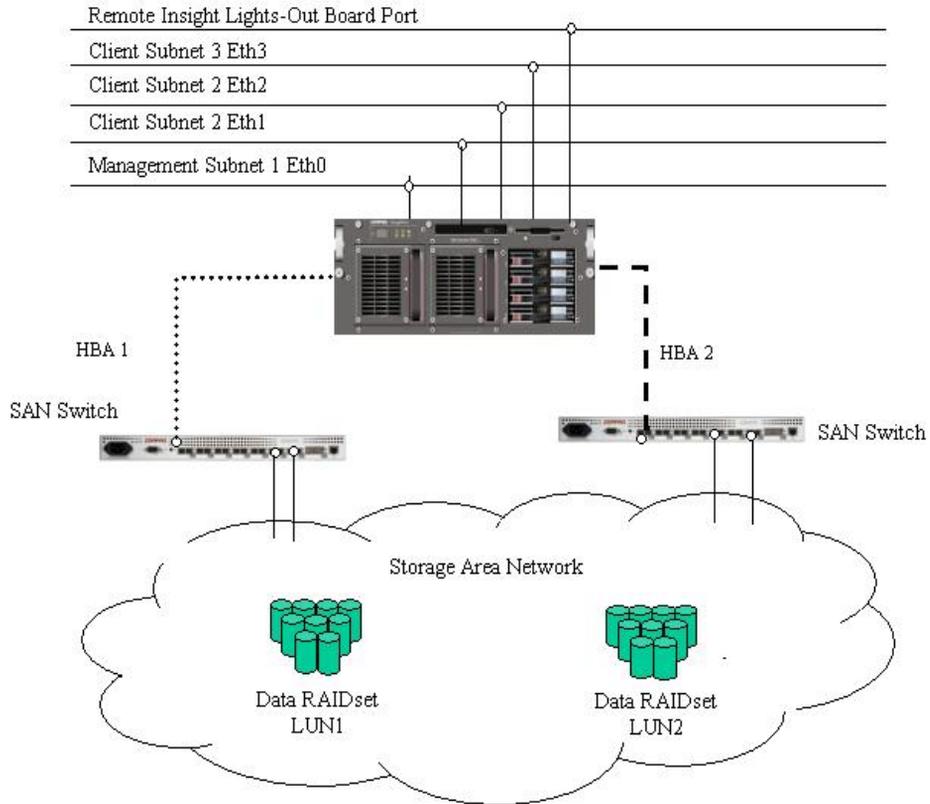
Figure 1-3: NAS E7000 single device deployment

NAS E7000 Cluster Deployment

In a clustered deployment, network connections are in divided into three categories: cluster maintenance segments, client data segments, and management segments. The default shipping configuration contains a four-port NIC card that provides one port for cluster maintenance, one port for management, and two ports for client data. An additional management port for remote console and diagnostics is provided off the RILOE board. Compaq 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 1-4 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 1-4, Eth2 from both nodes is shown on the same segment and Eth3 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 supports the use of NIC teaming in clustered configurations. All previous caveats from the NAS E7000 single node deployment on networks section still apply.
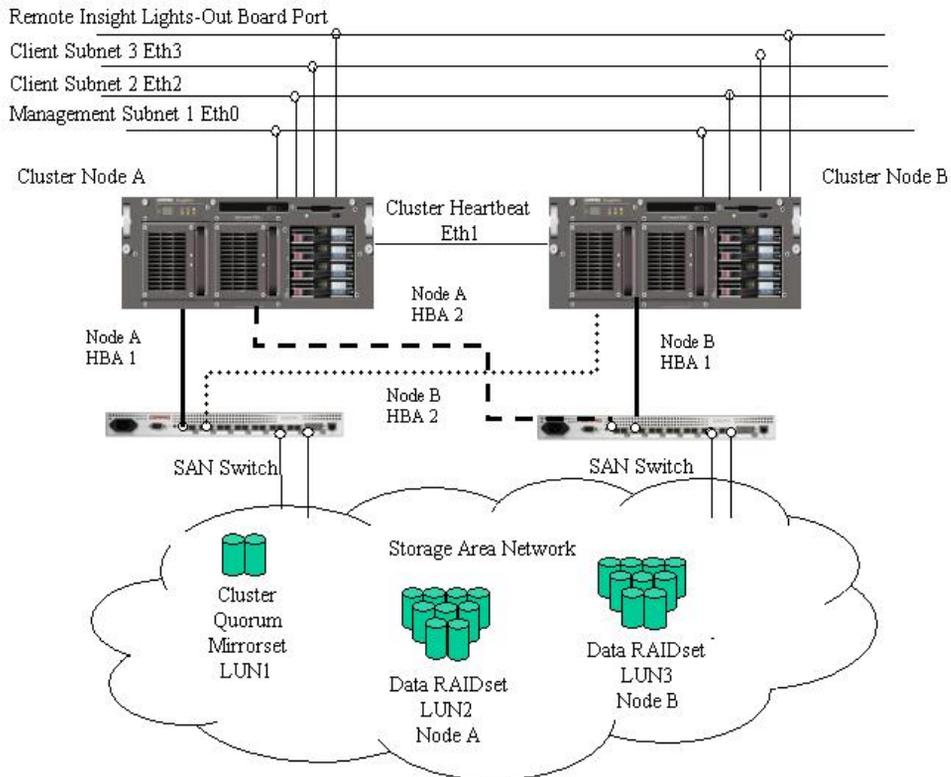
Figure 1-4: NAS E7000 cluster deployment

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 wizards within the Web UI. In either type of setup, it is important to read all of the supplied documentation prior to starting. Supplied documents include:

- Rack Installation and Connection Card

- Administration Guide

Stand Alone NAS E7000

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 2-3 from this guide.

