StorageWorks™

RAID Arrays for Windows NT Clusters

Installation Guide

EK–SMRAF–IG. D01

Digital Equipment Corporation
Maynard, Massachusetts

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Contents

4   Using the Command Console as a Remote Application

Tables

Figures

Figures (cont.)

Revision Record

This Revision Record provides a concise publication history of this manual. It lists the manual revision levels, release dates, and reasons for the revisions.

The following revision history lists all revisions of this publication and their effective dates. The publication part number is included in the Revision Level column, with the last entry denoting the latest revision. This publication supports StorageWorks RAID Arrays for Windows NT Clusters.

Revision Level	Date	Summary of Changes
EK–SMRAF–IG. A01	July 1996	Initial Release.
EK–SMRAF–IG. B01	August 1996	Adds support for HSZ40 and updates procedure for upgrading controller firmware.
EK–SMRAF–IG. C01	February 1997	Adds support for dual controllers software upgrade RAID Array 450/HSZ50, Windows NT 4.0, HszInstal setup program and DIGITAL clusters V1.1.
EK–SMRAF–IG. D01	April 1997	Adds support for HSOF 3.1/5.1 and DECKzpsx V1.41

About This Guide

This section identifies the audience of this guide and describes the contents (chapter by chapter) and structure. In addition, this section includes a list of associated documents and the conventions used in this guide.

Use this guide in conjunction with the installation, configuration, and user's guides provided with the various components of a StorageWorks RAID Arrays for Windows NT Clusters.

This guide provides the following:
- A definition of the components required to install StorageWorks RAID Arrays for Windows NT Clusters.
- A roadmap listing the general steps and the order in which you must perform them to install StorageWorks RAID Arrays for Windows NT Clusters.
- StorageWorks RAID Arrays for Windows NT Clusters installation procedures.

Audience

This guide is intended for administrators and system integrators for Windows NT Clusters. Configuring StorageWorks RAID Arrays for Windows NT Clusters requires a general understanding of Clusters, RAID, and storage concepts.

Document Structure

This guide contains the following chapters:

Getting Started

This chapter provides a description of the pre-installation steps required to install StorageWorks RAID Arrays for Windows NT Clusters. This section also provides roadmaps for configuring when you've previously installed a RAID Array and configuring when you have not yet installed a RAID Array.

Chapter 1:   Configuring Hardware for StorageWorks RAID Arrays for Windows NT Clusters

This chapter describes the procedures for installing the host adapters into the host systems as well as methods for configuring the bus in single-controller subsystems.

**Chapter 2:   Performing Software Setups for Sharing a StorageWorks
RAID Array Subsystem in a Cluster**

This chapter describes the software setups required for sharing a StorageWorks
RAID Array Subsystem in a cluster. The procedures include: running host
adapter utilities to set SCSI IDs, installing host adapter device drivers, installing
RAID Manager Software, installing HSZDISK class drivers, running the Disk
Administrator, upgrading controller firmware, installing Windows NT Service
Pack, and installing Cluster Management Software. In addition, this chapter also
describes procedures for configuring failover groups, and changing storagesets
after you have installed a Cluster.

Chapter 3:   Preparing to Upgrade RAID Array Controller Software

This chapter provides the procedures for backing up and upgrading the RAID
Array controller software.

Chapter 4:   Using the Command Console as a Remote Application

This chapter uses the Command Console as a Remote Application for networked
RAID management. It provides the selection and installation of the Command
Console on both the PC and each of the clustered hosts.

Conventions

In this guide, references to *StorageWorks RAID Array* or *StorageWorks RAID
Array controller* refer to all of the following RAID array subsystems unless a
specific subsystem model is noted:

> HSZ20 or 310
>
> HSZ40 or 410
>
> HSZ50 or 450

This guide uses the following documentation conventions:

Table 2 Style Conventions

Style	Meaning
boldface monospace type	To be input by the user
plain monospace type	Screen text
italic type	For emphasis, manual titles,
utilities,	menus, screens,
and filenames	

Associated Documents

In addition to this guide, the following documentation is useful to the reader:

Table 1 Associated Documents

Document Title	Order Number
DIGITAL Clusters for Windows NT Configuration and Installation Guide	AA–QVUSA–TE
DIGITAL Clusters for Windows NT Administrator's Guide	AA–QVUTA–TE
Getting Started - RAID Array 310 for Windows NT - Intel	EK–SMRAA–IG
RAID Array 310 for Windows NT - Alpha	EK–SMRAE–IG
RAID Array 410 for Windows NT - Intel	EK–SMRAC–IG
RAID Array 410 for Windows NT - Alpha	EK–SMRA6–IG
RAID Array 450 for Windows NT - Intel	AA–R21ZA–TE
RAID Array 450 for Windows NT - Alpha	AA–R21VA–TE
RAID Manager for RAID Arrays 310 and 410 for Windows NT Alpha/Intel User's Guide	AA–QU63C–TE
StorageWorks RAID Array Controller HSZ40 Array Controller Operating Software HSOF Version 3.0	EK–HSZ40–RN
Configuring your StorageWorks Subsystem HSZ40 Array Controllers HSOF Version 3.0	EK–HSZ40–CG
Servicing Your StorageWorks Subsystem HSZ40 Array Controllers HSOF Version 3.0	EK–HSZ40–SV
CLI Reference Manual HSD50, HSJ50, and HSZ50 Array Controllers HSOF Version 5.0	EK–HSCLI–RM
Configuring Your StorageWorks Subsystem HSZ50 Array Controllers HSOF Version 5.0	EK–HSZ50–CG
Servicing Your StorageWorks Subsystem HSZ50 Array Controllers HSOF Version 5.0	EK–HSZ50–SV
Command Console Version 1.1 User's Guide	AA–R24LA–TE

Getting Started

This section provides an overview for preparing and installing a Windows NT Cluster with two Alpha or DIGITAL Prioris-based servers and a RAID array subsystem. Chapters 1 through 4 contain detailed information about these procedures.

NOTE

In this guide, references to *StorageWorks RAID Arrays*, *StorageWorks RAID Array*, or *StorageWorks RAID Array* controller refer to all of the following RAID array subsystems unless a specific subsystem model is noted:

HSZ20 or 310
HSZ40 or 410
HSZ50 or 450

This guide provides a roadmap of the steps required to install a StorageWorks RAID Array in a Windows NT Clusters environment. This guide describes many of the procedures required to install the StorageWorks RAID Array and also refers you to other installation guides, where appropriate, to perform procedures necessary for installing the cluster software.

Visit Our Web Site for the Latest Information

Check our web for the latest drivers , technical tips, and documentation. We can be found in the technical area of our web page, *http://www.storage.digital.com/*

Pre-installation Steps:

Before starting your installation, follow these pre-installation steps:

Configure Two Servers

- Read the DIGITAL Clusters for Windows NT Configuration and Installation Guide to understand how to install Windows NT and configure your servers in a clusters environment.
- Read the DIGITAL Clusters for Windows NT Administrator's Guide to prepare two servers for clustering.

Configure a StorageWorks RAID Array Subsystem

If you are setting up your StorageWorks RAID Array subsystem for the first time along with the cluster, use the host adapter installation procedures in this document. The host adapter installation procedures in this document contain information specific to clusters that the Getting Started StorageWorks RAID Array for Windows NT Installation Guides do not contain.

Otherwise configure a StorageWorks RAID array subsystem according to the appropriate Getting Started StorageWorks RAID Array for Windows NT Installation Guide **except the chapter entitled**, **Completing Your Configuration Setup under Windows NT.**

Perform a System Backup

Follow normal procedures to backup your systems before installing the subsystem.

Verify User-Supplied Hardware and Software (System Requirements)

A StorageWorks RAID Array for Windows NT Clusters requires the following user-supplied hardware and software:

- 2 DIGITAL Alpha or DIGITAL Prioris-based servers with an available PCI slot, Windows NT operating system installed and configured according to the DIGITAL Clusters for Windows NT Configuration and Installation Guide Chapter 2
- The associated system User's Guides
- Appropriate tools to service your computer
- A StorageWorks RAID array subsystem configured according to the appropriate Getting Started Guide for Windows NT for your subsystem
- The associated StorageWorks RAID array subsystem installation and configuration guides
- The DIGITAL Clusters for Windows NT Configuration and Installation Guide

Inventory the StorageWorks RAID Arrays with DIGITAL Clusters for Windows NT Platform Kit or Cable/Doc. Kit

You received either:

- A StorageWorks RAID Arrays for Windows NT Clusters Platform Kit for DIGITAL Prioris (SWIKT–DC)
- A StorageWorks RAID Arrays for Windows NT Clusters Platform Kit for Alpha (SWDKT–DC)
- A StorageWorks RAID Array for Windows NT Cable/Doc. Kit (SWDKT-DD)

The StorageWorks RAID Arrays for Windows NT Clusters Platform Kit provides the following components:

- One 2944W Adaptec Host Adapters (DIGITAL Prioris), or KZPSA Storage Adapter (Alpha)
- One SCSI cable with a right-angle high-density 68-pin connector on one end and a straight high-density 68-pin connector on the other (BN21K-05)
- Two Y−connecting cables (BN21W−0B)
- One Terminator (H879−AA)
- This Installation Guide
- DIGITAL Clusters for Windows NT Configuration and Installation Guide
- StorageWorks RAID Array Cluster Utilities and Drivers CD-ROM containing:
  - HzInstal-HSZDisk class driver setup program
  - HSOF (StorageWorks RAID Array firmware)
  - Command Console (SWCC)
  - Copy of this guide in .PDF file format
  - Copy of Command Console (SWCC) User's Guide in .PDF file format
  - Release Notes in .PDF file format

The StorageWorks RAID Arrays with Windows NT for Clusters Cable/Documentation Kit provides the following components:

All of the components listed for the platform kit except: a host adapter and a copy of the DIGITAL Clusters Software for Windows NT.

Major Steps for Configuring

This guide provides the roadmaps listed in Table 3 which describe the major steps to configure a StorageWorks RAID Arrays for Windows NT Clusters.

Table 3 Configuration Roadmaps

Roadmap	Purpose
Configuring when you've previously installed a StorageWorks RAID Array	Use this roadmap to configure a cluster in an existing StorageWorks RAID Array subsystem configuration.
Configuring when you have not yet installed a StorageWorks RAID Array	Use this roadmap to configure a cluster while simultaneously installing a new StorageWorks RAID Array subsystem.

Configuring When You've Previously Installed a RAID Array

This section lists the major steps and provides a checklist-type roadmap for setting up a StorageWorks RAID Array for Windows NT Clusters if you've already installed a StorageWorks RAID Array and connected it to a server. See the specified chapters for detailed procedures.

1. Determine how you want to configure the shared servers/subsystem SCSI bus interconnect before you begin setting up (Chapter 1).
2. Install the host adapter into the server that requires one. Prior to installing the host adapter, you must remove the resistor packs from the board.
3. Set up the shared servers/subsystem SCSI bus interconnect configuration that you selected (Chapter 1).
4. Designate the **existing server** as **Host A** and the **new server** as **Host B** to distinguish between them for software setup procedures that you must perform on one server or the other (Chapter 2).
5. Run the Host Adapter Configuration Utility on both servers to set host adapter SCSI IDs and (Adaptec host adapters only) to deactivate on-board termination and disable power-on reset. You must set unique SCSI IDs for the host adapters. Set Host A to SCSI ID 7 and Host B to SCSI ID 6.
6. Boot Windows NT on each of the servers.
7. Install host adapter device drivers onto the server into which you installed the new host adapter. The host adapter requires drivers to operate with your systems (Chapter 2).
8. Install the Command Console.
9. Install the HSZDISK driver on **Host A** (even though you previously loaded it) **and Host B**. The HSZDISK driver are required for the RAID subsystem to operate with your systems (Chapter 2).
10. Reboot both servers. You must reboot both servers for the HSZDISK drivers to take effect.
11. Verify the HSZDISK drivers installed correctly on both servers. Use the Event Viewer to locate an event for the HSZDISK in the event log. Clicking on the HSZDISK event displays an event detail window that indicates whether the HSZDISK drivers loaded (Chapter 2).
12. Run Disk Administrator on **Host B** to reassign C as the disk partition letter of your system disk, if desired (Chapter 2). The installation of HSZDISK drivers causes Windows NT to reassign the disk partition letters, particularly reassigning the letter C from your system disk to the first HSKDISK, Disk 0. You can use the cluster with the disk partition letters as assigned after the HSZDISK installation or you can change the drive partition letters yourself.
13. Download controller firmware, if required.

14. Install Windows NT Service Pack on Host B and on Host A as well, if not already installed. DIGITAL Cluster software requires Windows NT Service Packs for certain versions of Windows NT. Refer to the release notes to determine the supported versions of Windows NT and the specific service packs required to operate DIGITAL Clusters software with those versions of Windows NT.
15. Reboot both servers after service pack installation. If you needed to install a Windows NT Service Pack, you must reboot the servers for the service pack to take effect. (Chapter 2).
16. Install the Cluster Management Software.

This completes the overview of steps required to configure a StorageWorks RAID Array for Windows NT Clusters. Go to Chapter 1 to begin the installation.

Configuring When You have Not Yet Installed a RAID Array

This section lists the major steps and provides a checklist-type roadmap for setting up a StorageWorks RAID Array for Windows NT Clusters if you've not yet connected a StorageWorks RAID Array subsystem to a server. See the specified chapters for detailed procedures.

1. Determine how you want to configure the shared servers/subsystem SCSI bus interconnect before you begin setting up (Chapter 1).
2. Install the host adapters into the servers. Prior to installing the host adapters, you must remove the resistor packs from the boards (Chapter 1).
3. Set up the shared servers/subsystem SCSI bus interconnect configuration that you selected (Chapter 1).
4. Designate the servers as Host A and Host B to distinguish between them for software setup procedures that you must perform on one server or the other (Chapter 2).
5. Run the Host Adapter Configuration Utility on both servers to set host adapter SCSI IDs and (Adaptec host adapters only) to deactivate on-board termination and disable power-on reset. You must set unique SCSI IDs for the host adapters. Set Host A to SCSI ID 7 and Host B to SCSI ID 6 (Chapter 2).
6. Boot Windows NT on each of the servers.
7. Install host adapter device drivers on both servers. The host adapters require drivers to operate with your systems (Chapter 2).
8. Install the Command Console.
9. Install the HSZDISK driver (on both servers). The HSZDISK driver are required for the RAID subsystem to operate with your systems (Chapter 2).
10. Reboot both servers. You must reboot both servers for the HSZDISK drivers to take effect.

11. Verify that the HSZDISK drivers are installed correctly on both servers. Use the Event Viewer to locate an event for the HSZDISK in the event log. Clicking on the HSZDISK event displays an event detail window that indicates whether the HSZDISK drivers loaded (Chapter 2).

12. Run Disk Administrator on **Host A** to create partitions, assign drives, and format and label the RAID array storagesets (Chapter 2).

13. Run Disk Administrator on **Host B** so that Windows NT can poll the current device configuration and lock down the partition drive letter assignments. After Disk Administrator starts and Windows NT has polled the current device configuration, exit Disk Administrator.

14. Reboot **Host B** so that Windows NT can view the new device configuration that you created from Host A.

15. Run Disk Administrator on **Host B** to verify that it sees the new device configuration that you created from Host A.

16. Download controller firmware, if required.

17. Install Windows NT Service Pack on both servers, if necessary. DIGITAL Cluster software requires Windows NT Service Packs for certain versions of Windows NT. Refer to the DIGITAL Clusters software release notes to determine the supported versions of Windows NT and the specific service packs required to operate DIGITAL Clusters software with those versions of Windows NT.

18. Reboot both servers after service pack installation. If you needed to install a Windows NT Service Pack, you must reboot the servers for the service pack to take effect. (Chapter 2).

19. Install the Cluster Management Software.

This completes the overview of steps required to configure a StorageWorks RAID Arrays for Windows NT Clusters. Go to Chapter 1 to begin the installation.

1

Configuring Hardware for StorageWorks RAID Arrays for Windows NT Clusters

Configuring hardware for a StorageWorks RAID Arrays for Windows NT Clusters covers the hardware-related setups including special procedures for installing the adapters into the host systems and methods of configuring the bus for single-controller subsystems.

