

# ***Compaq StorageWorks***<sup>TM</sup>

## **Getting Started RAID Array 3000 for Microsoft Windows**

Installation Guide

Fourth Edition (January 2001)  
Part Number AA-RACZD-TE  
**Compaq Computer Corporation**

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# About This Guide

## Purpose and Scope

This guide is designed to provide information on operation, troubleshooting and for future upgrades for the Compaq *StorageWorks™ Getting Started RAID Array 3000 for Microsoft Windows Installation Guide*.

## Intended Audience

This document is written for installers and operators.

## Document Structure

This guide contains the following information:

### **Chapter 1: Getting Started**

- Inventory the Storage System and Platform Kit Components
- Verify User-Supplier Hardware and Software (System Requirements)
- Install and Configure Your RAID Array 3000

**Chapter 2: Unpacking and Setting Up the RAID Array 3000 Pedestal**

- Site Preparation
- Unpacking the RAID Array 3000
- Preparing the Pedestal for Operation

**Chapter 3: Unpacking and Setting Up the RAID Array 3000 Controller Shelf**

- Unpacking and Installing the Controller Shelf
- Preparing the Controller Shelf for Operation
- Installing the Controller Shelf in a Cabinet
- Connecting Cables
- Charging the UPS Battery

**Chapter 4: Installing the Host Adapter**

- SWXA3-BD SCSI Host Adapter Description
- Before you Install SWXA3-BD SCSI Host Adapter
- Installing the SWXA3-BD SCSI Host Adapter
- Connecting the SWXA3-BD to the RAID Array 3000 Subsystem

**Chapter 5: Preparing Your Host for Use with Your RAID Array 3000**

- Windows NT Preparation
- Windows 2000 Preparation

**Chapter 6: Installing Command Console Client and Creating Your First Virtual Disk**

- Procedure Summary
- Installing the Command Console
- Launching Command Console Client
- Establishing a Serial Connection
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- Configuring your RAID Array 3000 for Dual Controller Operation
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**Chapter 7: Completing Your Storage Configuration Under Windows NT**

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**Chapter 9: Communicating Over a Network with A Windows NT and Windows 2000**

- Agent
- Client
- Before you Start
- Install the Agent
- Configuring the HSZ22 Agent on Windows NT
- Adding Storage Subsystems and Their Hosts to the Network

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- Some Graphics Do Not Scale Well with Large Fonts
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- HS-Series Agent Interaction
- Troubleshooting Connection Problems
- Windows NT Event Logging
- Troubleshooting with a SCSI Connection

## Related Documents

In addition to this guide, the following documentation can be useful:

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<b>Document Title</b>	<b>Part Number</b>
RAID Array 3000 Subsystem Second Controller Option Installation Guide	EK-SM3KC-IG.E01
RAID Array 3000 Cluster Solutions for Microsoft Windows Installation Guide	EK-NT03K-IG.C01
Command Console V2.2 for the RAID Array 3000 (Pedestal and Rack Mount Models) User's Guide	AA-RBF2C-TE
RAID Array 3000 Controller Shelf Hardware User's Guide	EK-SMCPQ-UG.D01
RAID Array 3000 Pedestal Storage Subsystem Hardware User's Guide	EK-SMCP0-UG.C01

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## Text Conventions

This document uses the following conventions to distinguish elements of text:

<b>Keys</b>	Keys appear in boldface. A plus sign (+) between two keys indicates that they should be pressed simultaneously.
USER INPUT	User input appears in a different typeface and in uppercase.
<i>FILENAMES</i>	File names appear in uppercase italics.
Menu Options, Command Names, Dialog Box Names	These elements appear in initial capital letters.
COMMANDS, DIRECTORY NAMES, and DRIVE NAMES	These elements appear in uppercase, unless case sensitive.
Type	When you are instructed to <i>type</i> information, type the information <b>without</b> pressing the <b>Enter</b> key.
Enter	When you are instructed to <i>enter</i> information, type the information and then press the <b>Enter</b> key.

## Symbols in Text

The following symbols are found in the text of this guide to indicate different types of information.