3. Identify the firmware, storage network topology (hub vs. switch), and storage controller features in use on the SAN. Configure the NAS device to select the appropriate HBA software using the WebUI.

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 fibre 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. With the system online, the SAN administrator assigns the LUNs to the NAS device one at a time so that they can be identified easily in device manager and assigned to a Virtual Replicator (VR) pool. See the procedure in the storage management section of the administration guide.

8. Create virtual disks from the pools and format them.

9. Create shares and assign share permissions.

10. **This is an optional step**. Enable network file system (NFS) sharing, NCP, and/or AppleTalk as desired. See the administration guide for this procedure in greater detail.

11. **This is an optional step**. Create shares corresponding to the protocols mentioned in the previous steps. Grant rights to access on a per protocol basis.

12. **This is an optional step**. Create NFS maps linking Unix users to Windows user accounts to enable access permissions. See the appropriate section of the administration guide for setting up NFS shares and maps.

13. Read the remaining sections of the administration guide.

Clustered NAS E7000

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. Activate the cluster setup tool (CST) via the Web browser on one of the nodes and follow the steps in the wizard. The wizard will setup both nodes of the cluster and bring the cluster up.

   NOTE: While the wizard provides complete setup guidance for the cluster, protocol setup such as NFS is a post wizard activity.

4. **This is an optional step**. Enable NFS sharing, NCP, and/or AppleTalk as desired. See the administration guide for this procedure in detail.

5. **This is an optional step**. Create shares corresponding to the protocols mentioned in the previous steps. Grant rights to access on a per protocol basis.

6. **This is an optional step**. Create NFS maps linking Unix users to Windows user accounts to enable access permissions. See the appropriate section of the administration guide for setting up NFS shares and maps.

NOTE: Maps in a cluster are replicated across both nodes in a cluster.

7. Read the remaining sections of the administration guide, especially the cluster management section.

Dependencies and Requirements - NAS E7000 as a Single Device

The following conditions must be met in order for the NAS E7000 to operate as a single device.

Storage Object Requirements

- MA8000, MA12000, and MA16000-based storage only

- ACS firmware (families 8.5 and 8.6 only)

- SAN-based storage composed of RAID 3/5 RAIDsets

    NOTE: All RAIDsets are supported, but it is recommended that you use RAID 3/5 for the best combination of availability, performance, and space efficiency.

Storage Networking Requirements

- One open port on each of the two SAN switches that access the same controller pairs

- Two fibre channel cables

IP Networking and Setup Requirements

- A single Ethernet connection on a switch or hub for the RILOE board

    NOTE: The RILOE board connection is optional, but recommended.

- A single Ethernet connection for the management subnet of the NAS E7000

NOTE: A management subnet provides for the best security and is optional, but recommended.

- Additional Ethernet connection ports to client subnets (depending on network options ordered)

- Windows-based PC running Microsoft Internet Explorer 5.5 (or greater) on the same network segment as the NAS E7000 management port (Eth 0); This will be used to set up the NAS device

IMPORTANT: The RapidLaunch client and NAS E7000 must be on the same network segment as the management port (Eth 0) or RapidLaunch will not detect the NAS E7000.

Dependencies and Requirements - NAS E7000 Cluster

The following conditions must be met in order for the NAS E7000 to operate as a cluster.

NOTE: The following requirements are in addition to the single node requirements.

Network Participation Requirement

The NAS E7000 must be running in a Microsoft Windows NT domain or Active Directory environment. The Windows NT domain or Active Directory provides the device name abstraction and centralized communications required for clustering. The workgroup deployment lacks the features required by Microsoft Clustering Services and is not supported.

Additional IP Networking Requirements

- The environment must be able to support a separate, private network that connects only the two clustered nodes for the heartbeat connection. The heartbeat connection allows the nodes of a cluster to verify each other's state and form a cluster. This connection can be accomplished by using a crossover cable (not included with the NAS device) between the two NAS devices, by partitioning a separate virtual LAN at the switch, or by using a physically separate network via a separate switch or hub. Each node of the cluster should be placed on the same non-routed subnet for this connection.

- Compaq recommends setting up the public network as a redundant path for the heartbeat. This setup, however, leads to increased traffic on the public network.

- The remaining network segments of each node should be connected to matching subnets across both nodes.

Storage Networking Requirements

- Two additional open ports with one on each of the two SAN switches (for a total of four open ports for clustering) that have access to the same controller pair on the SAN

- Two additional fibre channel cables (for a total of four fibre channel cables)

Storage Object Minimum Requirements

- At least two LUNs (RAID 3/5 RAID), one for each cluster node for file sharing

- One dedicated mirror set LUN for the cluster quorum disk

The cluster requires shared resources that can be accessed by either node in the event of a failover. The fibre-based storage associated with a SAN provides such an environment.

> **IMPORTANT:** The **only** high-availability configuration that exists is one that uses vertical striping using only one disk from each storage enclosure in any given RAID array.

Storage Management and Virtual Replicator on a SAN

This section provides an overview of the components that make up the NAS storage structure. A complete reading of the components and their relationships may be found in the administration guide.