The hardware setup portion of configuring for clusters requires the following major steps:

- Determining how you want to configure the shared servers/subsystems SCSI bus interconnect

- Installing a host adapter into one or both of the host systems

- Running adapter BIOS to set unique SCSI IDs for the host adapters in both servers and (for Adaptec Host Adapters only) to deactivate on-board termination and disable power-on reset

- Connecting the cluster components through the SCSI bus

1.1 Determining How to Configure the Shared Servers/Subsystem SCSI Bus Interconnect

The various components of the cluster (the servers, the RAID array subsystem) connect through the SCSI bus. Therefore, you must determine where you plan to locate each of the cluster components on the SCSI bus as the first step in configuring. You also need to know how you plan to locate the cluster components on the SCSI bus to properly set termination on the host adapters.

The major considerations for configuring the shared servers/subsystem SCSI bus interconnect include:

- Defining the two ends of the SCSI bus by selecting where you want to situate the subsystem on the SCSI-bus. You can locate the subsystem:

  ⇒ In the middle of the SCSI bus (410/HSZ40 or 450/HSZ50 subsystems)

  ⇒ On an end of the SCSI-bus (all subsystems)

- Terminating each end of the SCSI bus.
  You must terminate a SCSI bus at each end.

Where you locate each of the cluster components on the SCSI bus with 410/HSZ40 or 450/HSZ50 subsystems matters only by your preference or any physical limitations of the components in your facility. **You must locate a 310/HSZ20 subsystem at an end of the SCSI bus.**

Figures 1−1 and 1−2 show the SCSI bus interconnect configuration available for dual controller RAID Array 410/HSZ40 and 450/HSZ50 subsystems. Figures 1−3 and 1−4 show the SCSI bus interconnect configuration available for single controller RAID Array 410/HSZ40 and 450/HSZ50 subsystems. Figure 1−5 shows the SCSI bus interconnect configuration available for a RAID Array 310/HSZ20 subsystem. View these figures, and decide which configuration you want to use. Section 1.2, *Connecting the Cluster Components through the SCSI-bus* describes how to connect and terminate the cluster components according to the configuration you select.

NOTE

Although the diagrams in Figures 1−1 through 1−4 specify the RAID Array 410 subsystem only, these diagrams apply for HSZ40 and 450/HSZ50 subsystems also.

1.2 Connecting the Cluster Components through the SCSI Bus

Figures 1−1 through 1−5 show the valid configurations for connecting cluster components.

Table 1−1 lists the cluster configurations and for what types of subsystems the configuration is valid.

Table 1–1 Cluster Configurations Available for StorageWorks RAID Array Subsystems

Cluster Configuration	Valid Subsystem for Configuration
Hosts on either end of the SCSI bus	RAID 410/HSZ40 or 450/HSZ50
A host on one end and a RAID Array subsystem on the other end of the SCSI Bus	RAID 310/HSZ20 or 410/HSZ40 or 450/HSZ50

The basic steps for connecting the cluster components in all configurations include:
1.   Connecting the cluster components with the BN21K SCSI cables.
2.   Terminating the ends of the SCSI bus.

Figure 1–1 Configuration for a dual controller 410/HSZ40 or 450/HSZ50 Subsystem in the middle of the SCSI-bus
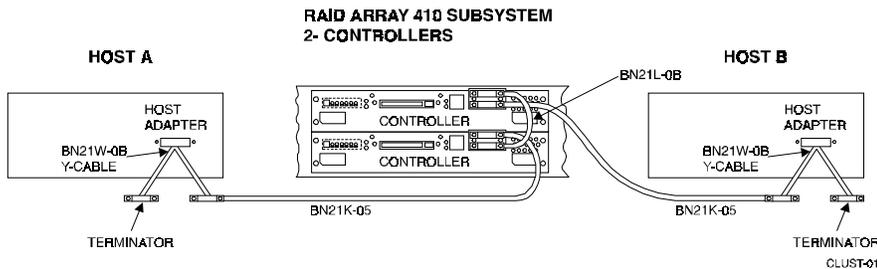
1.2.1   Connecting Hosts on Either End of the SCSI Bus (Dual Controller RAID 410/HSZ40 or 450/HSZ50 Subsystems)

To connect hosts on either end of the SCSI bus with a RAID Array 410/HSZ40 or 450/HSZ50 subsystem (Figure 1-1) follow these steps:
1.   Attach one Y−cable to the SCSI-bus connector on Host A.
2.   Attach one Y−cable to the SCSI-bus connector on Host B.
3.   Connect one end of the SCSI cable to one end of the Y–cable on Host A.
4.   Attach the other end of the SCSI cable from Host A to a tri-link connector on the subsystem controller.
5.   Connect one end of a SCSI cable to the one end of the Y–cable on Host B.
6.   Attach the other end of the SCSI cable from Host B to the available tri-link connector on the subsystem controller.
7.   Attach terminators to the available end of the Y–cable on Host A, and to the available end of the Y-cable on Host B.

**Figure 1–2 Configuration for a Dual controller 410/HSZ40 or
450/HSZ50 Subsystem at an End of the SCSI-bus**
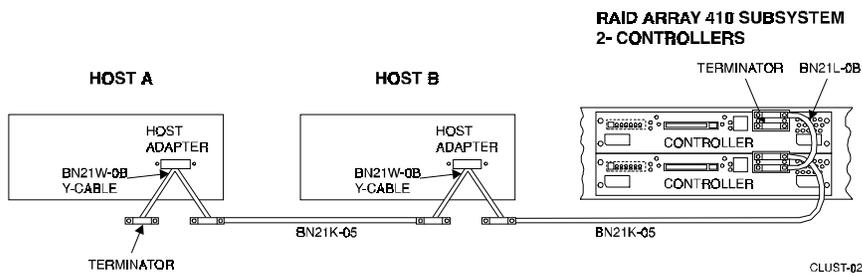
1.2.2 Connecting a Host on One End of the SCSI Bus and a Dual Controller RAID 410/HSZ40 or 450/HSZ50 Subsystem on the Other End

To connect a host on one end of the SCSI bus and the RAID array subsystem
with a two-controller subsystem on the other end of the SCSI bus, see Figure 1–2
and follow these steps:

1. Attach one Y–cable to the SCSI-bus connector on Host A.
2. Attach one Y–cable to the SCSI-bus connector on Host B.
3. Connect one end of a SCSI cable to one end of the Y–cable on Host A.
4. Attach the other end of the SCSI cable from Host A to one end of the Y–cable on Host B.
5. Connect one end of a SCSI cable to the other end of the Y–cable on Host B.
6. Attach the other end of the SCSI cable from Host B to the SCSI connector on one of the subsystem controllers.
7. Attach terminators to the available end of the Y–cable on Host A, and to the available connector on one of the subsystem controllers.

**Figure 1–3 Configuration for a Single controller 410/HSZ40 or
450/HSZ50 Subsystem in the Middle of the SCSI-bus**
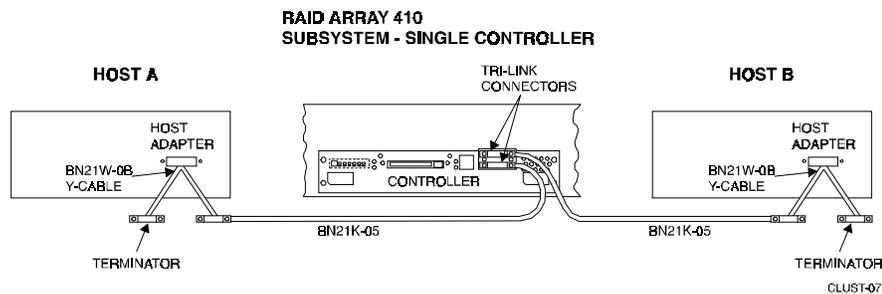
1.2.3   Connecting Hosts on Either End of the SCSI Bus (Single Controller RAID 410/HSZ40 or 450/HSZ50 Subsystems)

To connect hosts on either end of the SCSI bus with a RAID Array 410/HSZ40 or 450/HSZ50 subsystem (Figure 1-3) follow these steps:

1. Attach one Y–cable to the SCSI-bus connector on Host A.
2. Attach one Y–cable to the SCSI-bus connector on Host B.
3. Connect one end of a SCSI cable to one end of the Y–cable on Host A.
4. Attach the other end of the SCSI cable from Host A to the tri-link connector on the subsystem controller.
5. Connect one end of a SCSI cable to the one end of the Y–cable on Host B.
6. Attach the other end of the SCSI cable from Host B to the Tri-link connector on the subsystem controller.
7. Attach terminators to the available end of the Y–cable on Host A, and to the available end of the Y-cable on Host B.

**Figure 1–4 Configuration for a Single controller 410/HSZ40 or
450/HSZ50 Subsystem at an End of the SCSI-bus**
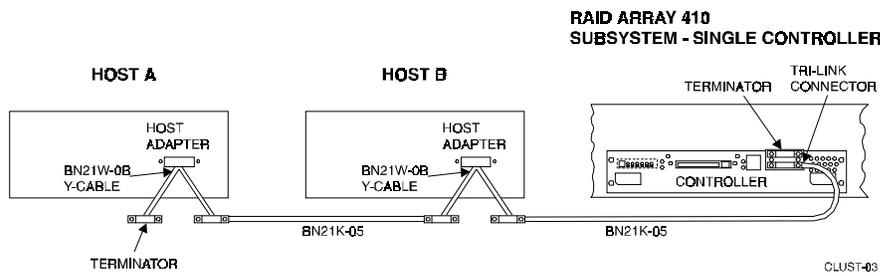
1.2.4 Connecting a Host on One End of the SCSI Bus and a Single Controller RAID Array 410/HSZ40 or 450/HSZ50 Subsystem on the Other End

To connect a host on one end of the SCSI bus and the RAID array 410/HSZ40 subsystem on the other end of the SCSI bus, see Figure 1–4 and follow these steps:

1. Attach one Y–cable to the SCSI-bus connector on Host A.
2. Attach one Y–cable to the SCSI-bus connector on Host B.
3. Connect one end of a SCSI cable to one end of the Y–cable on Host A.
4. Attach the other end of the SCSI cable from Host A to one end of the Y– cable on Host B.
5. Connect one end of a SCSI cable to the other end of the Y–cable on Host B.
6. Attach the other end of the SCSI cable from Host B to the SCSI connector on one of the subsystem controllers.
7. Attach terminators to the available end of the Y–cable on Host A, and to the available tri-link connector on the subsystem controller.

Figure 1–5 Configuration for a RAID Array 310/HSZ20 Subsystem
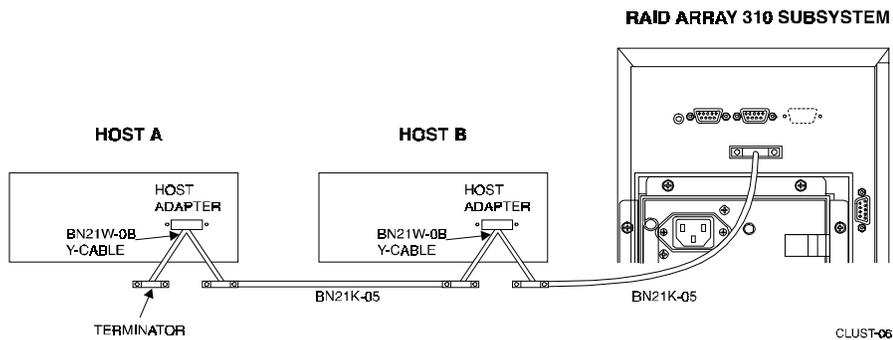
1.2.5   Connecting a Host on One End of the SCSI Bus and the RAID Array 310/HSZ20 Subsystem on the Other End

To configure for a RAID Array 310/HSZ20 subsystem, you must situate the subsystem at end of the SCSI-bus, see Figure 1−5 and follow these steps:

1.   Attach one Y−cable to the SCSI-bus connector on Host A.
2.   Attach one Y−cable to the SCSI-bus connector on Host B.
3.   Connect one end of a SCSI cable to one end of the Y–cable on Host A.
4.   Attach the other end of the SCSI cable from Host A to one end of the Y–cable on Host B.
5.   Connect one end of a SCSI cable to the other end of the Y–cable on Host B.
6.   Attach a terminator to the remaining end of the Y-cable on Host A.
7.   Attach the other end of the SCSI cable to the SCSI connector on the back of the RAID Array 310 subsystem. You do not need to add a terminator to the RAID Array 310/HSZ20 to terminate the end of the SCSI-bus, because the RAID Array 310/HSZ20 subsystem provides end of the bus termination internally.

1.3   Installing Host Adapters and Removing Resistor Packs/Networks

This section describes how to install:

- An Adaptec Host Adapter into a DIGITAL Prioris server

- A KZPSA PCI to SCSI Storage Adapter into an Alpha-based server

In addition, use this section to remove the resistor packs/networks from a host adapter you previously installed. You must remove the resistor packs/networks from all host adapters used in the cluster to deactivate on-board termination.

Figure 1–6 Resistor Pack Locations on an Adaptec Host Adapter
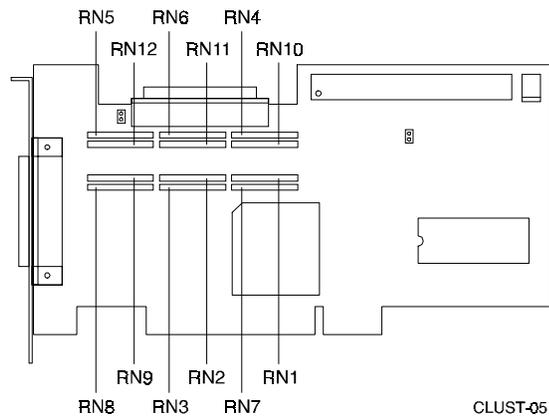
1.3.1 Installing an Adaptec Host Adapter

To install an Adaptec 2944W host adapter into a DIGITAL Prioris host server, follow these steps (this procedure includes the removal of resistor networks):

1. Turn off power to the server and disconnect the power cord.
2. Consult the server documentation to remove the cover of the server case.
3. Remove the host adapter from the antistatic bag. (If you need to put the host adapter down, place it on top of the bag.)
4. Use Figure 1–6 to locate the resistor networks on an Adaptec Host Adapter.
5. Gently pull the resistors RN1 − RN12 from the board.
6. Remove the cover of an empty 5-volt PCI bus mastering slot.

Figure 1−7 Installing an Adaptec Host Adapter
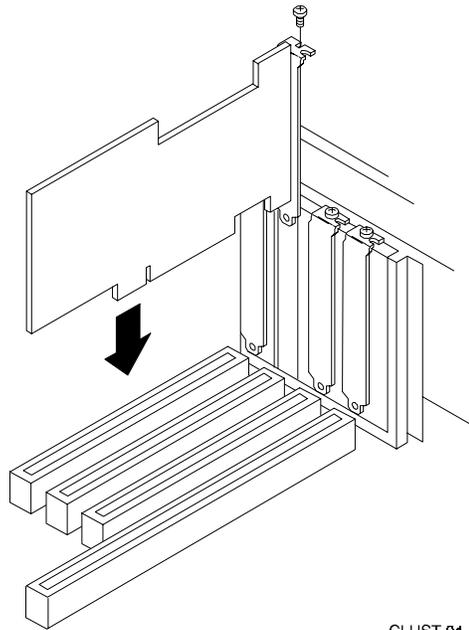
CLUST-04

7. Insert the host adapter into the slot as shown in Figure 1−7.
8. Press down on the host adapter firmly, so the contacts are securely seated in the slot.
9. Tighten the host adapter against the server frame with the screw shown in Figure 1−7.

Repeat Steps 1 through 9 to install a host adapter in a second host system, if necessary.