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

---



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

---

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

---

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

## Symbols on Equipment

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



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

---



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

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

---



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

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

---



This symbol on an RJ-45 receptacle indicates a Network Interface Connection.

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

---



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

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

---



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

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

---



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

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

---

## Rack Stability



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

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

## Getting Help

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

### Compaq Technical Support

In North America, call the Compaq Technical Phone Support Center at 1-800-OK-COMPAQ. This service is available 24 hours a day, 7 days a week. For continuous quality improvement, calls may be recorded or monitored.

Outside North America, call the nearest Compaq Technical Support Phone Center. Telephone numbers for worldwide Technical Support Centers are listed on the Compaq website. Access the Compaq website:

<http://www.compaq.com>

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

- Technical support registration number (if applicable)
- Product serial number
- Product model name and number
- Applicable error messages
- Add-on boards or hardware
- Third-party hardware or software
- Operating system type and revision level

### **Compaq Website**

The Compaq website has information on this product. Access the Compaq website:

<http://www.compaq.com/storage>

### **Compaq Authorized Reseller**

For the name of your nearest Compaq authorized reseller:

- In the United States, call 1-800-345-1518.
- In Canada, call 1-800-263-5868.
- Elsewhere, see the Compaq website for locations and telephone numbers.



# *Chapter 1*

## **Getting Started**

This chapter provides an overview for preparing and installing the RAID Array 3000 Pedestal or Rackmount Controller Shelf for Windows NT and Windows 2000.

Thank you for purchasing a StorageWorks RAID Array 3000 Storage System. You should have received the following:

- RAID Array 3000 for Windows NT - PCI platform kit (QB-5TWAE-SA).
- RAID Array 3000 Storage System Pedestal (DS-SWXRA-GA/GC/GJ) or Rackmount Controller Shelf version (DS-SWXRA-GH/GK).

## Inventory the Storage System and Platform Kit Components

The Windows NT platform kit contains:

- CD-ROM RAID Array 3000 V1.3 for Microsoft Windows (AG-RAD1D-BE)
- Release Notes containing important information not contained in other documents (AA-RAD0D-TE)
- This Getting Started guide (AA-RACZD-TE)
- *Command Console V2.2 for the RAID Array 3000 (Pedestal and Rack Mount Models) User's Guide* (AA-RBF2C-TE)
- Software Product Description for the RAID Array 3000

The RAID Array 3000 Storage System contains:

- StorageWorks Storage Enclosure
- *RAID Array 3000 Pedestal or Controller Shelf Hardware User's Guide*
- One StorageWorks RAID Array 3000 controller (HSZ22) with 16MB cache
- Serial cable (9-pin serial) for connecting the serial port of the RAID controller to the serial port of your PC
- Uninterruptable Power Supply (UPS)

**NOTE:** The UPS is a component of the RAID Array 3000 storage system that protects your data from loss in case of a power failure. The UPS is not to be used for any other application when used in the RAID Array 3000 storage system.

- Two power cables
- Enclosure keys
- SCSI cable
- Technology adapter cable 68-pin HD to VHDCI cable adapter (BN38-0B)

## **Verify User-Supplied Hardware and Software (System Requirements)**

The StorageWorks RAID Array 3000 Storage System requires the following user-supplied hardware and software:

- A PCI system with an available PCI slot
- The associated system hardware manuals
- Appropriate tools to service your computer
- The Windows NT operating system – Version 4.0 or Windows 2000
- Compaq SWXA3-BD adapter for your PCI systems

## Install and Configure Your RAID Array 3000

Use the following steps to assist you during the installation process. They summarize the steps to install, configure and create your first virtual disk. Detailed procedures are provided in this guide.