⚠ **CAUTION:** This section on storage management and VR on a SAN is required reading material for the NAS/SAN Administrator. This section develops the concepts and requirements that serve as the basis for successfully using a *StorageWorks* NAS device on the SAN. 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 Overview

Figure 1-5 provides an illustration of the various storage components of the NAS E7000. Storage is broken up into three major divisions:

- SAN storage elements
- Virtual Replicator elements
- File system elements

Each of these elements are composed of the previous level's elements.

SAN Storage Elements

The lowest level of storage management on the NAS E7000 occurs at the physical drive level. Physical drives are placed into the external storage enclosure or enclosures of the SAN storage network and are grouped into RAIDsets (LUNs) for fault tolerance and better performance.
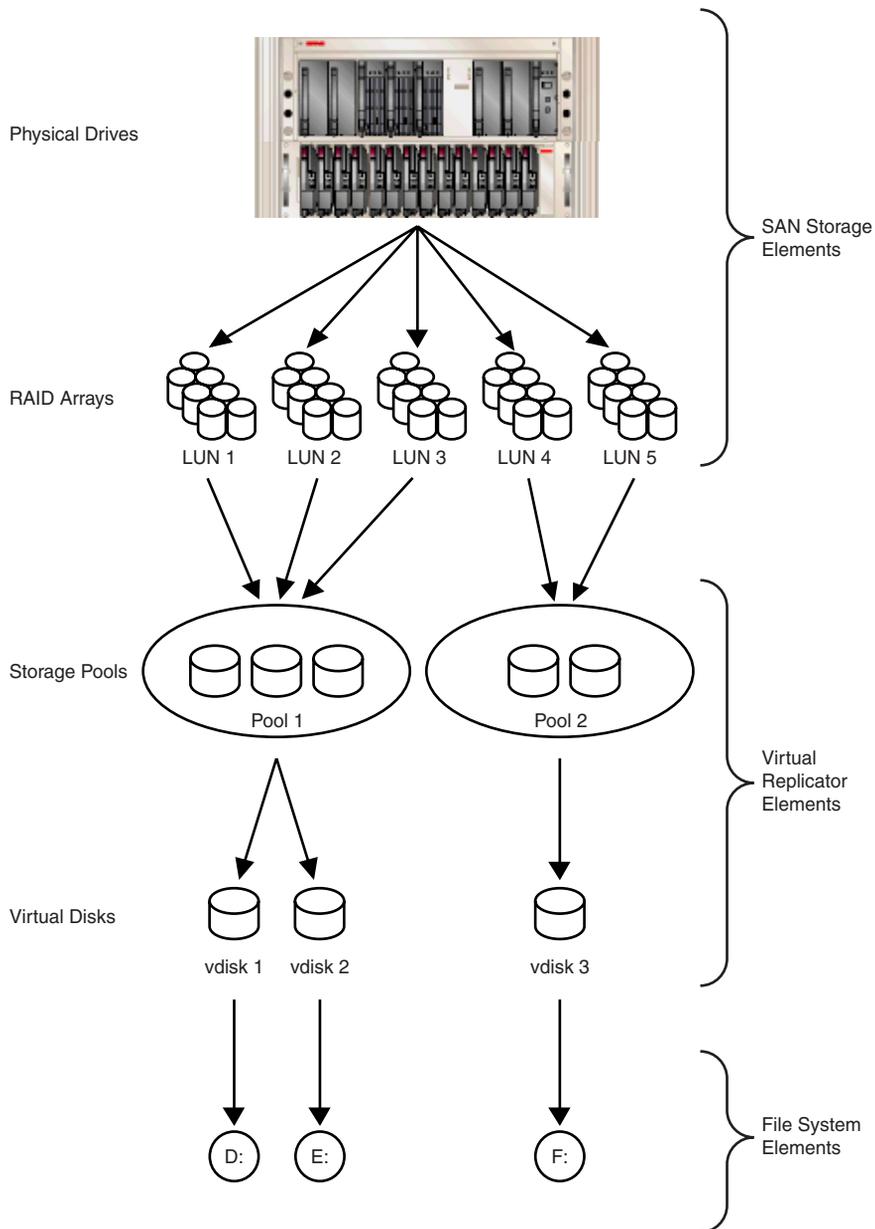
Figure 1-5: Storage management process

Virtual Replicator Elements

Virtual Replicator (VR) provides volume virtualization for the NAS device by allowing for the creation of virtual disks (basic disks in Windows 2000) from VR pools containing the LUNs managed on the SAN. VR pools are logical abstractions that aggregate the disk space from one or more LUNs into a large set of disk blocks. From the pool of blocks, VR virtual disks are created and presented to the operating system as New Technology File System (NTFS) volumes. Virtual disks can be enlarged at a later time when there is a need for more space.

When using VR, the following constraints should be reviewed:

- There is a maximum of 256 LUNs available to the connected NAS devices.

- If multiple LUNs are used to form a VR pool, they must all be from the same HSG80 controller pair.

- LVM from Windows 2000 should not be used to manage VR disks. The two management tools do not have an awareness of each other and compatibility issues can arise between the two management tools.

- VR pools can consist of a maximum of eight storage units. Thus, a pool can consist of a maximum of eight separate LUNs. Each LUN cannot exceed 1 TB in size.

- A pool may contain a maximum of 8 TB of disk space, and the maximum virtual disk size is 2 TB.

- The LUNs composing a VR pool must be treated synchronously. For example, if LUNs 8, 9, and 10 are used to compose a single VR pool and LUN 9 is restored from a backup, snapshot, or clone, the VR pool would be corrupted, resulting in complete data loss.