Figure 1–8 Resistor Locations on the KZPSA Host Adapter
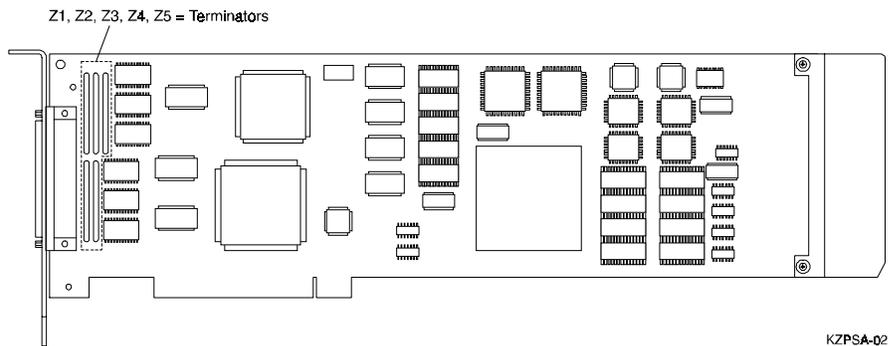
1.3.2 Installing a KZPSA Host Adapter

To install an KZPSA host adapter into an Alpha-based host server, follow these steps (this procedure includes the removal of resistor packs):

1.   Turn off power to the server and disconnect the power cord.
2.   Consult the server documentation to remove the cover of the server case.
3.   Use Figure 1−8 to locate the resistor packs on a KZPSA Host Adapter.
4.   Gently pull resistors Z1 – Z5 from the board.

Figure 1–9 Typical KZPSA Installations

With factory-installed metal extender guide.
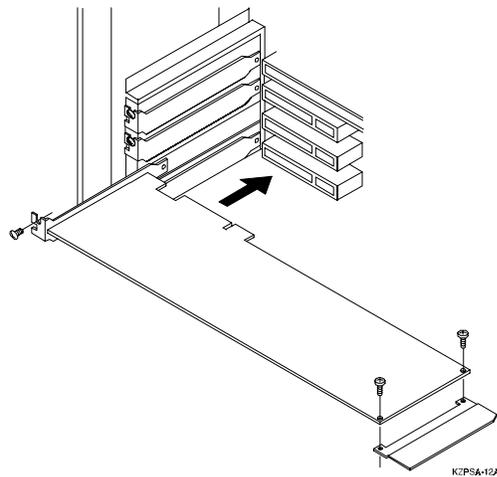
With alternate metal extender guide.
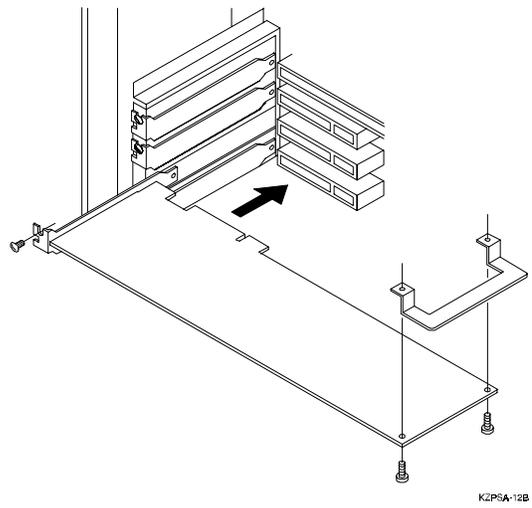
With alternate plastic extender guide.
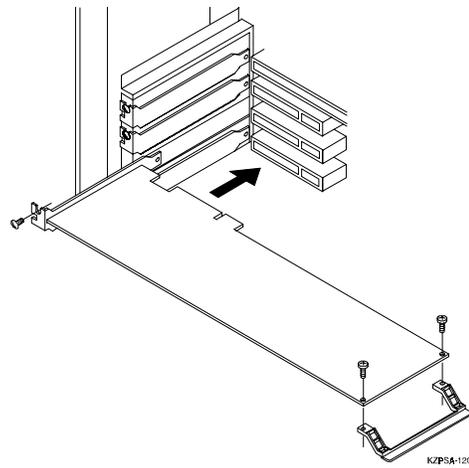
5. The KZPSA comes with a factory-installed board extender and two additional board extenders in the KZPSA kit. If the KZPSA host adapter does not fit into your host system slot with the factory-installed board extender, replace it with one of the other board extenders as shown in Figure 1–9.
6. Install the KZPSA adapter board in your host computer; the board connector is held in place with a screw you remove from a blank panel as shown in Figure 1–9.
7. Replace the cover of the server case.
8. Power on the server for the host firmware to recognize and configure the KZPSA adapter.

2

Performing Software Setups for Sharing a StorageWorks RAID Array in a Cluster

Performing software setups for sharing a RAID Array subsystem in a cluster involves a variety of software related procedures such as installing the Service Pack update to Windows NT, installing HSZDISK drivers, creating partitions, and installing the Cluster Management Software.

The software setups for StorageWorks RAID Arrays for Windows NT Clusters include the following major procedures:

- Designating servers as Host A and Host B
- Running host adapter configuration utilities, on both servers, to set host adapter SCSI IDs
- Booting Windows NT
- Installing the host adapter device drivers
- Installing StorageWorks Command Console
- Installing HSZDISK class driver
- Rebooting the servers
- Verifying the HSZDISK class driver installation
- Creating partitions and/or reassigning disk partition letters
- Downloading controller firmware
- Installing Windows NT Service Pack, if necessary
- Rebooting the servers
- Installing the Cluster Management Software

2.1 Designating Servers as Host A and Host B

You must perform many of the software setup procedures specified in this chapter twice, once on each server. This chapter specifies which procedures you need to perform on one, the other, or both servers. This chapter distinguishes between the two servers by referring to them as Host A and Host B. Therefore, prior to beginning the software setups, designate one of the servers as Host A and one as Host B as specified in Sections 2.1.1 for new and 2.1.2 for existing RAID array configurations.

2.1.1 New RAID Array Configuration

If you are configuring a cluster with a new RAID array subsystem, it does not matter which server you assign as which host; designate one as Host A and one as Host B. However, once you begin the software setups, you must consistently perform the procedures for Host A on the specific server you designated as Host A and the procedures for Host B on the specific server you designated as Host B.

2.1.2 Existing RAID Array Configuration

If you are configuring with a previously installed RAID Array, designate the **existing** or **server currently connected to the RAID Array** as **Host A** and the **new server** as **Host B**.

2.2 Running the Host Adapter Utility

Run the Adaptec or KZPSA host adapter utility to set unique SCSI IDs for the newly installed host adapters and to disable the power-on reset.

In addition, you will need to use the Adaptec host adapter utility to deactivate Adaptec Host Adapters on-board termination.

Section 2.2.1 describes how to run the SCSI*Select* Utility for an Adaptec host adapter. Section 2.2.2 describes how to run the KZPSA Host adapter Utility for a KZPSA storage adapter.

2.2.1 Running the Adaptec Host Adapter Utility

Use the Adaptec host adapter utility, SCSI*Select* Utility, to set unique SCSI IDs for the host adapters, to deactivate on-board termination and to disable the power-on reset. You must run the SCSI*Select* Utility on both servers.

Perform the procedures specified in sections 2.2.1.1 to 2.2.1.3 on Host A first and then on Host B.

2.2.1.1   Setting Adaptec Host Adapter SCSI IDs
(Host A to 7) and (Host B to 6)

To set the SCSI ID for an Adaptec host adapter, follow these steps:

> **NOTE**
>
> The following special condition applies to invoking the SCSI*Select* Utility if your server contains more than one Adaptec Host Adapter as described in Step 1:
>
> If your server contains more than one Adaptec Host Adapter, you must invoke the SCSI*Select* Utility immediately after viewing the Adaptec BIOS message, which indicates that the host adapter has started, for the host adapter you want to configure.

1. Turn on the power to **Host A**. As the BIOS is loading, you will see the message, "*Adaptec AHA-2944W BIOS V1.16, Press <Cntrl> <A> for SCSI Select ™ Utility.*" The SCSI *Select* Utility option menu should now appear.

2. Highlight the *Configure/View Host Adapter Settings* option and press the Enter key to select. The Configuration menu appears.

3. The *Host Adapter SCSI ID* option appears highlighted. Press the Enter key and a list of SCSI IDs appears.

4. For Host A, highlight **7** and press the Enter key. For Host B, highlight **6** and press the Enter key.

2.2.1.2 Deactivating On-Board Termination through the BIOS

To deactivate on-board termination with the SCSI *Select* Utility, follow these steps:

1. Highlight the *Host Adapter SCSI Termination* option and press the Enter key. A list of termination settings appears.

2. Highlight *Low Off/High Off* and press the Enter key.

3. Go on to section 2.2.1.3.

2.2.1.3 Disabling Power-On Reset

To disable power-on reset, follow these steps:

1. Highlight *Advanced Configuration Options* from the SCSI *Select* Utility Configuration menu and press the Enter key. The Advanced configuration menu appears.

2. Highlight the *Reset SCSI Bus at IC Initialization* option. Press the Enter key. A list of reset options appears.

3. Highlight *Disabled* and press the Enter key.

4. Press the Esc key to return to the Configuration menu.

5. Press the Esc key again and save the changes that you made when prompted.

6. Press the Esc key to exit the SCSI *Select* Utility on **Host B**. After you perform these procedures on both **Host A** and **Host B**, then go on to Section 2.3.

2.2.2 Setting KZPSA Host Adapter SCSI IDs for Hosts A (7) and B (6) and Disabling the Power-On Reset

Use the KZPSA Host Adapter Utility to set unique SCSI IDs for the host adapters and to disable the power-on reset.

Perform the following procedure on **Host A** first, then on **Host B**.

To set the host adapter SCSI ID and disable power-on reset, follow these steps:

1. Power up **Host A**. Press F2 to get to the BIOS setup menu. A message should appear on your display terminal, similar to the following:

NOTE

If this menu does not appear, refer to your system documentation for more information about initially setting up your Alpha to run from the ARC console. Return to this procedure when you have the Boot Menu displayed.

```
┌─────────────────────────────────────────────────┐
│             Alpha BIOS Setup Menu                │
├─────────────────────────────────────────────────┤
│          Display System Configuration            │
│             Upgrade Alpha BIOS                    │
│               Hard Disk Setup                     │
│                 CMOS Setup                         │
│                                                   │
│              Install Windows NT                   │
│                  Utilities                        │
│               About Alpha BIOS                    │
└─────────────────────────────────────────────────┘
```
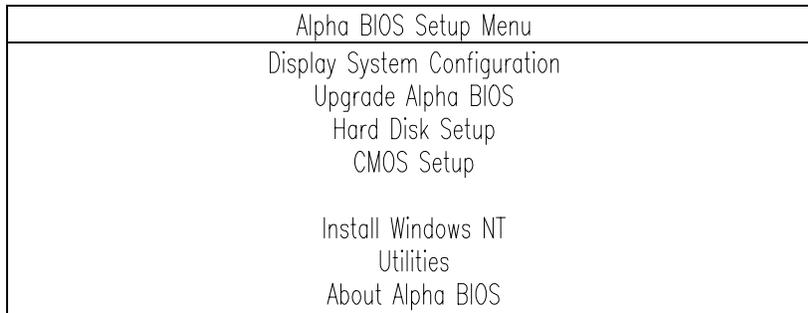
NOTE

Refer to the *Release Notes* for the minimum revision levels of the ARC firmware.

2. Insert the KZPSA utilities diskette into the floppy drive.

3. Select *Utilities* and then "Run Maintenance Program".

4. At the Program to run prompt, type: **a:\cnfgdiag.exe** and press the Enter key. The initial screen appears, similar to the one shown in Figure 2–1.

Figure 2–1 KZPSA Host Adapter Utility Initial Screen
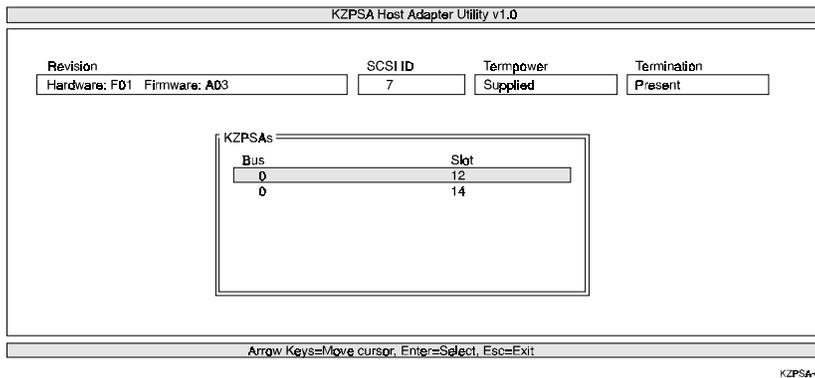
5. Use the arrow keys to select the KZPSA you want to configure and press the Enter key. The Options Window appears similar to the one shown in Figure 2–2.

Figure 2–2 Options Menu
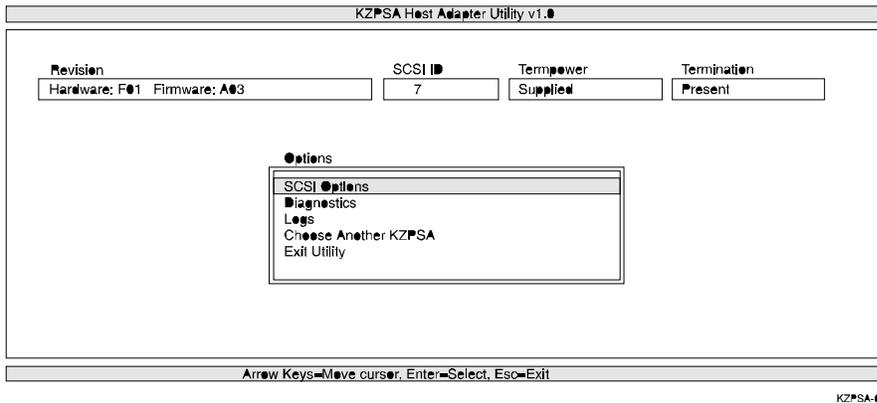
6. Select SCSI options and press the Enter Key. The SCSI Options menu appears similar to the screen shown in Figure 2–3.

Figure 2–3 SCSI Options Menu
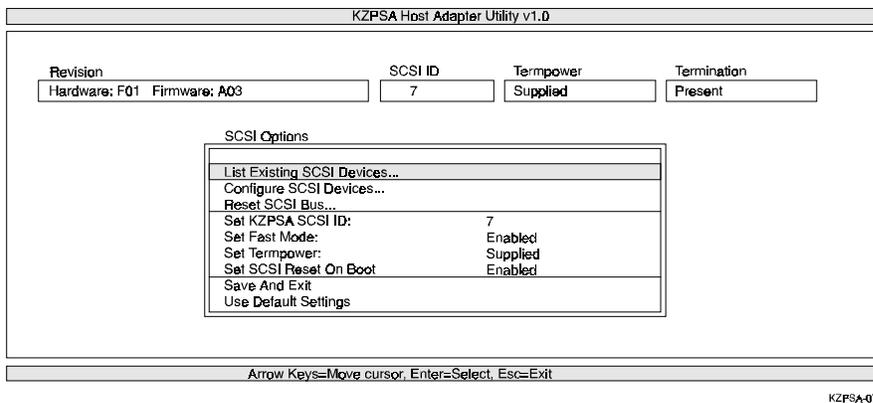
7. Highlight *Set KZPSA SCSI ID* and use the spacebar to select SCSI ID **7** for **Host A**.

8. Highlight *Set SCSI Reset on Boot* and select Disabled.

9. Highlight *Save and Exit* and press the Enter key to save your changes and exit the utility.

10. Repeat steps 1–9 for **Host B**. Select SCSI **6** for **Host B**.

When you complete this procedure for both hosts, go on to Section 2.3.

2.3 Booting Windows NT

Boot Windows NT on both servers if it did not already boot when you exited the host adapter utility.

2.4 Installing Host Adapter Device Drivers

Install host adapter device drivers onto any server into which you installed a new host adapter.

This section describes how to install:

- Adaptec host adapter device drivers into a DIGITAL Prioris server (Section 2.4.1)

- KZPSA PCI to SCSI Storage Adapter device drivers into an Alpha-based server (Section 2.4.2)

2.4.1 Installing Adaptec Host Adapter Device Drivers

To install Adaptec host adapter device drivers, follow these steps (the Adaptec Windows NT diskette contains the appropriate drivers):

1. Log into the Windows NT system with *Administrator* privileges.

2. For Windows NT 4.0, go to the *Control Panel*. Click on the **SCSI Adapter** icon. Select the **Drivers** screen.

3. For Windows NT 3.51, click on the Windows NT Setup from the Main group. Select **Add/Remove** SCSI Adapters under the *Options* menu.