1. Back up your system and locate user-supplied hardware.
2. Plan your configuration. Determine the type of storage containers you require. The RAID Array 3000 supports single disks Just a Bunch of Disks (JBODs), StripeSets (RAID 0), MirrorSets (RAID 1), Striped MirrorSets (RAID 0+1), striped with a fixed parity drive (RAID 4) and striped with a floating parity drive (RAID 5). Use the configuration record sheets provided in Appendix A to record your configuration.
3. Unpack and locate the RAID Array 3000 subsystem, UPS, UPS communication cable and AC power cord.
4. Connect a serial line from the computer system you will use to monitor and manage your RAID Array 3000 to serial port CTR TOP. This port is connected to the controller installed in the top controller slot.
5. Install the host SCSI adapter and software driver in your computer system and connect the host adapter to the RAID Array 3000 subsystem. The RAID Array 3000 connects to the SCSI host adapter card by means of a BN37A-05 SCSI cable, and a VHDCI to 68-pin HD adapter cable (BN38-0B).
6. Install Command Console Client software for Windows NT and Windows 2000.
7. Establish communications with your RAID Array 3000 over the serial line.
8. Configure your RAID Array 3000 controller and create your first virtual disk.
9. Complete the installation under Windows NT and Windows 2000.
10. Install Command Console Agent to enable network communication with your RAID Array 3000.

## *Chapter* **2**

# **Unpacking and Setting Up RAID Array 3000 Pedestal**

This chapter describes the site preparation and unpacking procedures for the RAID Array 3000 Pedestal storage system. It also describes the installation of the disk drives, cables, the Uninterruptable Power Supply (UPS), and how to connect the serial interface between the host computer and the RAID Array 3000 controller (HSZ22).

## Site Preparation

Before installing the enclosure, make sure that adequate space is available in front of the enclosure for opening the front door (10 in/25.4 cm clearance). See Figure 2-1 for specific space requirements.

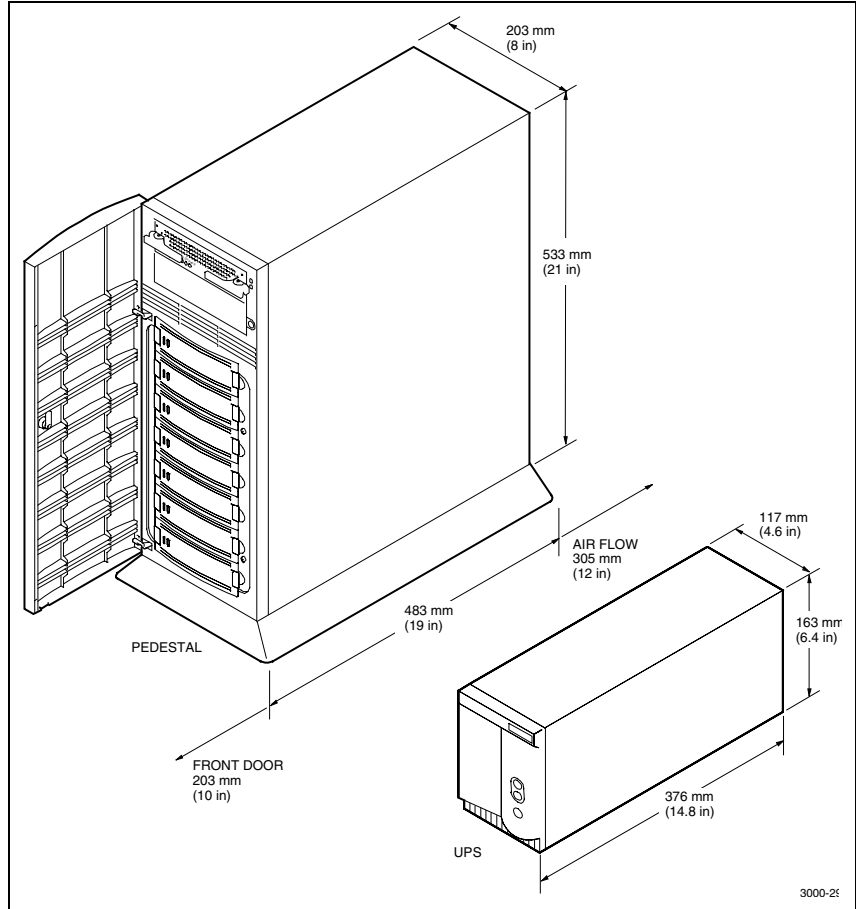


Figure 2-1. Minimum installation clearance measurements

## Unpacking the RAID Array 3000

The shipping containers provide maximum protection for the subsystem and all components. Compaq recommends that you unpack the subsystem in the installation area.