- There is a limit to the number of virtual disks that can be carved out of a VR pool. Currently, a maximum of eight virtual disks can be carved out of a single pool.

- Each virtual disk must be presented as a drive letter or a mount point on the NAS device for users and the operating system to be able to access the virtual disk. Although it is possible to create a virtual disk and not map it to a drive letter or mount point, neither the users nor the administrator would have access to the storage space contained within that virtual disk.

- All the units that make up a pool should have the same high-availability characteristics (RAID levels and striping methods). If one LUN member of the pool goes offline, the entire pool is unavailable.

- The current version of NAS does not support the use of CONCATSETS (concatenated sets). VR pool participants must remain the same size. VR also performs the same function as CONCATSETS, so this functionality is provided at the software level, rather than at the controller level by adding LUNs to the pool.

- With Data Replication Manager (DRM), the LUNs of a VR pool must all be treated synchronously. When using DRM, be sure to group all the LUNs of a single pool into an association set so that the LUNs are kept in sync as they are replicated to the remote or target storage subsystem.

File System Elements

The file systems are NTFS formatted with drive letter assignments from the virtual disks that are created by VR.

2

Before You Begin

This chapter describes the preinitialization tasks required for the *StorageWorks* NAS Executor E7000.

Preinitialization

Before beginning the installation process, verify that the hardware installation is complete. Verify that the NAS E7000 is completely installed in the rack and that all cables and cords are connected except for the fibre cables attached to the SAN switches. The setup utility documented here and the next section only provide basic setup of the network components of the NAS E7000.

IMPORTANT: If you need assistance with rack installation or hardware connections, refer to the Rack Installation and Connection card included in the shipping carton.

Collect Information for Initialization

Choose a host name and collect general information before initializing the NAS E7000.

Initialization 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 initialization. Become familiar with this information before attempting to initialize and configure the NAS device.

Table 2-1: Initialization Information
Part A: To be completed for DHCP and non-DHCP configurations
Server Host Name:

Remote Insight Board Name:	Remote Insight Board Default User:	Password:

SAN Configuration:
Topology: Fibre Channel-Switch or Fibre Channel-Arbitrated Loop
Controller Firmware: ACS 8.5x or ACS 8.6x
Controller Failover: Multi-bus or Transparent

continued

Table 2-1: Initialization Information *continued*

Part B: To be completed for non-DHCP configurations only		
DNS Servers	IP Address	
1		
2		
3		
NAS NIC Port*	IP Address	Subnet Mask
Eth 0		
Eth 1		
Eth 2		
Eth 3		
Remote Insight Board Eth		
* The default NAS E7000 has four Ethernet ports available for network connectivity. Do not configure ports that will not be used. Each Ethernet port must be configured with a separate subnet.		
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 C: SNMP Information (optional)		
Trap Destination (IP Address) Manager Client:		
Management Traps Community String:		
System Management Community String:		

3

Configuration Setup

This chapter provides information about initializing the *StorageWorks* NAS Executor E7000 using online or offline methods.

Before completing the tasks in this chapter, verify that the NAS E7000 is installed in the rack and that all cables and cords are connected. It is also necessary to collect certain information required during the initialization process, as mentioned in Chapter 2, "Before You Begin."

Initialization Methods

The recommended method for initializing the NAS E7000 is by using the WebUI configuration application that comes with the NAS E7000. The optional method is to create a configuration data diskette. The data diskette can then be inserted into the NAS E7000 during initial power up. Compaq recommends using a monitor to view the initialization process if the data diskette is used to configure the NAS device.

WebUI Initialization (Recommended Method)

The NAS E7000 includes a WebUI application that is designed to be a graphical, easy-to-use application that gathers the necessary information for initialization. The WebUI may be accessed through two methods: by host name or through auto discovery mode using the RapidLaunch utility.

Auto Discovery Method (Via RapidLaunch)

The NAS E7000 includes a RapidLaunch CD that can run on any Windows-based PC using Microsoft Internet Explorer 5.5 (or greater). The WebUI application is designed to be graphical and easy-to-use, and to assist you in populating information necessary for initialization.

> **NOTE:** RapidLaunch must be run on each node in a cluster.

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

- RapidLaunch CD

NOTE: The NAS E7000 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 using the WebUI configuration application:

NOTE: Use the management port (Eth 0) to connect the NAS E7000 to the network.

1. Connect the Ethernet cables to the respective network ports of the NAS E7000 and the corresponding network segments in accordance with the information in the "Initialization Information" section in Chapter 2. See Figure 3-1 and Table 3-1 for the locations of the network ports on the NAS E7000.

2. Verify that the Windows-based PC client is connected to the same subnet as the NAS E7000.

3. Power up the Windows-based PC and wait until the operating system has completely loaded.

4. Insert the RapidLaunch CD into the CD-ROM drive.

5. The RapidLaunch CD should automatically run. If the program does not startup automatically, the program may be run manually. Click **Start** select **Run** on the Windows taskbar, and then type the following:

   {CD ROM drive}:\setup.exe.

   Wait for the interface to startup.