4. Click on the **Add** button in the dialog box to add the correct driver.

5. A warning message is displayed; click on the **OK** button in the Confirm box.

6. From the list of adapters on the display, scroll to the end of the list, and select **Other**. You may have to click on the list to reveal all of the options including the "Other" option. The Insert Disk window appears.

7. Insert the Adaptec Family Manager set diskette for Windows NT, which came with the adapter in your platform kit, into your system's floppy drive.

8. Type, for example: **A:\winnt\3_5** and Click OK. Windows NT Setup momentarily displays a window and then displays the Select OEM Option window.

9. Click OK to select the driver entry displayed in the Select OEM Option window. The Select SCSI Adapter Option window appears.

10. Click Install to add the selected driver displayed in the Select SCSI Adapter Option window. The SCSI Adapter Setup Window appears.

11. Click Close to close the SCSI Adapter Setup Window.

12. Restart the server for the new driver to take effect.

13. Repeat steps 1−13 on a second server, if necessary.

2.4.2 Installing KZPSA Storage Adapter Device Drivers

To install KZPSA host adapter device drivers, follow these steps:

1. Log into the Windows NT system with *Administrator* privileges.

2. For Windows NT 4.0, go to the *Control Panel*. Click on the **SCSI Adapter** icon. Select the **Drivers** screen.

3. For Windows NT 3.51, click on the Windows NT Setup from the Main group. Select **Add/Remove** SCSI Adapters under the *Options* menu.

4. Click on the **Add** button in the dialog box to add the correct driver.

5. A warning message is displayed; click on the **OK** button in the Confirm box.

6. From the list of adapters on the display, scroll to the end of the list, and select **Other**. You may have to click on the list to reveal all of the options including the "Other" option.

7. Insert the diskette labeled *KZPSA Alpha AXP Software* into the floppy drive. The prompt "**a:**" is displayed for the default drive.

8. Click on **OK** at the prompt.

9. The screen displays `DIGITAL KZPSA PCI to SCSI ADAPTER`. Click on **OK**.

10. The Select Adapter Option box displays the name of the adapter, `DIGITAL KZPSA PCI to SCSI ADAPTER`. Click on the **Install** button.

11. The Windows NT Setup dialog box displays the path information from Step 8 above. Click on the **Continue** button to copy the driver to Windows NT.

12. When the operation is completed, click on the **Close** button.

13. Close the window (Alt-F14 keystroke) to leave the Windows NT Setup function and remove the diskette from the drive.

14. Restart the server for the new driver to take effect.

15. Repeats steps 1−14 on a second server, if necessary.

2.5 Using StorageWorks Command Console with Windows NT Clusters

The StorageWorks Command Console (Command Console) allows you to configure and manage your RAID Array subsystem in the Windows NT Clusters environment.

You can configure Command Console to operate on a remote management station over the network, and/or through a direct serial connection between the subsystem and a host.

Running Command Console on a remote management station requires Command Console agent software on each of the cluster servers. The agent software enables communications between the remote management client and the RAID Array subsystem. The agent uses the TCP/IP transport to communicate with the remote management client and a communications LUN storageset to communicate with the RAID Array subsystem over the SCSI bus.

Typically, you can use any RAID Array storageset as a communications LUN storageset. However, in the cluster environment you must configure your cluster failover groups so that each cluster host is primary server for the RAID Array drive you selected as the communications LUN storageset. This RAID Array-based drive will act as the communications LUN storageset for the agent on that particular server. If host failover occurs, remote RAID Array management is maintained through the other server's communications LUN storageset.

Running Command Console in direct serial mode, requires a serial cable connection between the management host's COM port and the RAID Array subsystem.

2.5.1 Selecting a Command Console Set-up

For ongoing configuration and maintenance of your clustered RAID Array subsystem, set up Command Console using one of the following specified configurations. In addition, after reading about the various configuration options, read the sections on *Installing Command Console with a New RAID Array* and *Installing Command Console with an Existing RAID Array*, to determine which configuration options are most appropriate for your situation.

2.5.1.1 Direct Serial Connection

This option configures Command Console to communicate with the RAID subsystem through use of a direct serial connection. Connect a serial line between the COM port or a local Windows 95 or NT PC on which you installed Command Console and the RAID Array. This is the simplest method of configuring Command Console. This method does not permit remote management over the network.

2.5.1.3 Direct Serial Connection and Remote Management

This option configures a direct/serial connection in addition to a remote management station. You must connect a serial line between the COM port of the cluster or a local Windows 95 or NT PC on which you install Command Console, and the RAID Array. You must also install Command Console agent software on each of the cluster servers and the Command Console client software (GUI) on the remote management station(s). In addition, you must install and configure the TCP/IP protocol on both servers and on the remote monitoring station.

This is the preferred option, because it permits RAID Array configuration and monitoring to be performed locally, even if the network or SCSI channel is not available, or through use of a remote management station during normal operation.

2.5.1.4 Installing Command Console with a New RAID Array

If you are installing a new RAID Array and wish to use Command Console with a remote management station, you still must set up to use the direct/serial mode initially in order to create at least two storage sets. These two storage sets will be used as the communications LUN storagesets. The communications LUN storagesets, along with agent software, will be used to establish a communication path through the SCSI bus for Command Console remote management.

2.5.1.5 Installing Command Console with an Existing RAID Array

If you have an existing RAID Array subsystem (previously configured) you may not have to use Command Console in the direct/serial mode. If at least two storagesets have already been configured on the RAID Array these may be used as communications LUN storagesets, as long as one can be assigned to a primary failover group on each server.

See the *Command Console Version 1.1 User's Guide* for more information about the Command Console and the *Getting Started - StorageWorks RAID Array for Windows NT Installation Guide* for more information about the communications LUN storageset.

If you are installing for the first time, start at Section 2.5.3.

If you are upgrading from RAID Manager V1.2 to the Command Console (SWCC) GUI, complete Sections 2.5.2 to 2.5.4. Then follow Sections 2.5.5 on to complete your cluster installation.

2.5.2 Uninstalling RAID Manager V1.2

To upgrade from RAID Manager V1.2 to the SWCC Command Console, you must first delete RAID Manager V1.2 from each host in the cluster on which it was installed.

To uninstall RAID Manager V1.2, follow these steps:

1. Delete the program group for *RAID Manager* from the *Program Manager* window.

2. Open *File Manager* or *Explorer*.

3. Locate *RAID Manager* directory.

4. Delete all files from the RAID Manager directory and the RAID Manager directory.

2.5.3 Installing the Command Console

Command Console installs from the *StorageWorks RAID Array Cluster Utilities and Driver* distribution CD–ROM using a standard Windows installation routine. If you are installing a StorageWorks RAID Array for Windows NT Clusters for the first time, you must establish a serial connection from a PC com port to the serial port of the RAID Array controller prior to installing the Command Console. See the appropriate *Getting Started−StorageWorks RAID Array for Windows NT Installation Guide* for more information on establishing a serial connection.

To install Command Console:

1. Place the CD in the CD-ROM drive.

2. Open the *File* menu in the Program Manager for Windows NT 3.51 or the *Start* button for Windows NT 4.0.

3. Select the RUN option.

4. In the text box, type *drive_letter:*\SWCC\CLIENT\INSTALL and click OK.

5. Follow the instructions in the setup program to complete the installation.

2.5.4 Launching Command Console

Launch the Direct Version (serial port communications) of Command Console by typing:

"**drive_letter:\path\swcc.exe"** direct

in the *RUN* dialog command-line box and pressing Enter. Command Console displays the Control Panel (Figure 2–4).

Figure 2-4 Command Console's Control Panel
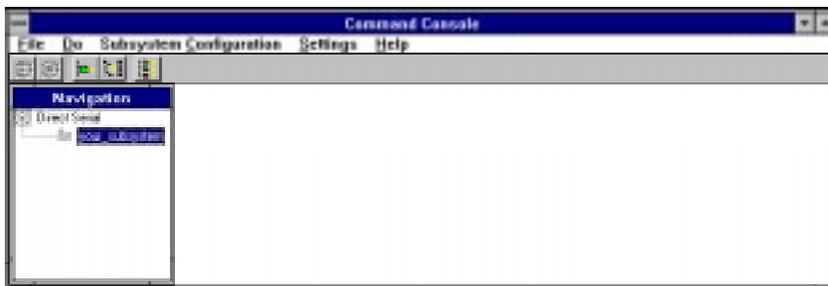
2.5.5 Establishing Communications with the RAID Array

Launch the Local Version of Command Console.

Select the **Settings│Controller Communications│Serial Command** to display the dialog box shown in Figure 2–5.

Figure 2–5 Connect Local Dialog Box (for Serial Connection)
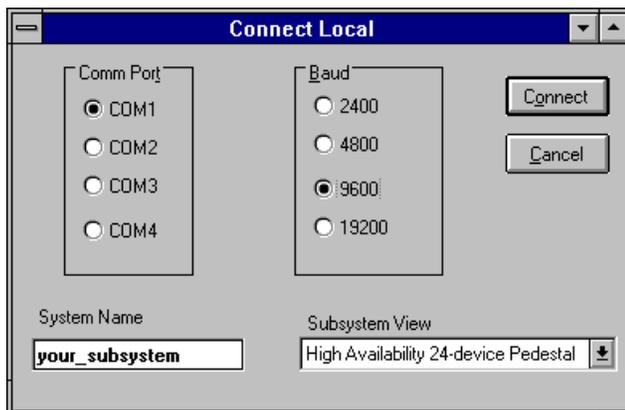
Select the appropriate communications port and select the 9600 baud rate for your subsystem.

NOTE

Default communication parameters for the RAID Array controller are 9600 baud, 8 bits, no parity, one stop bit.

Enter a name for your storage subsystem or leave the default name.

Select from the Subsystem View pull-down list:

- High Availability 24-device Pedestal for a 410/HSZ40 or 450/HSZ50
- 7-device Pedestal (Config setting 1) for a single pedestal 310/HSZ20
- High Availability 7-device Pedestal for a dual pedestal 310/HSZ20

Click on *Connect.* Command Console connects to the subsystem's controller by means of its serial maintenance port and the subsystem icon which turns green. (A red icon indicates a communication problem between Command Console and your subsystem or a failure in the subsystem. Re-check the connection and the settings.)

2.5.6 Setting Failover (for Dual-Controller Operation Only)

For dual-controller operation, you must configure the storage subsystem for failover. Setup failover as follows:

Click the Configure Subsystem Button on the Toolbar.

Select **Subsystem Configuration⎪Open CLI Window** to access the CLI Window (Figure 2–6).

Select **CLI Commands | SET ⎪ Failover Copy = ⎪ This Controller**.

Select **File ⎪ Exit** to close the CLI Window.

Figure 2–6 Setting Failover Using the CLI Window
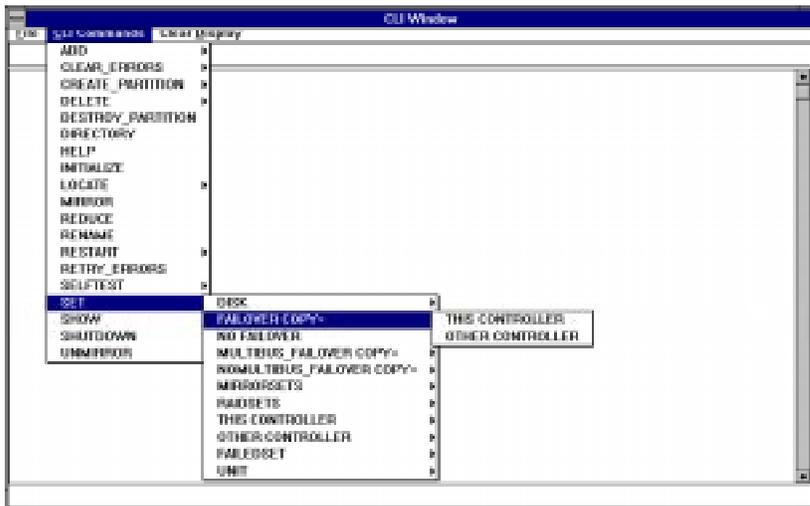
2.5.7 Configuring the RAID Controller

Click the Configure Subsystem button on the Toolbar to access Command Console's configuration function.

Select the **Controllers** tab (Figure 2–7) in the **Subsystem Window**.

Set the controller's operating parameters as follows:

- Install up to four *SCSI ID's, for example* '0,1,2,3' (must not conflict with your host adapter IDs, which are normally set to IDs 6 and 7)
- Set *Cache Policy* to A (write-back cache) or to B (write-through)
- Set *Host Functionality* to D (D is required for NT)
- Set *This Cache Flush Timer* to 10 (10 is recommended)

> **NOTE**
>
> Host Functionality must be set to D in an NT environment.

Click the *Restart This* (single controller installed) or *Restart Both* (dual-controller) button. The message, "Configuring Your System" displays, followed by an information box with the message. There will be a 90-second delay for controller restart.

Figure 2–7 Controllers Tab (Dual-Controller Configuration)
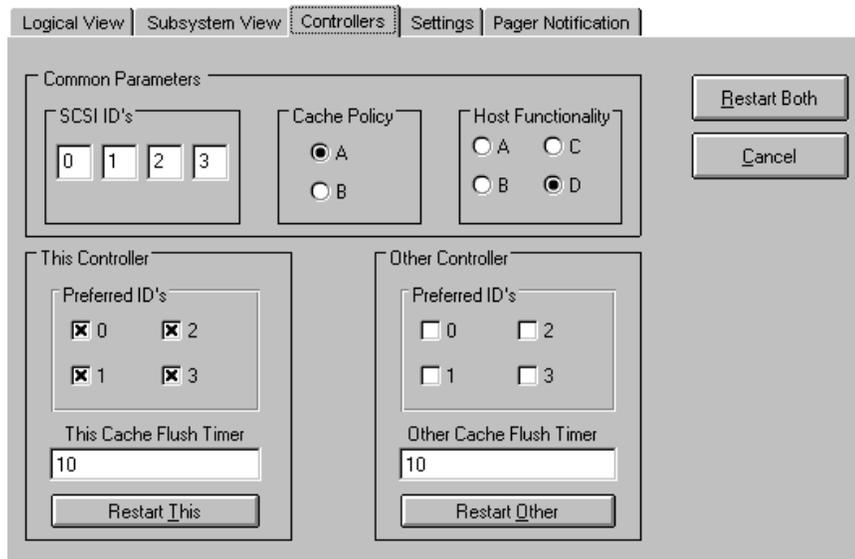
Go on to Section 2.5.8, if you determined in Section 2.5.1 that you need to create storagesets. Otherwise, go to Section 2.6 to install HSZDISK class drivers.

2.5.8 Creating Your First Storageset

Click on the **Configure Subsystem** button and select the **Subsystem View** tab (Figure 2–8) to display a physical view of your RAID Array. This figure shows a 410/450 subsystem view. The views for RAID Array 310 will be similar.

NOTE

The first time you configure an array the disks are displayed as blank. The array controller does not recognize the devices until they are added to the array's configuration. Click the *Add* button to add the devices.

Figure 2–8 Subsystem Window, Subsystem View Tab Selected

Click on the *Create* button to display the *Create* dialog box (Figure 2–9).

Figure 2–9 Create Dialog Box
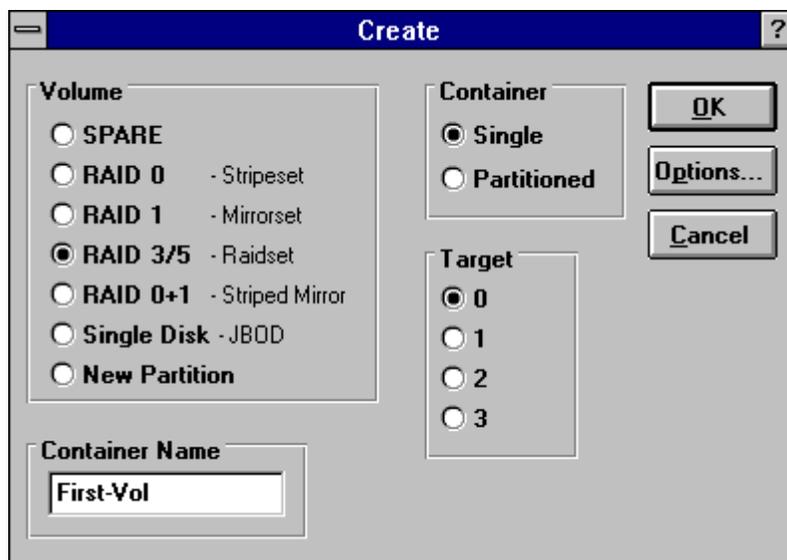
Click on a storageset/volume radio button. For example, click on the *RAID 3/5* radio button.