**NOTE:** Before unpacking the equipment, inspect the shipping carton for signs of external damage. Report any damage to the local carrier and to your sales representative.

See Figure 2-2 and complete the following procedure to unpack the subsystem:

1. Orient the shipping container as shown.
2. Open the container and remove the subsystem and packing material.
3. Remove the top foam blocks.
4. Remove the door.
5. Remove the UPS from the side compartment.
6. Remove the subsystem.
7. Replace all packing material in the shipping container and store for future use.

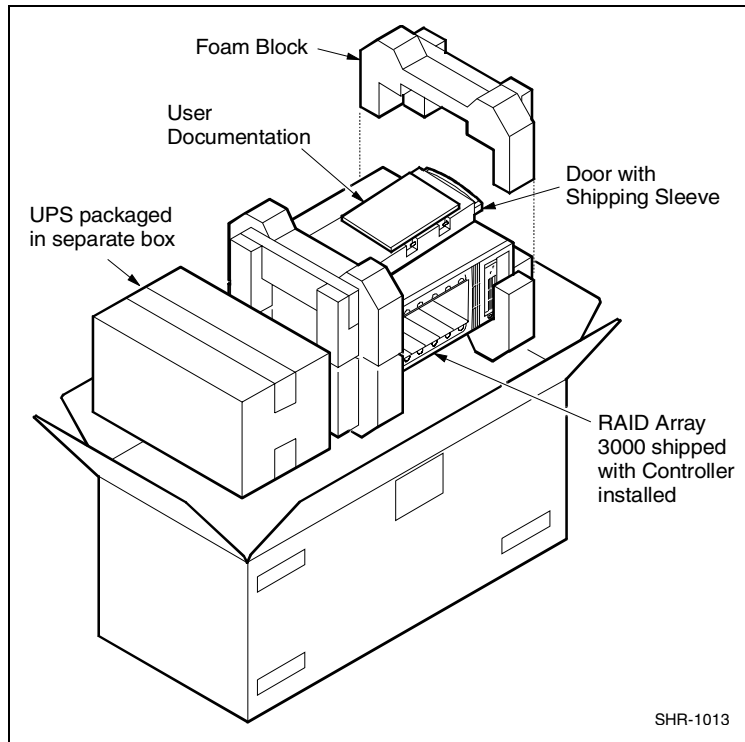


Figure 2-2. Unpacking the RAID Array 3000 Pedestal

## **Preparing the Pedestal for Operation**

Preparing the RAID Array 3000 for operation involves the following procedures:

1. Mounting the base.
2. Installing the door.
3. Installing the disk StorageWorks Building Blocks (SBBs).
4. Connecting the PC serial interface cable.
5. Connecting the AC power cords.
6. Charging the UPS battery.
7. Installing the SCSI host adapter and connecting the SCSI bus cables.  
See Chapter 4 “Installing the Host Adapter.”

### **Mounting the Base**

Mount the stabilizing base to the subsystem as follows:

1. Place the subsystem on its top.
2. Align the base with the bottom of the subsystem as shown in Figure 2–3.
3. Install the four hex-head 6-32 screws through the base into the subsystem and tighten the screws using a 3/16 inch hex-head screwdriver.
4. Set the subsystem on its base and continue the installation process.



## Installing the Door

Install the door on the subsystem as follows:

1. Insert the two pivots on the left inside of the door into the receptacles on the left front of the enclosure (one just above the SBBs, one just below).
2. Close and latch the door (you can lock it with the key provided).