6. Go to the NAS device and power it on. It will be several minutes before the NAS device is accessible on the network.

7. 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 3-2.
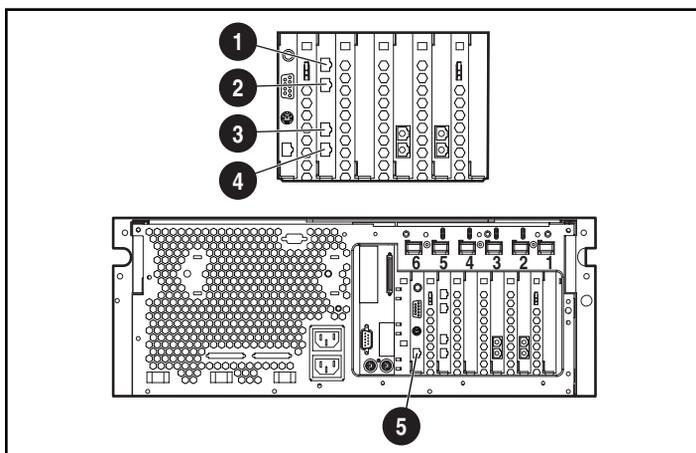
Figure 3-1: NAS E7000 Ethernet connectors

Table 3-1: Ethernet Network Connectors

Item	Description
❶	NIC Ethernet port 3 (Eth 3) used for data
❷	NIC Ethernet port 2 (Eth 2) used for data
❸	NIC Ethernet port 1 (Eth 1) used for data or cluster heartbeat
❹	NIC Ethernet port 0 (Eth 0) used for management
❺	Remote Insight Lights-Out Edition board Ethernet port (RIB Eth)

Note: Connect a loopback cable to any of the NAS E7000 Ethernet ports (Eth 0 through Eth 3) that is not configured for use. Do not connect a loopback cable to the Ethernet port on the Remote Insight Lights-Out Edition board (RIB Eth).
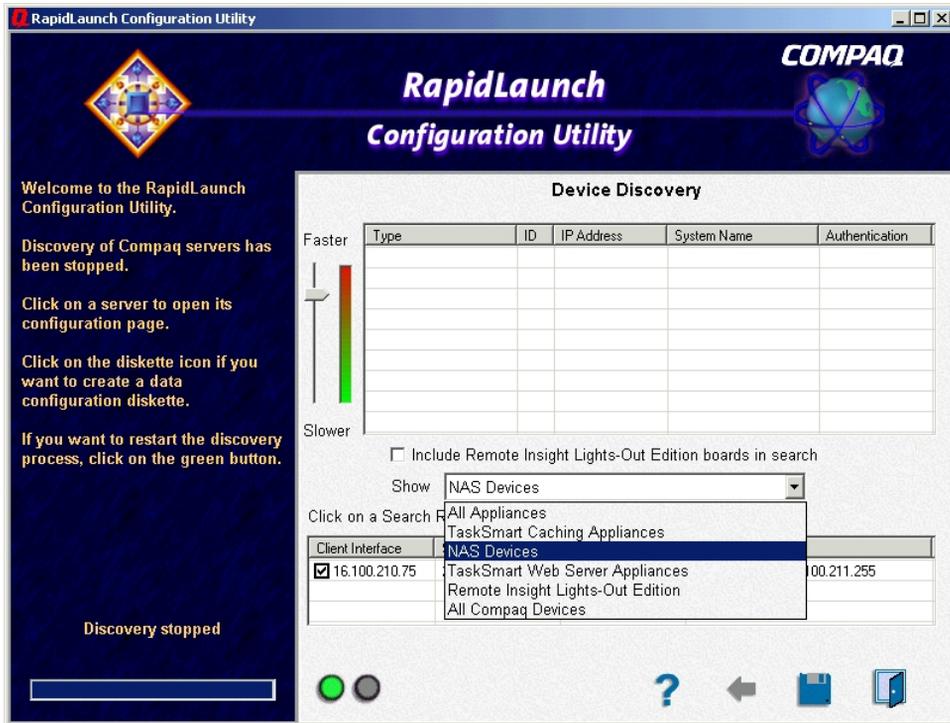
Figure 3-2: RapidLaunch search screen

8. All the NAS devices found on the network are displayed as shown in Figure 3-3. The NAS device will be displayed in the device discovery portion of the screen as an unconfigured device. It may take several minutes for the NAS device to be found on the network.

   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.
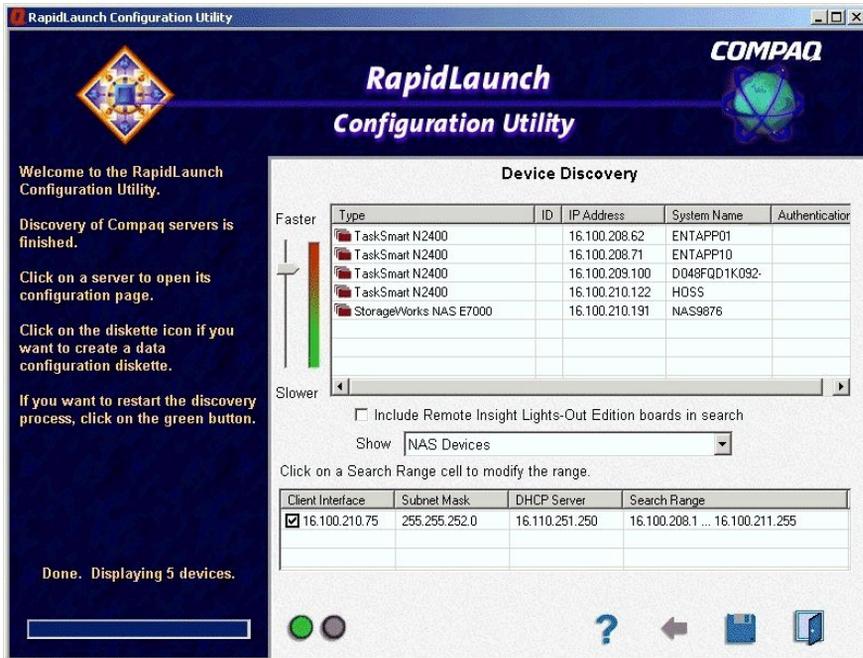
Figure 3-3: RapidLaunch device discovery screen