Type the name of the container in the *Container Name* field.

NOTE

Certain keywords cannot be used as container names such as "Stripe", "RAID", etc. or any other words similar to the RAID array configuration setup.

Select the *Single* radio button. In this example, *Single* is selected to create a non-partitioned volume.

Choose a *Target* number and click on its radio button.

Command Console sets typical (default) volume parameters. To change the default settings, click on the *Options* button to access the *Advanced Options* dialog box (Figure 2–10).

Figure 2–10 Advanced Options Dialog Box
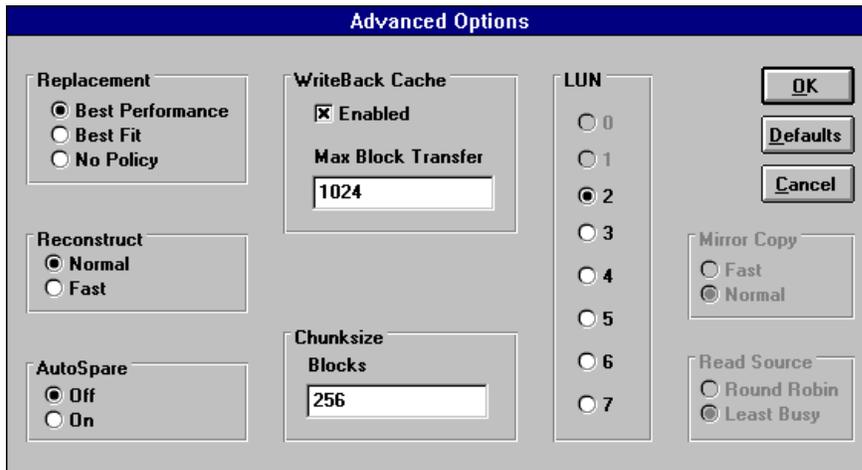
Make the desired changes to the default settings on the *Advanced Options* dialog box and click on *OK*.

When the *Create* dialog box displays, click on *OK*.

A *Select* box displays prompting you to click on the disks that you want to include in the volume. After you select the disks, click the *Create* button. Command Console creates the 3/5 RAIDset, labeling the set members *3/5* (shown in Figure 2–11).

Figure 2–11 Subsystem View Showing 3/5 RAIDset

Refer to the Command Console User's Guide and the on-line documentation to create additional storagesets and complete your storage configuration.

After you complete your storage configuration, proceed to Section 2.6 of this document to install HSZDISK class drivers.

2.6   Installing HSZDISK Class Drivers

The procedure for installing the RAID Array HSZDISK class drivers varies depending upon whether you have a previously installed or a new RAID Array subsystem.

Tables 2–1 and 2–2 provide roadmaps for the order of the procedures you need to follow to install HSZDISK class drivers in each configuration.

Table 2–1   Previously Installed RAID Array - Roadmap for HSZDISK Driver Installation

Step	Go to Section	Description
1	Section 2.6.1	Start Disk Administrator on Host B.
2	Section 2.6.2	Remove drive letter assignments from all except boot partitions.
3	Section 2.6.3	Install HSZDISK class drivers.
4	Section 2.6.4	Reboot, one server at a time.
5	Section 2.6.5	Verify driver installation.
6	Section 2.6.7	Reassign Drive letter assignments to each of the partitions.

Table 2–2   New RAID Array - Roadmap for HSZDISK Driver Installation

Step	Go to Section	Description
1	Section 2.6.3	Install HSZDISK class drivers.
2	Section 2.6.4	Reboot, one server at a time.
3	Section 2.6.5	Verify driver installation.
4	Section 2.6.1	Run Disk Administrator on Host A.
5	Section 2.6.6	Prepare Storagesets for use in a new RAID Array.

2.6.1 Running Disk Administrator

To run the Disk Administrator, follow these steps:

> **NOTE**
>
> To safeguard critical data, backup your system using normal backup procedures before altering device partitions.
>
> The instructions provided here are summary in nature; refer to your Windows NT documentation for additional information.

1. From the **Start Menu**, choose *Programs* and *Administrative Tools* grou*p* for Windows NT 4.0 or the *Administrative Tools* group for Windows NT 3.51.

2. Select **Administrative Tools.**

3. Select **Disk Administrator.**

> **NOTE**
>
> The first time you run Disk Administrator after adding new disks, one or more message window(s) may appear asking you to confirm whether you want to have Disk Administrator provide its "signature" on the new disks. Confirm doing so (by clicking on **Yes**) in order to have Disk Administrator recognize these new disks. For more information on this subject, refer to your Windows NT documentation.

Disk Administrator creates a "Bar Chart" display of your disk configuration, as shown in Figure 2−12. If you are installing a RAID Array for the first time, the Disk Administrator displays the RAID Array storagesets as raw partitions of free space, with no drive letter assignments, and no format.

Before proceeding, you should verify the following:
*   An entry exists in the Disk Administrator display for each of your local disks and RAID Array logical disks.

If not, recheck your configuration. You may need to verify either the logical or physical (or both) configuration of your RAID Array.

- The capacity shown for each device should match the size of the physical disk or the RAID Array storageset.

NOTE

Disk Administrator displays the "usable" capacity of a RAIDset and Mirrorset, not the combined total of the physical members.

If not, recheck the logical configuration for the RAID Array and its members.

Now, go on to Section 2.6.2 for a previously installed RAID Array, or skip to Section 2.6.3 for a new RAID Array.

2.6.2 Removing Drive Letter Assignments Temporarily

Installing HSZDISK drivers when you have a previously installed subsystem causes Windows NT to reassign the drive letters of Host B partitions. Windows NT inserts all RAID array-based partitions ahead of any local (non-shared bus) partitions. Windows NT would, for example, reassign drive letter C from your Host B system disk to the first storageset partition, Disk 0.

Since drive letter reassignments could invalidate your drive mappings, this section shows you how to remove your drive letter assignments prior to installing the HSZDISK drivers.

Remove drive letter assignments for all partitions **except the BOOT partition**. After you install and verify the HSZDISK installation, you start the Disk Administrator and reassign the appropriate drive letters.

To remove drive letter assignments temporarily, follow these steps:

1. Start Disk Administrator as described in Section 2.6.1. Figure 2−12 shows a Disk Administrator display.

Figure 2−12 Disk Administrator Displaying the Current Partitions
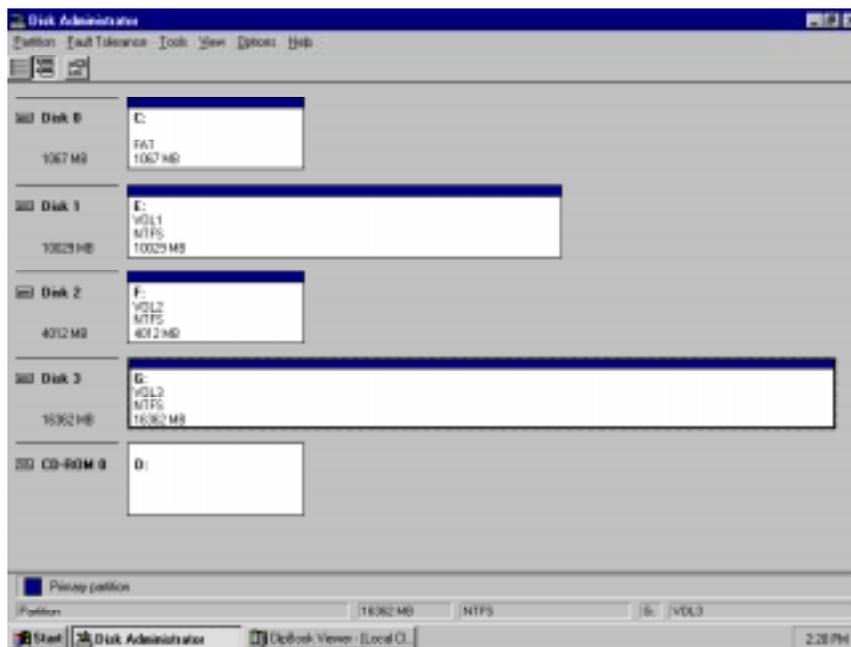
2. Label your partitions, if they are not already labeled, so that you can distinguish each one.
3. Record the drive letters currently associated with each of the partition labels.
4. Click on a partition.
5. From the *Tools* menu select *Assign Drive Letter*.

The Assign Drive Letter dialog box appears, similar to Figure 2−13.

Figure 2–13 Assign Drive Letter
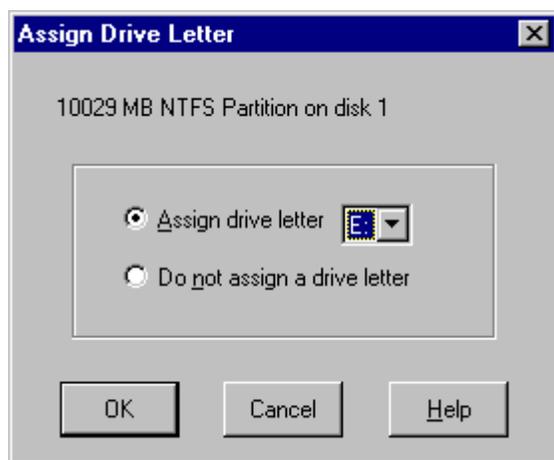
6.   Click the *Do not assign a drive letter* button (as shown in Figure 2−14 and then click OK.

Figure 2–14 Do not assign a drive letter
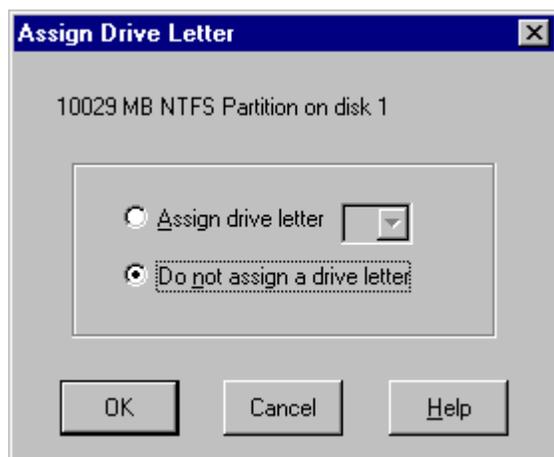
A confirmation dialog box appears as shown in Figure 2−15.

Figure 2–15 Confirmation
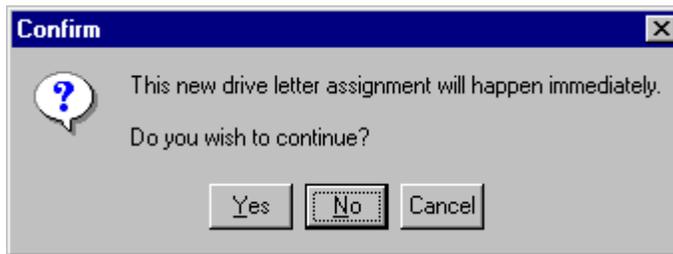
7.	Click Yes. The partition now appears without a drive letter designator similar to the screen shown in Figure 2–16.

Figure 2–16 No Drive Letter Assignments
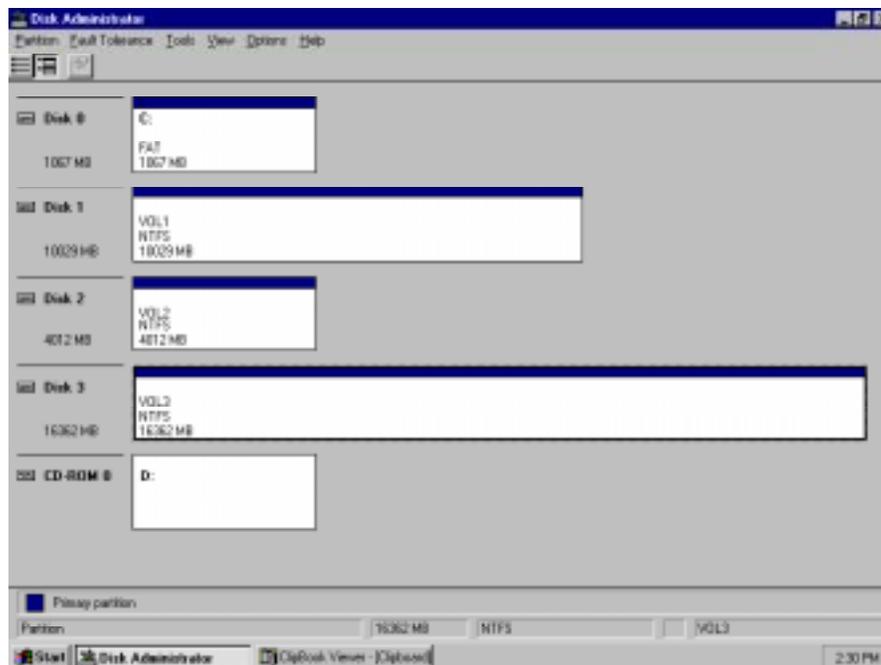
8.	Repeat Steps 4-7 for each of your partitions except the boot partition.

When you finish removing all of the drive letter assignments, go on to Section 2.6.3 to install the HSZDISK Class Driver onto your hosts. After you install and verify the HSZDISK Class Driver, you then reassign the appropriate drive letters to the partitions.

2.6.3 Installing the HSZDISK Class Drivers from the CD-ROM

Install the RAID Array HSZDISK class drivers onto both servers in the cluster.

To install the HSZDISK class drivers, follow these steps:

1. Install the *StorageWorks RAID Array Cluster Utilities and Drivers Distribution CD-ROM* in the CD-ROM drive of Host A.

2. For Windows NT 4.0 systems, choose "Run" from the **Program Manager** File menu. Enter the command shown below substituting your CD-ROM's driver letter for the one shown:

3. **Drive_letter:\Drivers\HzInstal\Setup.exe**

4. Repeat Steps 1-3 on the other host.

2.6.4 Rebooting One Server at a Time After Drivers Installation

After installing the device and HSZDISK class drivers on both servers, reboot **Host A**. When **Host A** has completely rebooted, reboot **Host B**.

NOTE

If HSZDisk is already installed on Node **A**, you do not need to reboot it.

You must reboot the servers for the drivers to take effect. Device drivers must be in effect prior to installing any Windows NT Service Pack, if necessary.

2.6.5 Verifying HSZDISK Drivers Installed

Verify that the HSZDISK class driver properly installed on each of the servers.

To verify the HSZDISK installation, follow these steps:

1. Open the *Event Viewer* from the *Administrative Tools* group.

2. Locate an information icon in the *Event Viewer* window with HSZDISK for the *Source*, similar to the event shown in Figure 2–17.

Figure 2–17 Event Viewer Log

3. Double click on the HSZDISK entry and an entry detail screen appears similar to the screen shown in Figure 2–18.
    The message in the detail screen indicates whether the HSZDISK class driver was successfully installed.

Figure 2–18 Event Detail

If the HSZDISK class driver was successfully installed on Host A, repeat steps 1−4 of this section to verify that it was successfully installed on Host B.

If the HSZDISK class driver did not load successfully, verify that no errors appear in the Event Viewer window for the DECKZPSX driver for Alpha systems or the AIC78XX driver for Prioris systems.

If errors appear for either of these drivers in the Event Viewer window, a connectivity problem may exist on the shared SCSI-bus. HSZDISK will not load while these problems exist. Check for the following:

- Correct termination
- Faulty cables or connections
- Proper adapter seating in the system backplane
- SCSI ID conflicts

Also, review Chapter 1 for installation procedures.

After resolving any of these problems, reload the HSZDISK driver.

If the HSZDISK driver still fails to reload, call field service (as specified on the warranty card) or your Sales Representative.

Now, go on to Section 2.6.6 for directions on how to prepare storagesets for use in a new RAID Array subsystem. Otherwise, skip to Section 2.6.7 for instructions on how to reassign drive letters to partitions of a previously installed RAID Array.

2.6.6 Preparing Storagesets for Use in a New RAID Array Subsystem

NOTE

Storagesets should be created using SWCC before proceeding with this step.