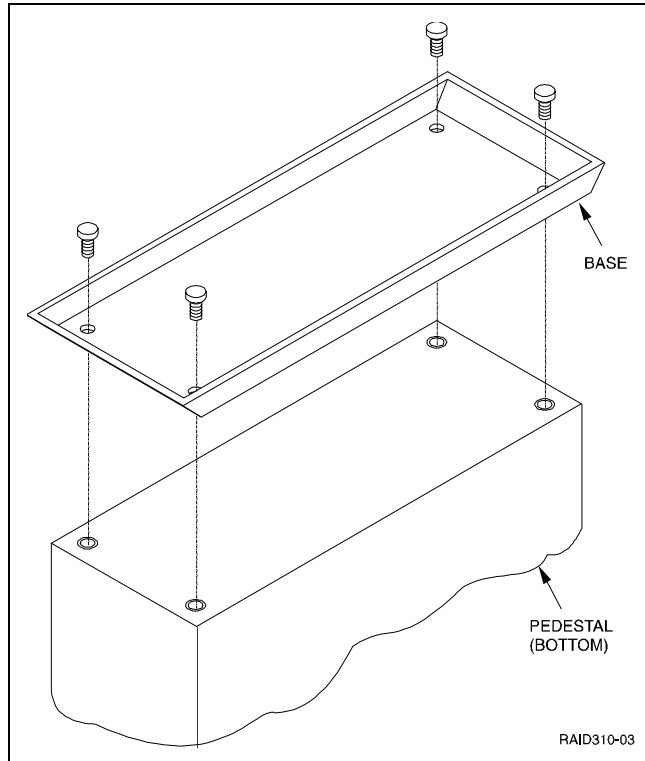


Figure 2-3. Mounting the base

## Installing the Disk SBBs

To install a disk SBB, hold it in both hands, insert it into the guide slots, and firmly push it into the shelf until the mounting tabs snap in place. Figure 2-4 shows a split-bus configuration and shows the SCSI bus port and ID assignments in the enclosure.

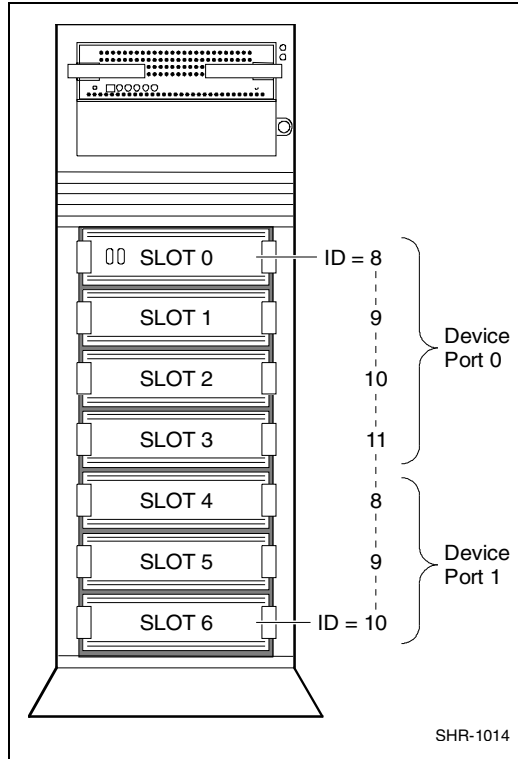


Figure 2-4. StorageWorks SCSI bus port and SCSI ID assignments

## Connecting the PC Serial Interface Cable

You must make a serial connection to the RAID controller to create your first virtual disk. This disk is required to communicate to your RAID Array 3000 over a network or SCSI bus. The serial cable is 16.4 feet (5m) long and is labeled 17-04730-01. Do the following steps to connect the PC to the controller:

1. Locate the serial cable that came with the RAID subsystem. It has 9-pin female, serial connectors on each end.
2. Plug one end of the serial cable into the 9-pin serial port on a PC.
3. Plug the other end of the cable into the Controller 1 port on the RAID Array 3000 (Figure 2-5). The control ports are labeled CTR TOP (configuration port for the controller installed in the top controller slot) and CTR BOTTOM (configuration port for the second controller slot).
4. Note which PC serial port you use (COM1 or COM2 for example); you will need that information to establish a serial connection between your PC and the RAID Array 3000 controller.