9. Select the unconfigured *StorageWorks* NAS device from the device list. This launches the WebUI configuration application (Rapid Startup) on the target *StorageWorks* NAS device as shown in Figure 3-4.
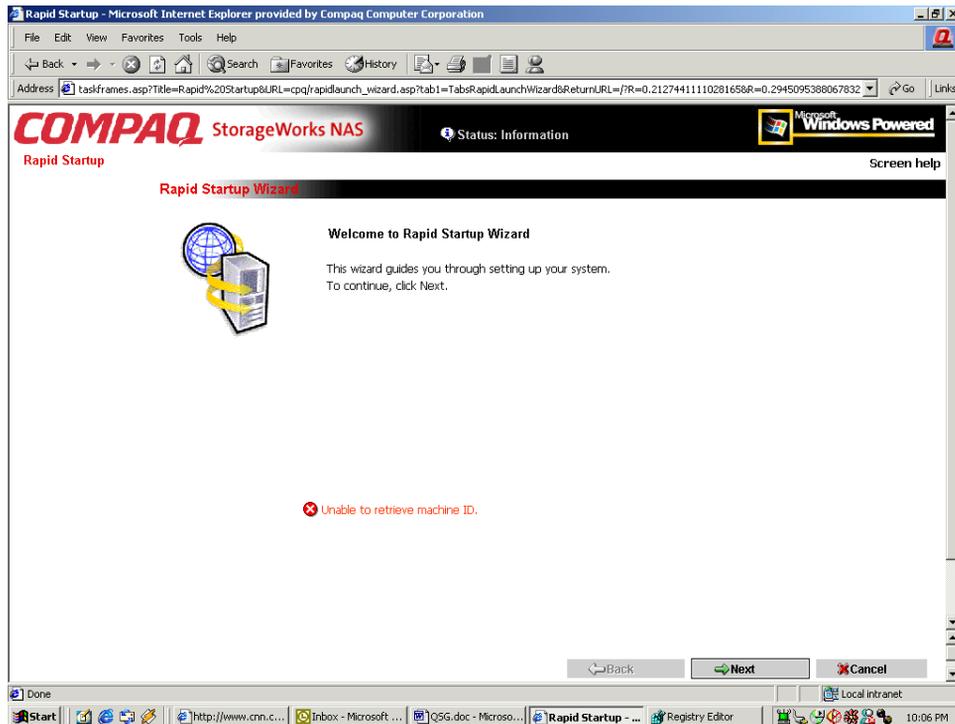
Figure 3-4: Rapid startup wizard screen

10. Follow the instructions on the screen to input the correct information. Verify that your information is correct when the configuration review screen is displayed as shown in Figure 3-5.

11. Click the **Online** icon to save the network information to the NAS E7000.
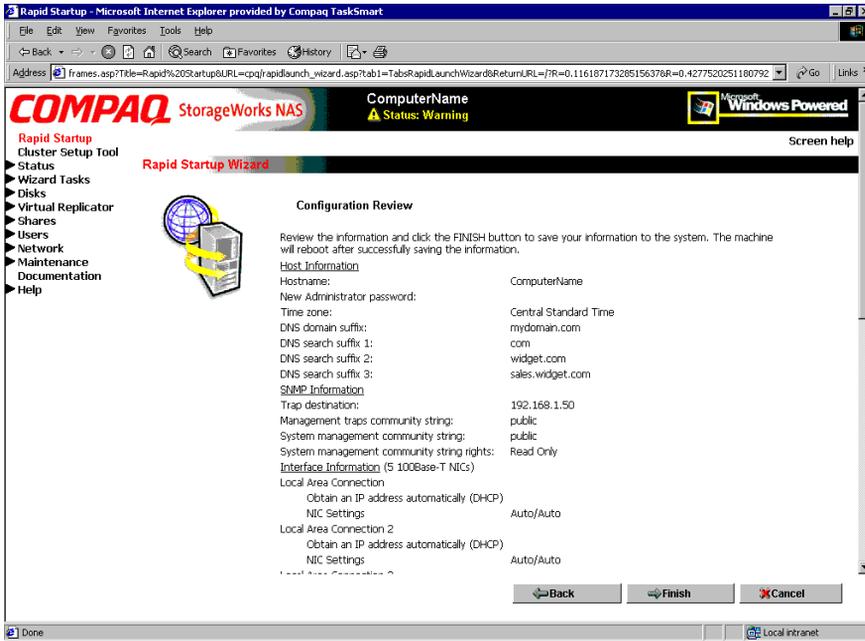
Figure 3-5: Rapid startup configuration review screen

12. Click the **Finish** icon to exit Rapid Startup. Close the browser window. The NAS E7000 will now reboot to set the configuration information.

13. If the NAS E7000 is being deployed in a cluster configuration, go back to the RapidLaunch program and select the next unconfigured NAS device to be used within the cluster and repeat steps 8-12 for the second node.