When installing a cluster with a new RAID Array subsystem, you need to prepare the storagesets for use.

Follow these steps for creating partitions, assigning drives, formatting and labeling the storagesets in your RAID Array subsystem:

1. Run Disk Administrator as specified in Section 2.6.1.

2. Create partitions as follows:
    - For each disk shown, select the partition area that you wish to create.
    - Click on the **Partition** pull-down menu. From the **Partition** pull-down menu, choose **Create** (see Figure 2–19).

    The **Create** window opens (see Figure 2–20).

NOTE

A disk cannot be accessed unless it contains at least one valid partition formerly created under Disk Administrator.

Figure 2–19 Partition Pull-Down Menu

Figure 2–20 Create Primary Partition Window
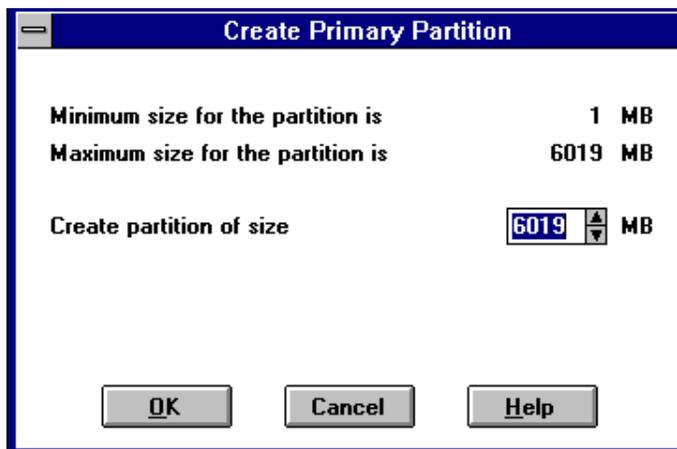
In the window, enter the partition size you want, then click on **OK**. (Depending upon the partition size you choose, a message window may appear asking you to confirm your selection.)

3. Continue to create new partitions until all disks have been partitioned.

4. Optional: Make disk logical names permanent.

    The process of creating partitions assigns a logical name (the letter "C," "D," etc.) to each partition. These letter assignments, under Windows NT, will normally "float." That is, they are subject to changing (after reboot), if the disk configuration changes.

    You may, however, make these assignments "permanent." (For more information on this subject, you should consult your Windows NT documentation.) If you wish to make the letter assignments "permanent," access the **Tools** pull-down menu. From the choices given, select **Drive Letter** then choose **To Assign**. This process must be repeated for each partition (drive letter) that you wish to make "permanent."

5. When you have created all your partitions, go back to the **Partition** pull down menu and click on **Commit Changes Now** (see Figure 2–19).

    A message window will then appear asking you to confirm that you wish to commit these changes.

After confirming that you wish to commit the changes, a new message screen should appear advising that the "Commit Changes" action was successful.

> **NOTE**
>
> A message window will appear following this step asking you if you wish to save a copy of the configuration to a floppy. You may do so at this time, as prompted by the screen display.

6. While still running Disk Administrator, click on the **Tools** pull-down menu, then select **Format** (see Figure 2–21). The **Format** menu choices (see Figure 2–22) allow you to choose either **FAT** or **NTFS**. You must select NTFS options to use the disks as clustered disks.

> **NOTE**
>
> Windows NT Clusters requires the NTFS format for clustered disks.

You may also choose the **Quick Format** option. Select **OK** to begin the format process. For further information regarding these options, refer to your Windows NT documentation.

A message window appears advising you when the formatting is complete.

Figure 2–21 Tools Pull-Down Choices
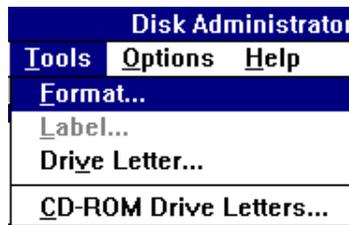
Figure 2–22 Format Menu
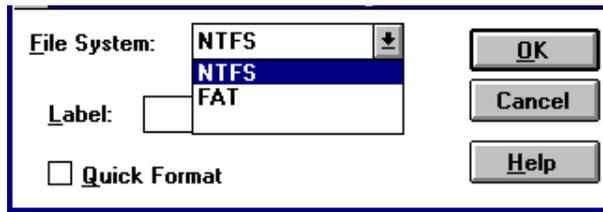
7. Continue to format each new partition until all partitions have been formatted.

8. When all partitions have been formatted, close Disk Administrator. At this point, the configuration has been completed on Host A, and is recognized by Windows NT.

2.6.6.1 Running Disk Administrator on Host B

After preparing the storagesets for use on Host A, run Disk Administrator on Host B, so that Windows NT can view the current device configuration. Once you start Disk Administrator on Host B and Windows NT has polled the current device configuration, exit the Disk Administrator on Host B.

2.6.6.2 Rebooting Host B

Reboot **Host B** so that Windows NT will recognize the new device configuration.

This completes the procedures for preparing disks for use with a new RAID Array subsystem.

2.6.7 Reassigning Drive Letters to Partitions of a Previously Installed RAID Array

To reassign drive letters to host B partitions of a previously installed RAID Array after you install the HSZDISK class drivers, follow these steps:

1. Start Disk Administrator as described in Section 2.6.1. The disk administrator displays all the existing partitions, similar to the window shown in Figure 2−23. The only partitions with drive letters are the boot partition and any non-disk devices, such as a CD−ROM drive.

Figure 2−23 How Partitions Appear After you Load HSZDISK Drivers
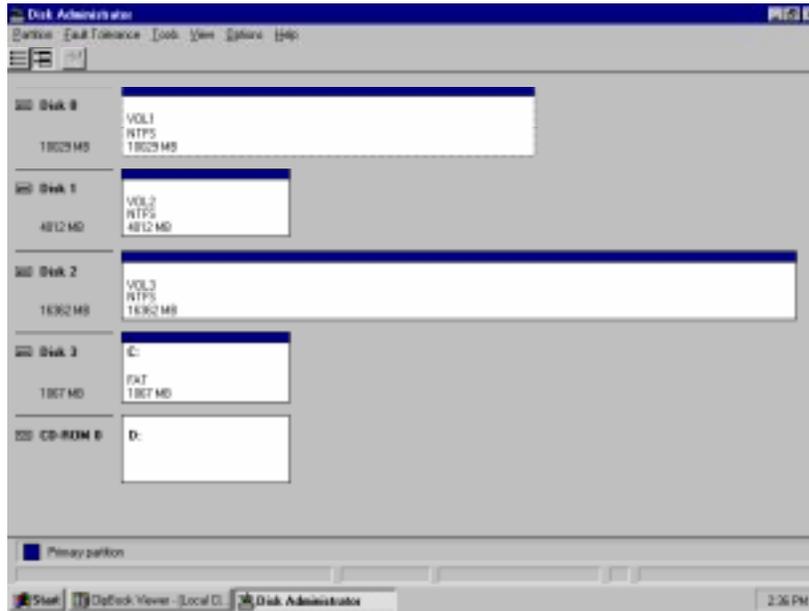
2. Highlight a partition and from the *Tools* menu select *Assign Drive Letter*. The Assign Drive Letter window appears displaying the next available drive letter, similar to the window shown in Figure 2−24.

**Figure 2–24 The Assign Driver Letters Window Displays the Next Available
Drive Letter**
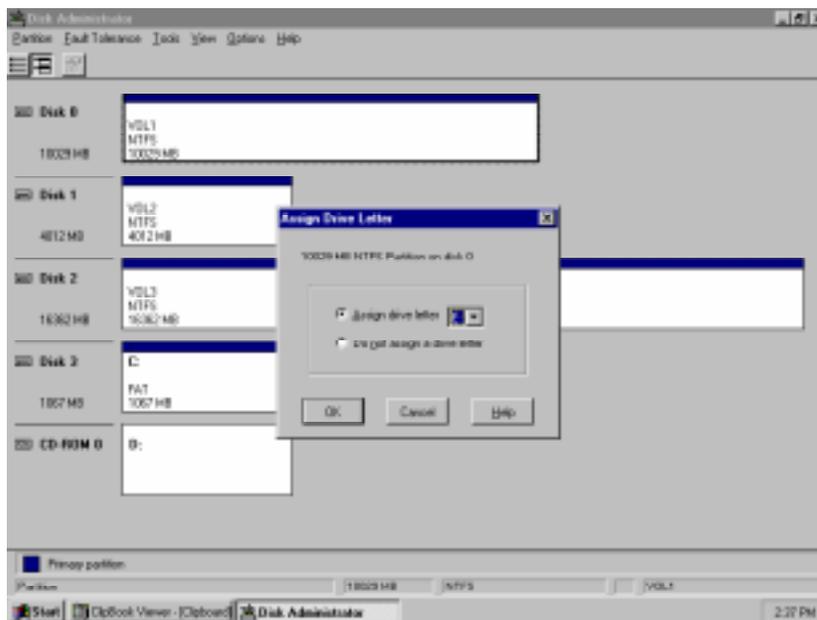
3. Click OK if you want to assign the selected drive letter. Otherwise, click
   the *Assign drive letter* radio button, select another drive letter from the
   pick list and click OK. If the letter you want to assign doesn't appear in
   the list, Windows NT may have already assigned that letter to the CD–
   ROM drive. You can unassign that letter from the CD–ROM to free it for
   use.

4. At the confirmation dialog box, Click Yes. The partition now appears
   with the specified drive letter designator similar to the screen shown in
   Figure 2–25.

Figure 2–25 A New Drive Letter Assignment
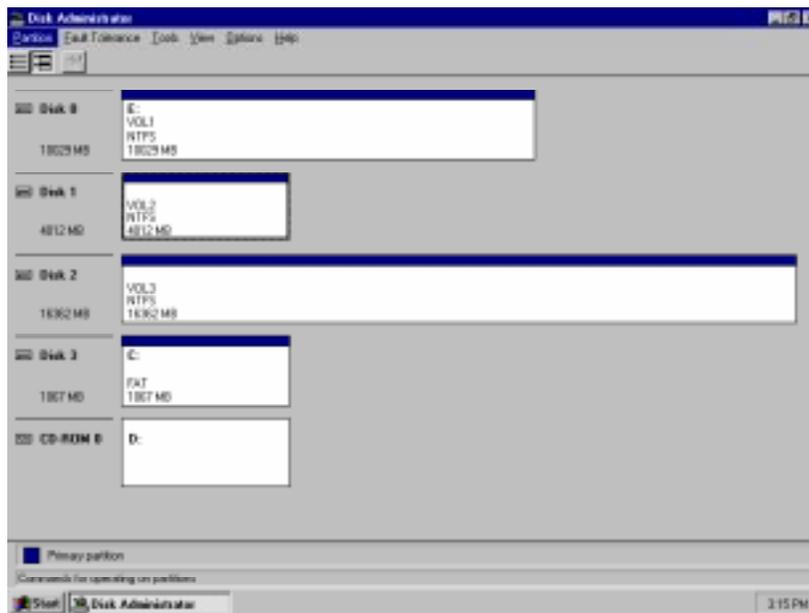
5. Repeat Steps 2 through 4 until you have assigned drive letters to all of the partitions that need one, similar to the window shown in Figure 2–26.

Figure 2–26 All the Drive Letters Reassigned

3
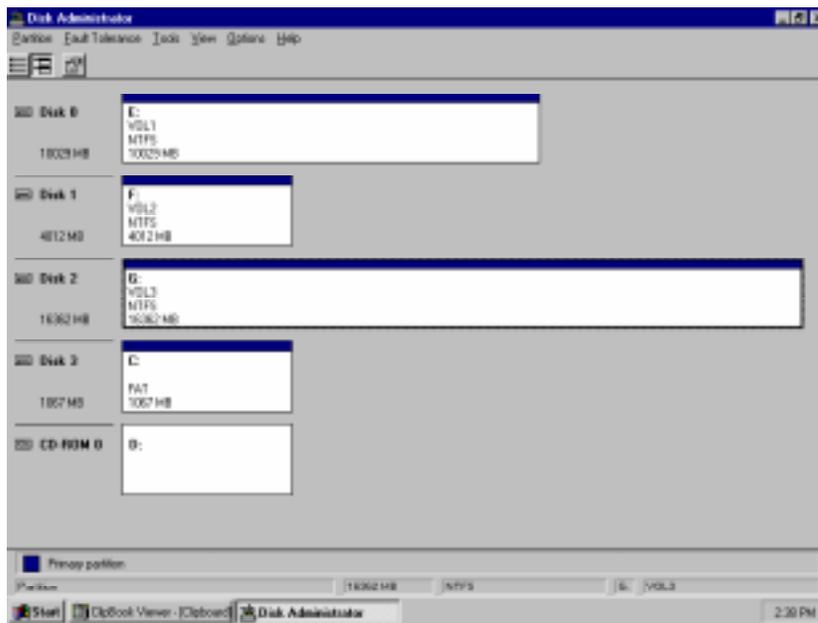
Preparing to Upgrade RAID Array Controller Software

This chapter contains the procedures for backing up and upgrading the RAID Array controller software.

3.1 Backing-up your system

Before performing the controller software upgrade, backup all data and files from the RAID Array.

3.2 Recording the RAID Array Configuration

It is recommended that you create a record of the subsystem configuration before the upgrade. From Command Console or RAID Manager, open a CLI window and issue the following command:

```
show this_controller full
```

Record the following information in the blanks below (SCSI Targets, Preferred Targets, Cache Flush Timer, Cache Policy, and Host Functionality Mode):

Fill in the blanks below.

```
Controller:

     ZG43700116 HSZ20 Controller Software, Hardware  A02

        Not configured for dual-redundancy

        SCSI address 7

        Time: NOT SET
Host port:

        SCSI target(s) _____  Preferred target(s) _____
Cache:

        16 megabyte write cache, version 2

        Cache is GOOD

        Battery is GOOD

         No unflushed data in cache

        CACHE_FLUSH_TIMER = _____

         CACHE_POLICY = _____

         Host Functionality Mode = _____
Licensing information:

        RAID (RAID Option) is ENABLED, license key is
        VALID

        WBCA (Writeback Cache Option) is ENABLED, license
        key is VALID

        MIRR (Disk Mirroring Option) is ENABLED, license
        key is VALID
Extended information:

        Terminal speed 9600 baud, eight bit, no parity, 1
        stop bit

        Operation control: 00000004  Security state code:
        95018

         Configuration backup disabled
```

3.2.1 Record Logical Units

List the Logical Units by entering:

```
                    SHOW UNIT FULL
LUN                                  Uses
_____
D100                                 S28

  Switches:
    RUN                              NOWRITE_PROTECT
    READ_CACHE
    WRITEBACK_CACHE
    MAXIMUM_CACHED_TRANSFER_SIZE = 32

  State:
    ONLINE to this controller
    Not reserved
    PREFERRED_PATH = THIS_CONTROLLER

  Size: 20547350 blocks

D200                                 M1
  Switches:
    RUN                              NOWRITE_PROTECT
    READ_CACHE
    WRITEBACK_CACHE
    MAXIMUM_CACHED_TRANSFER_SIZE = 32

  State:
     ONLINE to this controller
    Not reserved
    PREFERRED_PATH = THIS_CONTROLLER

   Size: 4109470 blocks
```

Record the appropriate information in the following table. The top line shows how to record entries for D100 of the sample.

Table 3–1 Logical Unit Table

LUN	USES	RUN	WRITE PROTECT	READ CACHE	WRITEBACK CACHE	MAX CACHED TRANSFER SIZE
D100	S28	X		X	X	32

Next, list the storagesets you have configured:

```
SHOW STORAGESETS FULL
```

The controller responds with a display similar to that shown below:

```
Name               Storageset          Uses            Used by
S28                stripeset           DISK130         D100
                                       DISK220
Switches:

CHUNKSIZE = 256 blocks
State:
  NORMAL
  DISK130 (member  0) is NORMAL
  DISK220 (member  1) is NORMAL
  Size:  50268168 blocks

M1                 mirrorset           DISK100         D200
                                       DISK110
Switches:
  POLICY (for replacement) = BEST_PERFORMANCE
  COPY (priority) = NORMAL
  READ_SOURCE = LEAST_BUSY

MEMBERSHIP = 2, 2 members present
```

Record the storageset information in the Storageset Table (Table 3–2). The first row shows how to record for S28 of the sample:

NOTE

Not all column headings apply to all storagesets.