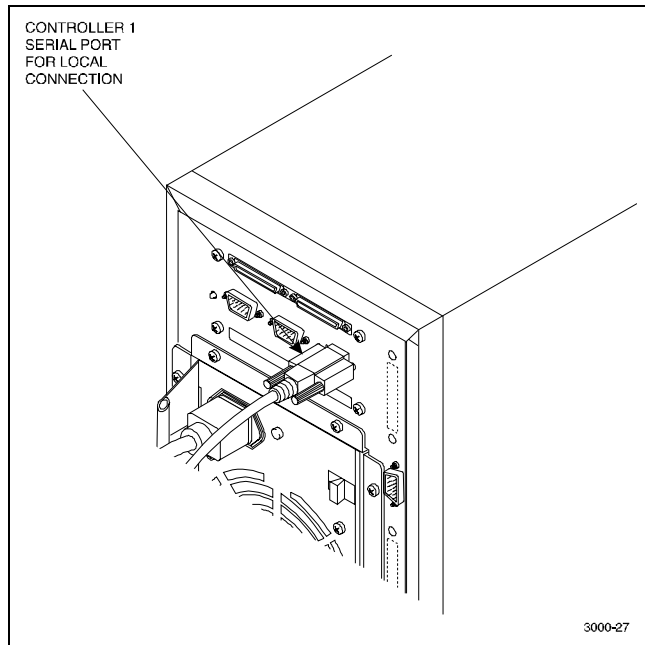


Figure 2-5. Connecting the serial interface

## Connecting the AC Power Cords

The subsystem contains two identical power supplies that provide redundant power to the RAID Array 3000. Each supply is equipped with an AC power receptacle for connection to a 125 or 230 VAC power source. The power supplies automatically sense the voltage level and will work with either voltage.

Two power cords are required to operate and provide redundant power to the subsystem. Table 2-1 lists the Compaq power cords available for the subsystem. Since these cords are country-specific, ensure that your cords match those listed in Table 2-1 for your installation.

Make sure the power button switch on the top right front of the enclosure is in the off position (button out). Obtain the correct power cords for your AC power source and connect them between the AC receptacles on the power supplies and the AC outlets. Be sure to connect the UPS to the other power supply (Figure 2-6) to prevent the loss of storage data in the event of a failure of the AC power source. Connect the UPS sensing cable from Comm Port 1 on the UPS to the UPS connector on the back of the RAID Array 3000.

Also, make sure that the UPS are the correct type for your voltage source. The international UPS supports 220 VAC, and has the part number 4N-AEADA-FC, while the North American model supports 125 VAC, and has the part number 4N-AEADA-EC; the UPS cable is 6.6 feet (2m) long and has the part number 17-04729-01.

**NOTE:** You can begin configuring the RAID Array 3000 while the UPS is charging, but do not attempt to fully utilize the subsystem, with data transfers for example, before the UPS battery is fully charged.

**Table 2-1**  
**Recommended Country-Specific AC Power Cords**

<b>Country</b>	<b>Voltage</b>	<b>Plug Type</b>	<b>Order No.</b>
Australia	250 VAC	AS3112-1981	BN19H-2E
C. Europe	250 VAC	CEE 7/7 (Schuko)	BN19C-2E
Denmark	250 VAC	Afsnit 107	BN19K-2E
India	250 VAC	BS 546	BN19S-2E
Ireland	250 VAC	BS 1363	BN19A-2E
Israel	250 VAC	SI 32	BN18L-2E
Italy	250 VAC	CEI 213-16/VII	BN19M-2E
Japan	125 VAC	NEMA 5-15	BN27S-03
N. Zealand	250 VAC	AS3112-1981	BN19H-2E
S. Africa	250 VAC	BS 546	BN19S-2E
Switzerland	250 VAC	SEV 1011	E0-BN19H-2E
U. K.	250 VAC	BS 1363	BN19A-2E
U. S.	125 VAC	NEMA 5-15	BN27S-03

Figure 2-6 shows how to connect UPS and power cables.