14. Exit RapidLaunch and remove the RapidLaunch CD from the CD-ROM drive and store it in a secure location.

15. **For cluster deployments only.** Once the second node has been configured with Rapid Startup, close the browser window and follow the procedures of the CST documented in Chapter 4, "Cluster Setup Tool."

Direct Access Method (Via Hostname)

The NAS E7000 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 as illustrated in Figure 3-6.

D4059ABC3433
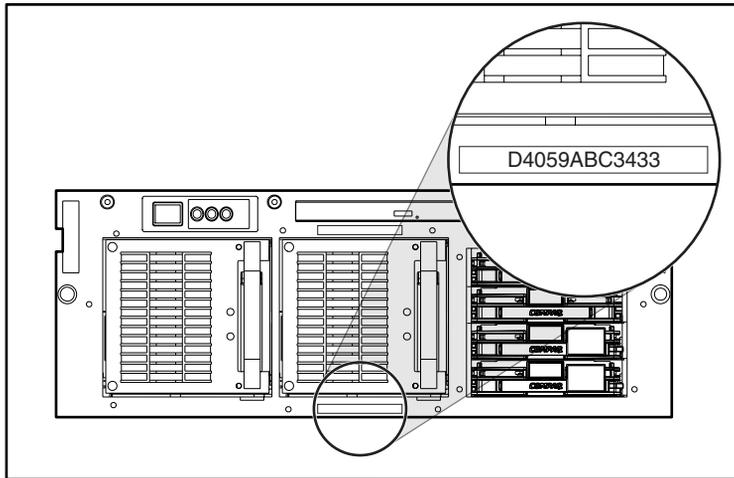
Figure 3-6: Serial number location

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

- DHCP serviced network

- Serial number of the NAS E7000

NOTE: The NAS E7000 is designed to be deployed without a monitor, keyboard, and mouse. These ports are available and supported by the NAS device if used.

Procedure

1. Connect the Ethernet cables to the respective network ports of the NAS E7000 and the corresponding network segments in accordance with the information in the "Initialization Information" section in Chapter 2. See Figure 3-1 and Table 3-1 for the locations of the network ports on the NAS E7000.

2. Open Internet Explorer on the Windows-based PC. Enter `http://`, the serial number of the NAS E7000 followed by a dash (`-`), followed by `:3201`. Press **Enter**. This launches the WebUI configuration application (Rapid Startup) on the target *StorageWorks* NAS device as shown in Figure 3-4.

   Example: http://D4059ABC3433-:3201.

3. Follow the instructions on the screen to input the correct information. Verify that your information is correct when the configuration review screen is displayed as shown in Figure 3-5.

4. Click the **Online** icon to save the network information to the NAS E7000.

5. Click the **Finish** icon to exit Rapid Startup. Close the browser window. The NAS E7000 will now reboot to set the configuration information.

6. If the NAS E7000 is being deployed in a cluster configuration, repeat steps 1-4 for the second node.

7. **For cluster deployments only.** Once the second node has been configured with Rapid Startup, close the browser window and follow the procedures of the CST documented in Chapter 4, "Cluster Setup Tool."

Data Diskette Initialization (Optional Method)

The configuration data diskette method is often used for remote deployments where network access may not be possible at the time of configuration. This method uses a wizard interface that gathers the configuration information and writes it to a diskette. The diskette is then placed in the NAS E7000 upon startup. A keyboard, monitor, and mouse will be needed for the NAS E7000 to observe the initialization process.

Requirements

The following items are required to create the configuration data diskette:

- Windows-based PC with CD-ROM and diskette drives loaded with Microsoft Internet Explorer 5.5 (or greater)

- Keyboard, monitor, and mouse for NAS E7000

- RapidLaunch CD

- Blank diskette for creating configuration data diskette

Procedure

To create the configuration data diskette:

IMPORTANT: If you are using a predetermined data diskette provided by your company, proceed to Step 14.

1. Power up the Windows-based PC and wait until the operating system has completely loaded.

2. Insert the configuration data diskette into the diskette drive of the Windows-based PC.

3. Insert the RapidLaunch CD into the CD-ROM drive of the Windows-based PC.

4. The RapidLaunch CD should automatically run. If the program does not startup automatically, the program may be run manually. Click **Start** select **Run** on the Windows taskbar, and then type the following:

   {CD ROM drive}:\setup.exe.

   Wait for the interface to startup.

5. Click the **diskette** icon to initiate the creation application.

6. Select **E7000** from the listed devices. Follow the instructions on the screen to input the correct information. Verify that your information is correct when the configuration review screen is displayed.

7. Click the **diskette** icon to save the network information to the configuration data diskette.

The Configuration File Output Results screen is displayed when the information is successfully saved to the diskette.

8. If the NAS E7000 is being deployed as a cluster, remove the data diskette from the diskette drive and label it with the hostname of the device. Click the NAS E7000 Introduction screen link in the left hand pane. This will traverse the setup program back to the introduction page of the configuration utility. Repeat steps 5-7 using a second data diskette, labeling it with the second hostname.

9. Click the **Finish** icon to exit the configuration application.

10. Remove the RapidLaunch CD from the CD-ROM drive and store it in a secure location.

11. Remove the configuration data diskette from the diskette drive.

12. Insert the configuration data diskette(s) into the NAS device(s).

13. Connect the Ethernet cables to the respective Ethernet connectors in accordance with the information in the "Initialization Information" section in Chapter 2. See Figure 3-1 and Table 3-1 for the locations of the Ethernet connectors on the NAS E7000.