Table 3–2 Storageset Table

NAME	STORAGE-SET	USES	USED BY	POLICY	COPY	READ SOURCE	RECON-STRUCT	CHUNK-SIZE
S28	Stripeset	DISK130 DISK220	D100					256

FAILED SET	AUTOSPARE	NOAUTOSPARE

3.3   Copy the Controller Software to System Disk

Insert the *StorageWorks RAID Array Cluster Utilities & Drivers* distribution CD into the CD-ROM drive of your system. Copy the latest version of the controller software from the \firmware directory into a temporary directory on the system disk. Please check the Release Notes for information about the latest version of software.

3.4   Setting up Terminal Emulation Programs for Download

To upgrade, you will need to use a terminal emulation program to perform a download of the firmware to the controller over a serial line connected to the com port of your host system. The following sections describe how to launch and set up these programs. To accomplish the download using Windows operating system's native terminal emulation applications, exit any Windows sessions before proceeding with the download operation.

3.4.1   Download with Windows 3.1/3.11, Windows for WorkGroups, or Windows NT 3.51

For these operating systems, start and setup the *Terminal* applet as shown below:

1. Open the Windows *Accessories* program group and start the *Terminal* program.

2. After the *Terminal* program starts, select the *Communications* option from the Settings menu. The Communications window appears.

3. Select the *Terminal* program settings that appear in the *Communications* window as follows:

    - 9600 baud

    - 8 data bits

    - parity = XON/XOFF

    - one stop bit

    - none for flow control

    - specify the connector to the RAID Array controller (for example, COM1)

4. Press the Enter key. The default command prompt for the RAID Array should appear in the terminal window.

You are now ready to perform the controller software download. Proceed to section 3.5 if you have a 310/HSZ20 or a single controller RAID Array 410/HSZ40 or 450/HSZ50. Proceed to section 3.6 if you have a dual-redundant RAID Array 410/HSZ40 or 450/HSZ50.

3.4.2 Download with Windows 95 or Windows NT 4.0

For these operating systems, start and set up the *HyperTerminal* program as
shown below:

1. Launch *HyperTerminal* from the *Start* menu.

2. Enter a *Connect* name.

3. Select the appropriate COM port for your system in the *Connect To* window.

4. Select the following properties for Port Settings:

    - Baud Rate = 9600

    - Data Bits = 8

    - Stop Bits = 1

    - Parity = XON/XOFF

5. Select the *File/Properties* menu and choose VT100 emulation from the
    Settings page.

6. Press the Enter key. The default command prompt for the RAID Array
    should appear in the terminal window.

You are now ready to perform the controller software download. Proceed to
section 3.5 if you have a 310/HSZ20 or a single controller RAID Array
410/HSZ40 or 450/HSZ50. Proceed to section 3.6 if you have a dual-redundant
RAID Array 410/HSZ40 or 450/HSZ50.

**3.5 Upgrading RAID Array 310/HSZ20 or Single Controller RAID Array
410/HSZ40 or 450/HSZ50**

1. Change the controller's baud rate to 19200 for faster download by typing:

    set this_controller terminal_speed=19200

2. Change the terminal program's baud rate to match the controller's. For the
    Terminal applet, select the *Communications* option from the Settings menu.
    For HyperTerminal, use the *Configure* button from the *File/Properties*
    menu.

3. Press the Enter key. The default command prompt for the RAID Array
    should appear in the terminal window. You may need to press
    HyperTerminal's *Disconnect* button followed by *Connect* to re-establish the
    connection to the RAID Array at the new baud rate.

NOTE

The Code Load/Code Patch (CLCP) Utility messages shown are for a RAID Array 310 Subsystem. The CLCP utility messages for other RAID Array subsystems are similar.

---

4. Start the CLCP utility. At the command prompt type: **run clcp**.

```
Select an option from the following list:

Code Load and Patch Utility Main Menu

          0:   Exit
          1:   Enter Code LOAD utility
          2:   Enter Code PATCH utility

Enter option number (0..2) ? 1
```

5. Type: 1 and press the Return key. The utility displays the following message:

```
You have selected the Code Load Utility.  This utility is used
to load a new software image into the program card currently
inserted in the controller.

Type ^Y or ^C (then RETURN) at any time to abort code load.

The code image may be loaded using SCSI Write Buffer commands
through the SCSI Host Port, or using KERMIT protocol through
the Maintenance Terminal Port.

          0:   Exit
          1:   Enter the SCSI Host Port
          2:   Use the Maintenance Terminal Port

Enter option number (0..2) [0] ? 2
```

6. Type: **2** and press the Return key. The utility displays the following message:

```
---------------------------------------------

Perform the following steps before continuing:

    *get new image file on the serial line host computer
    *configure KERMIT with the following parameters:
     terminal speed 19200 baud, eight bit, no parity, 1 stop bit

It will take approximately 35 to 45 minutes to perform the code
load operation.

WARNING:  proceeding with Code Load will overwrite the current
content of your program code with a new image. Enter Y (then
RETURN) to continue
[N] ? y

Start KERMIT now…
```

---

7. If using the Terminal applet, select *Binary Transfers* from the *Settings* menu to start Kermit. If you are using HyperTerminal, select *Send File* from the *Transfer* menu and choose the Kermit protocol. In either case, select the image of the controller software you copied to your system disk to download.

CAUTION

You must use a binary transfer mode. Failure to use a binary transfer mode will result in corruption of the controller software.

---

8. When the download completes, wait for the PC card to be reprogrammed. This usually takes from 3 to 5 minutes. **Do not interrupt this operation**.
9. Verify that this process successfully copied the new version of the software onto the controller. At the CLI prompt, type:

    HSZ20> **show this_controller**

The CLI displays information indicating the current software version of the controller similar to the following:

```
Controller Model: HSZ20

Serial Number: CX54300265 Hardware version: A02(02)

Software Version:V31Z-2
Informational Report
Instance Code:  0102030A
Last Failure Code:86000020 (No Last Failure Parameters)
Controller:
          HSZ20 CX54300265 Software V30Z-2, Hardware A02\Not
          configured for dual-redundancy
          SCSI address 7
          Time: NOT SET

Host Port:

           SCSI target(s) (0, 1, 2, 3), Preferred target(s)
           (0, 1, 2, 3)
           TRANSFER_RATE_REQUESTED = 10MB

Cache:

16 megabyte write cache, version 2
Cache is GOOD
Battery is GOOD
No unflushed data in cache
CACHE_FLUSHED_TIMER = 5 (seconds)
CACHE_POLICY = A
Host Functionality Mode = D.
```

10. Set the controller baud rate back to 9600. Type:

    set this_controller terminal _speed=9600

11. Change the terminal program's baud rate to match the controller's. Review step #2 above. It is necessary to return the controller's baud rate to 9600 for communication with Command Console.

3.6   Upgrading Dual-Controller RAID Array 410/HSZ40or 450/HSZ50

1. Change both the controller's baud rate to 19200 for faster download by typing:

    set other_controller terminal_speed=19200

2. Then type:

    set this_controller terminal_speed=19200

3. Change the terminal program's baud rate to match the controller's. For the Terminal applet, select the *Communications* option from the Settings menu. For HyperTerminal, use the *Configure* button from the *File/Properties* menu.

4. Press the Enter key. The default command prompt for the RAID Array should appear in the terminal window. You may need to press HyperTerminal's *Disconnect* button followed by *Connect* to re-establish the RAID Array connection at the new baud rate.

5. Temporarily disable dual-redundancy by issuing the following command:

    set nofailover

    The other controller should shut down following this command.

6. Start the CLCP utility. At the command prompt, type: **run clcp.**

7. Choose option 1 to enter the *code load* utility.

8. Choose option 2 to use the *maintenance terminal* port.

9. Choose YES to proceed with the download.

10. If using the Terminal applet, select *Binary Tranfers* from the *Settings* menu to start Kermit. If you are using HyperTerminal, select *Send File* from the *Transfer* menu and choose the Kermit protocol. In either case, select the image of the controller software you copied to your system disk to download.

CAUTION

You must use a binary transfer mode. Failure to use a binary transfer mode will result in corruption of the controller software.

---

11. When the download completes, wait for the PC card to be reprogrammed. This usually takes from 3 to 5 minutes. **Do not interrupt this operation.**

12. Issue the following command to verify that new version was loaded:

> **show this_controller**

Look for the new version in the third line of the display output.

13. Issue the following command to shut down this controller:

> **shutdown this_controller**

14. Move the serial cable connector to the **other** controller. Depress the restart button on the **other** controller (the one you are moving the cable to).

15. Hit Enter. When the command prompt for the other controller appears on the terminal window, run the Download utility. At the command prompt, type: **run clcp**.

16. Repeat steps 7 through 12 to download the software.

17. To return the subsystem to dual-redundant operation, depress both reset buttons simultaneously. Both controllers should restart and a message will appear noting that the controllers are misconfigured.

18. Issue the following command:

> **set failover copy = this_controller**

The other controller will restart.

19. This completes the upgrade process. Verify that the subsystem is operating in dual-redundant mode by issuing the following command:

> **show this_controller**

20. Set both controller's baud rate back to 9600. Type:

> **set other_controller terminal_speed=9600**

> **set this_controller terminal_speed=9600**

Change the terminal's program baud rate to match the controller's. See Step #3 above. It is necessary to return the controller's baud rate to 9600 for communication with Command Console.

4

Using the Command Console as a Remote Application

Using the Command Console as a Remote Application for networked RAID management entails the selection and installation of the Command Console on both the PC and each clustered host.

To use the Command Console as a remote application, for networked RAID management, you must select a PC for your management station, install the Command Console on the PC and install the Command Console Agents on each of the clustered hosts. For more information about networked remote Command Console installations, see the *Command Console V1.1 User's Guide*.

The major steps for using the Command Console as a remote application include the following:

- Installing Windows NT TCP/IP Network Transport
- Selecting a network PC for your management station and installing the client software
- Installing the Agents on your cluster servers

4.1 Installing Windows NT TCP/IP Transport

The SWCC Command Console uses the TCP/IP transport for communications in a networked remote client environment. Both hosts in the cluster must be configured for *simple TCP/IP services*. If either of the hosts have not been configured for *simple TCP/IP services,* see the *Windows NT Server System Guide* to configure them.

4.2 Installing the Command Console on a Networked, Remote Client

Select Windows 95 or Windows NT PC clients for management stations and install the client software. See the *Command Console Version 1.1 User's Guide* for more information.

Command Console installs from the *StorageWorks RAID Array Controller Software* distribution CD-ROM using a standard Windows installation routine.

To install Command Console:

1. Place the CD in the CD-ROM drive.

2. Open the File menu in the Program Manager for Windows NT 3.51 or click on the *Start* Button for Windows NT 4.0.

3. Select the RUN option.

4. In the text box, type *drive_letter:*\SWCC\CLIENT\INSTALL and click OK.

5. Follow the instructions in the setup program to complete the installation.

4. 3 Installing the Agent

The Command Console Agent is a companion application to the Command Console Client graphical user interface (GUI) program. The Command Console Agent runs on your cluster host systems.

You must install the Command Console Agent on each of your hosts.

Install Agents only after installing the Cluster Management software and defining failover groups. Each of the clustered servers must be configured as the primary server for at least one of the RAID Array storagesets. This allows the Command Console to communicate with the RAID Array through either host SCSI channel in the event of a server failure—a failover situation.

You install the agents as a service on each server. The agents enable communication between the RAID Array and the Command Console on a remote client system. The agents communicate with the RAID Array through the SCSI bus and the communications LUN storageset. They communicate with the remote clients through the Windows NT TCP/IP network transport.

Installing the Command Console Agent requires the following major steps:

- Starting the Agent Configuration Utility

- Specifying Agent Configuration Information

- Starting the Agent

4.3.1 Starting the Agent Configuration Utility

To start the Agent Configuration Utility on each of the hosts, follow these steps:

1. Insert the *StorageWorks RAID Array Cluster Utilities and Drivers* distribution CD–ROM into the CD–ROM drive of one of your hosts.

2. Open *File Manager* or *Explorer*.

3. Locate the *\Agents* subdirectory on the *StorageWorks RAID Array Controller* distribution CD–ROM.

4. Open the *Alpha* or *Intel* directory.

5. Double click on *Setup.exe*.

6. Click *Windows NT*.

7. Select the drive on which you want to install the Command Console Agent.

    The Agent Configuration Utility starts as shown in Figure 4–1.

Figure 4–1 Agent Configuration Utility Menu
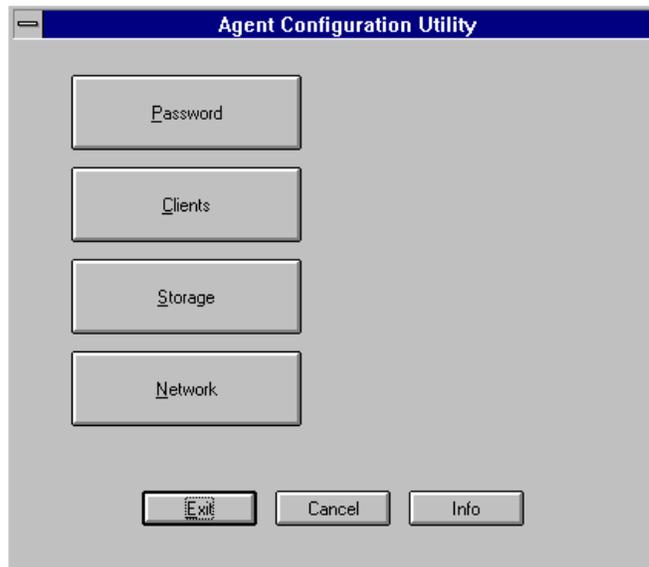
4.3.1.1 Specifying Agent Configuration Information

To specify the Agent Configuration information, follow these steps:

1. Click *Password*. The *Password* dialog box appears, as shown in Figure 4-2.

Figure 4–2 Agent Password Dialog Box
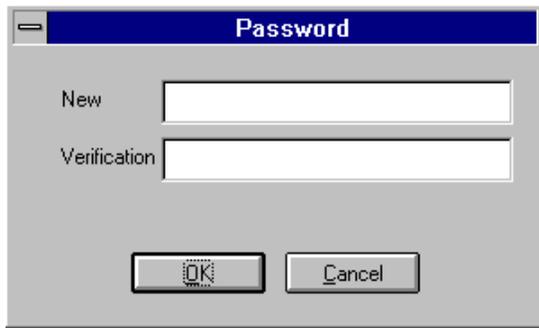
2. Enter a password in the New and Verification text boxes and click OK. A Password validation message appears. Click OK.
3. Click Clients. The Client List message appears. Click OK. The Client Configuration Utility window appears, as shown in Figure 4–3.

Figure 4–3 Client Configuration Utility Window
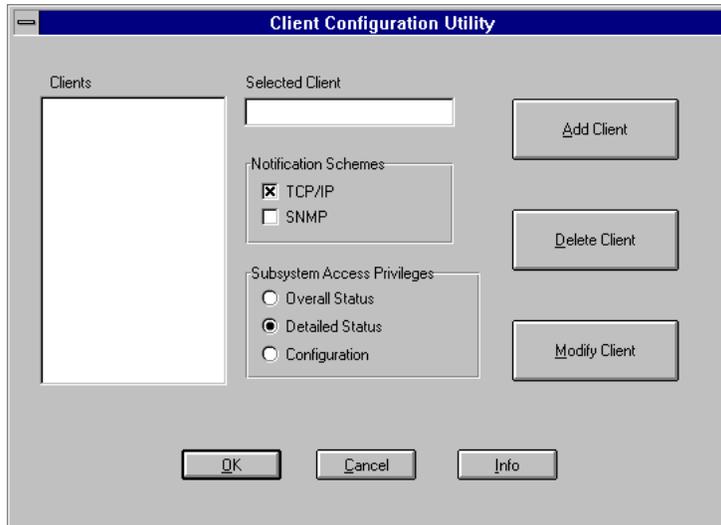
4. Enter client name and click the radio buttons for the appropriate *Subsystem Access Privileges*, similar to Figure 4–4.