14. Power up the NAS E7000. The power button on the NAS E7000 is located on the front panel of the NAS E7000.

   IMPORTANT: Verify that the power LED is green to indicate the power up sequence has been initiated on the NAS E7000.

After the system starts up, monitor the initialization process.

   NOTE: If the configuration data diskette is incomplete, is not inserted before powering up the NAS E7000, the contents of the configuration data diskette are damaged, or is inserted at the wrong time, a warning screen is displayed.

During the initialization process, the system automatically restarts once.

△ **CAUTION:** To avoid damage to the system configuration, do not interrupt the initialization process once it has begun. The initialization process takes approximately 10 minutes to complete.

After initialization is complete, remove the configuration data diskette from the diskette drive and place it in a secure location with the RapidLaunch CD.

For cluster deployments only. Once both nodes have been configured, follow the CST procedures documented in Chapter 4, "Cluster Setup Tool."

Completing the System Configuration

After the initialization 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 administration guide. These include the following:

- Changing the system date and time

- Configuring storage

- Establishing file shares and create access permissions

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

- Enabling additional protocols and the associated file shares

- NIC teaming

4
Cluster Setup Tool

This chapter describes the *StorageWorks* NAS Executor E7000 cluster setup tool (CST).

CST Prerequisites

IMPORTANT: The user must read the cluster management section in the administration guide prior to beginning the CST.

The CST is a web-based setup tool whose wizard helps you to install a *StorageWorks* NAS Executor E7000 cluster. The CST displays checklist screens that involve setting up the storage, configuring the NAS E7000, and setting up cluster services. The CST can be used onsite or from a remote location.

IMPORTANT: The procedures in Chapter 3 of this guide must be completed on both nodes before using the CST.

The following is required before using the CST:

- Server names

- Domain name for the cluster

- Cluster name

- Static IP Address for cluster use

- Domain account with administrative privileges for the cluster service (account must have the "logon as a service" privilege)

- A LUN formed as a Mirrorset on the SAN for the Quorum Disk

- Create at least two LUNs formed as RAID 3/5 RAIDsets on the SAN

- Static IP addresses and network names for virtual servers

Starting the CST

Open Internet Explorer on a Windows-based PC that has network access to the NAS device. Enter http:// and the host name of one of the NAS devices for the cluster followed by :3201. Press **Enter**. This launches the CST on the target *StorageWorks* NAS device.

Example: http://node1:3201.

CST Checklist Screens

All information from the *CST Prerequisites* section must be gathered prior to using the CST. The CST transitions between both nodes in a cluster in order to set up the nodes simultaneously.

IMPORTANT: While using the CST, you must check all of the check boxes to proceed to the next screen.

As illustrated in Figure 4-1, the following steps are displayed while using the CST:

- Configure the NAS E7000. This step gets the NAS devices ready to be clustered.

- Confirm the Quorum Disk and RAIDsets are set up. The Quorum Disk is used for communication between the two nodes, and the RAIDsets are used for storage.

- Install Microsoft Cluster Services (MSCS).

- Configure SecurePath. During configuration, the NAS E7000 is set up through the SecurePath Agent Configuration Utility.

- Uninstall and reinstall Virtual Replicator (VR). VR needs to be uninstalled and reinstalled in order to get the clustering capabilities.

- Upgrade SFU. SFU needs to be upgraded to get the clustering capabilities.

- Create file shares and test failover.

The NAS E7000 will reboot multiple times during the cluster setup process. The cluster setup process resumes at the proper point after each of the required reboots.

```
┌──────────────────┐         ┌──────────────────┐
│ Configure Servers│────────▶│ Configure Servers│
│     Node A       │         │     Node B       │
└──────────────────┘         └──────────────────┘
         │
         ▼
┌──────────────────┐
│    Disk Setup    │
└──────────────────┘
         │
         ▼
┌──────────────────┐
│ Setup Connections│
└──────────────────┘
         │
         ▼
┌──────────────────┐         ┌──────────────────┐
│ Complete Quorum  │────────▶│ Complete Quorum  │
│  Disk Config     │         │  Disk Config     │
│     Node A       │         │     Node B       │
└──────────────────┘         └──────────────────┘
         │
         ▼
┌──────────────────┐         ┌──────────────────┐
│ Install and Test │────────▶│ Install and Test │
│   MSCS Node A    │         │   MSCS Node B    │
└──────────────────┘         └──────────────────┘
         │
         ▼
┌──────────────────┐         ┌──────────────────┐
│    Configure     │────────▶│    Configure     │
│   SecurePath     │         │   SecurePath     │
│     Node A       │         │     Node B       │
└──────────────────┘         └──────────────────┘
         │
         ▼
┌──────────────────┐
│   Install VR     │
│     Node A       │
└──────────────────┘
         │
         ▼
┌──────────────────┐         ┌──────────────────┐
│   Upgrade SFU    │────────▶│   Install VR     │
│     Node A       │         │     Node B       │
└──────────────────┘         └──────────────────┘
                                      │
                                      ▼
                             ┌──────────────────┐
                             │   Upgrade SFU    │
                             │     Node B       │
                             └──────────────────┘
         ┌────────────────────────────┘
         ▼
┌──────────────────┐
│   Enable LUNS    │
└──────────────────┘
         │
         ▼
┌──────────────────┐
│ Setup and test File │
│  Share Resources │
└──────────────────┘
```

Figure 4-1: CST process flow diagram

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