Figure 4–4 Client Configuration Utility Window - Client Name Entered
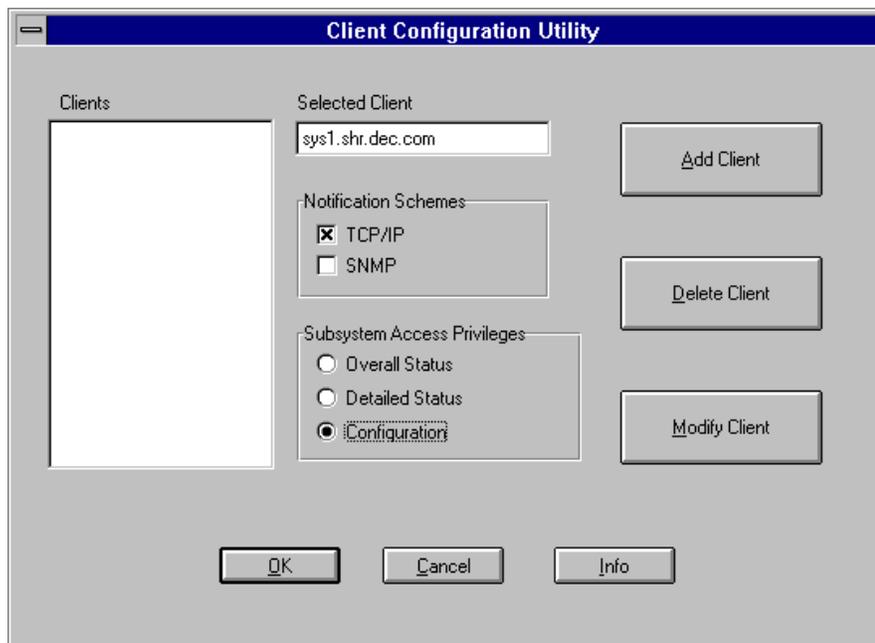
5. Click Add Client. The client name now appears in the *Clients* list on the left, similar to window shown in Figure 4–5.

Figure 4–5 Client Configuration Utility Window - Client Name Added
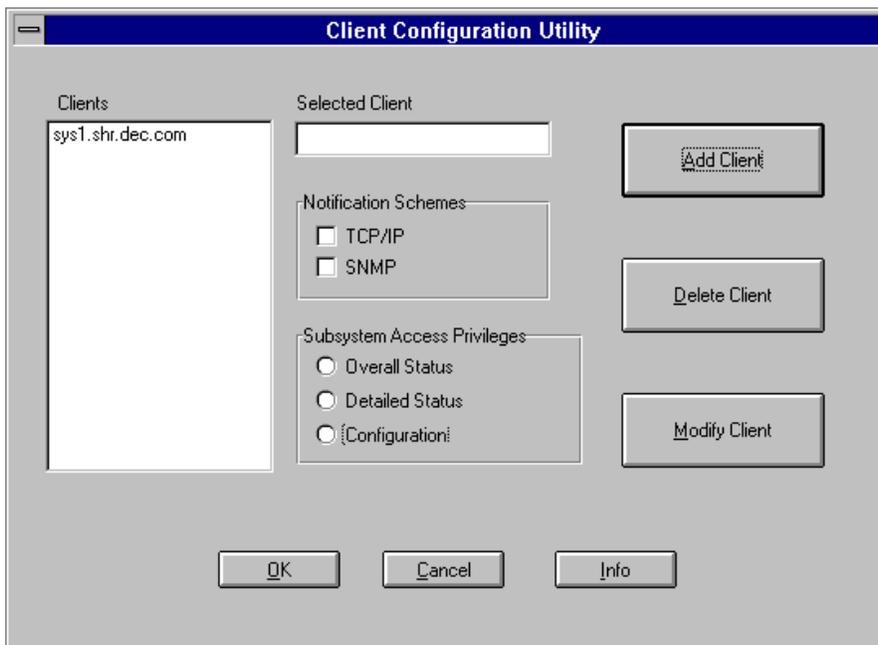
6. Add the second client name as specified in Steps 4 and 5. Click OK when you finish adding client names. The *Agent Configuration Utility* window appears.

7. Click *Storage*. The Storage list message appears. Click OK. The *Storage Configuration Utility* window appears, similar to the window shown in Figure 4–6.

Figure 4–6 Storage Configuration Utility Window
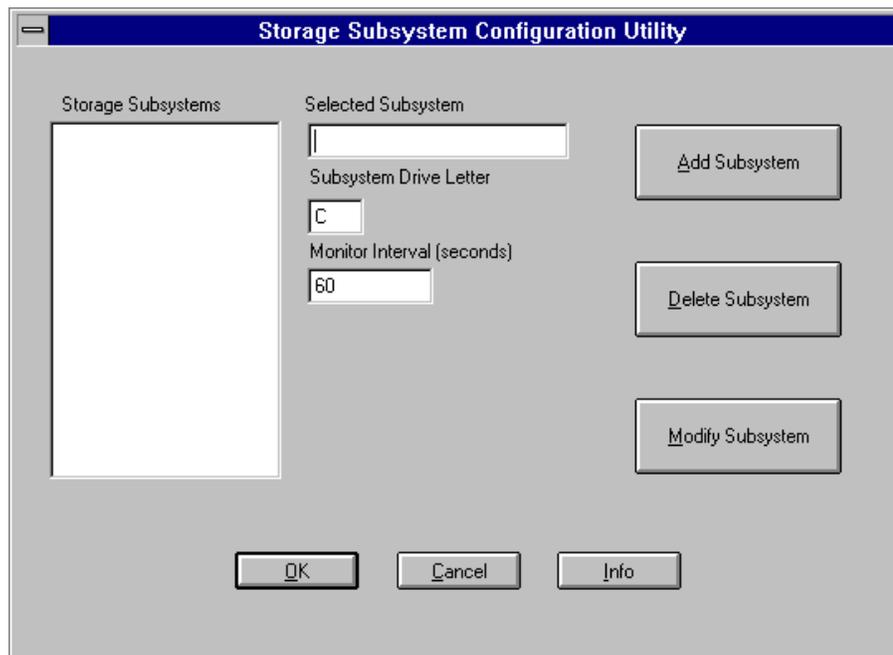
8. Enter the name of your storage subsystem, its Window NT drive letter and the monitoring interval in seconds, as shown in Figure 4–7.

NOTE

If you will be using the Command Console to monitor subsystems in addition to the ones used in your cluster, specify names for your cluster subsystems so that they will appear consecutively (alphabetically) in the list. For example, name the subsystems: cluster1 and cluster2, or A and B. This way, your cluster servers will be listed adjacent to each other, and you won't have to search through the list to locate each of the subsystems in the cluster.

Figure 4–7 Subsystem Specified
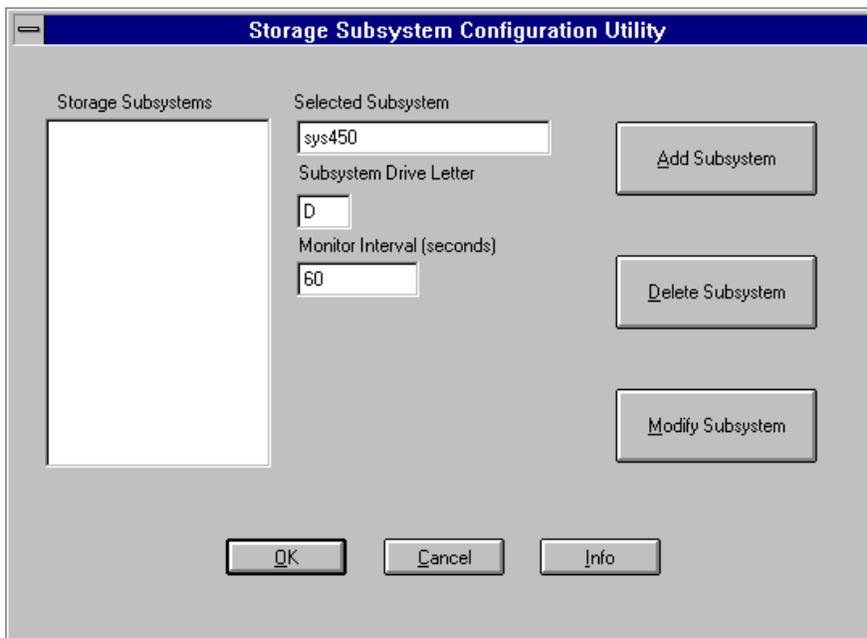
9. Click <u>A</u>dd Subsystem. The subsystem you specified appears in the *Storage Subsystem* list on the left of the *Storage Subsystem Configuration Utility* window, similar to the window show in Figure 4–8.

Figure 4–8 Subsystem Added
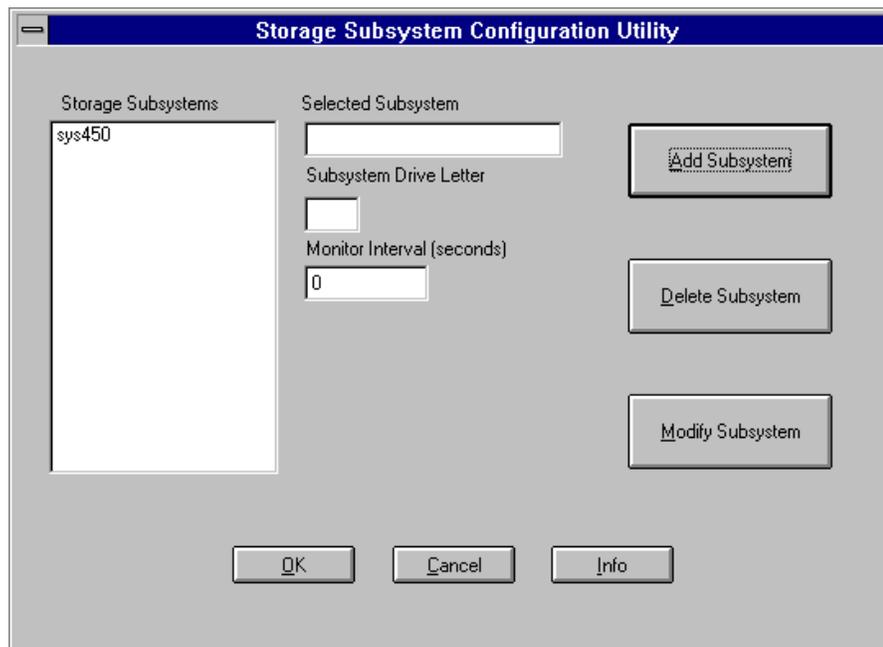
10. Click OK when you finish adding subsystems. The *Agent Configuration Utility* window appears.

11. Click *Network*. The *Network Configuration Utility* window appears as shown in Figure 4–9.

Figure 4–9 Network Configuration Utility
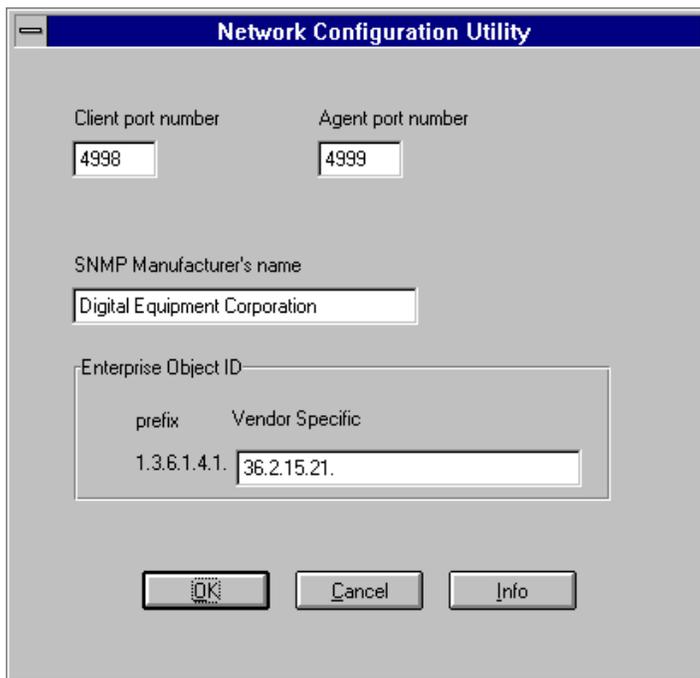
12. Change the default network configuration only if the default port numbers
    are being used by another application. If a conflict exists, click in the *Port*
    fields button and change the default settings. For more information on port
    numbers (windows socket numbers), click on the *Info* button.

    Click OK when you finish verifying or changing the port numbers. The
    Agent Configuration Utility window appears.

13. Click *Exit* to complete the agent installation.

4.3.1.2 Starting the Agent

To start the Command Console Agents on each of your hosts, follow these steps:

1. Open *File Manager* or *Explorer*.

2. Locate the *\Steam* directory.

3. Double click on *Steam.exe* to start the agent.

4. To verify that the agent started, open *Control Panel*.

5. Click on the *Services* applet. The *Services* window appears, similar to the window shown in Figure 4–10.

> **NOTE**
>
> In addition to the procedure specified in this section for starting the Agent, the Agent will start automatically during reboot.

Figure 4–10 Services Window
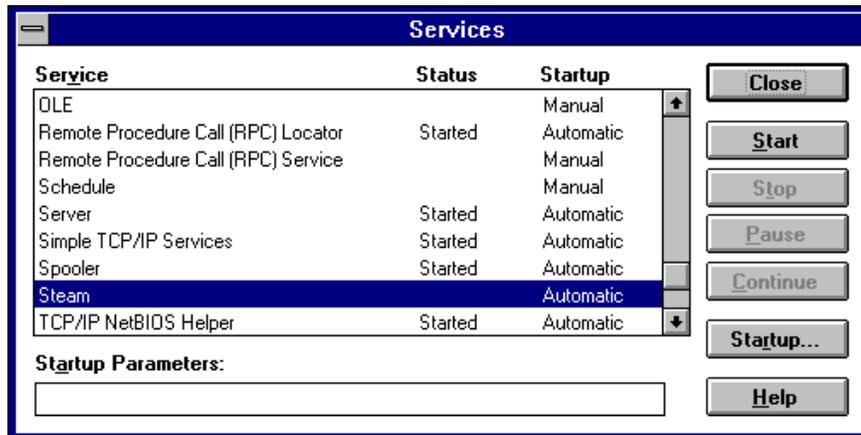
6. If *Steam* does not appear with *Started* for its *Status*, click on *Steam* and then click on *Start*.

7. If *Steam* still does not appear with *Started* for its *Status*, as shown in Figure 4–10, confirm that the host on which you installed the agent is a primary server for at least one storageset.

Figure 4–11 Steam Started
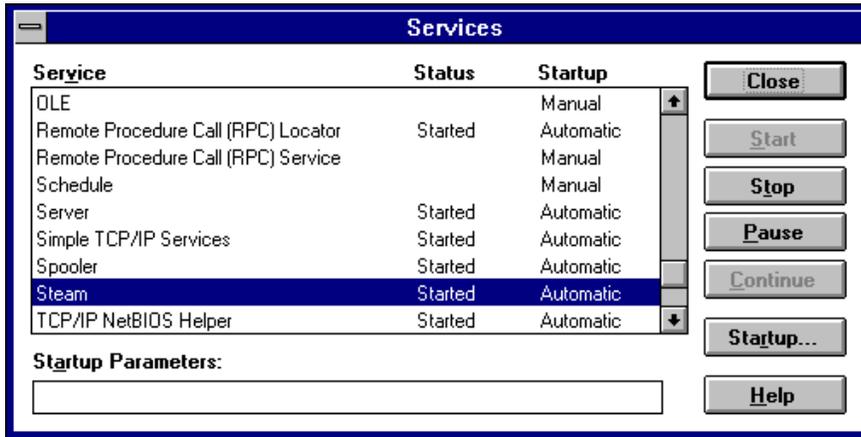
8. Click Close.

NOTE

Unless you have a DNS server, you will need to modify the HOSTS file in order to map IP addresses to host names. This file is located at: drive_letter:\WINNT\System32\drivers\etc.   This file is hidden and is "Read Only."

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9. Before modifying the HOSTS file, remove the "Read Only" attributes. Follow the samples in the HOSTS file to map the IP addresses to all servers and clients on the network.

This completes the installation of the agent on a host. Repeat the procedures in Sections 4.3 to install the agent on the second host.