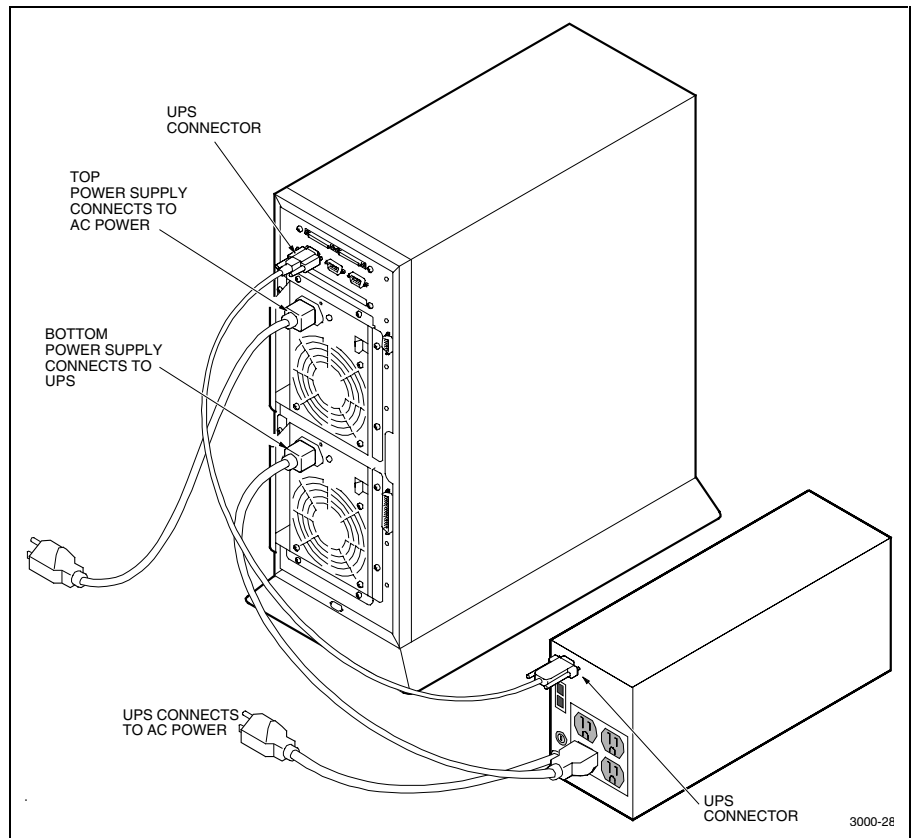


Figure 2-6. Connecting the UPS and power cables

## Charging the UPS Battery

Connect the UPS to the power source and place the On/Off switch in the **On** position. UPS battery recharge time is from 4 to 6 hours. You can begin configuring the RAID Array 3000 while the UPS is charging, but do not attempt to fully utilize the subsystem, with data transfers for example, before the UPS battery is fully charged. For UPS operating instructions, refer to the UPS User's Guide packed with the UPS. Observe all Cautions and Warnings in the UPS User's Guide.

## Chapter 3

# Unpacking and Setting Up RAID Array 3000 Controller Shelf

This chapter contains unpacking and general setup information for the RAID Array 3000 Controller Shelf. This information must be used in conjunction with the *RAID Array 3000 Controller Shelf Hardware User's Guide* and the installation guide for the BA356 device expansion shelf to properly install the Controller Shelf in your storage system.

## Unpacking and Installing the Controller Shelf

The shipping container provides maximum protection for the shelf and all components. We recommend that you unpack the unit in the installation area.

**NOTE:** Before unpacking the equipment, inspect the shipping carton for signs of external damage. Report any damage to the local carrier and to your sales representative.

Open and unpack the controller shelf shipping container. Remove the plastic bag and carefully place the shelf on a flat surface (Figure 3–1). Replace all packing material in the shipping container and store for future use.

## Preparing the Controller Shelf for Operation

Preparing the RAID Array 3000 Controller Shelf for operation involves:

1. Mounting the shelf in your RETMA or metric style rackmount cabinet.
2. Connecting cables.
3. Charging the Uninterruptable Power Supply (UPS) battery.

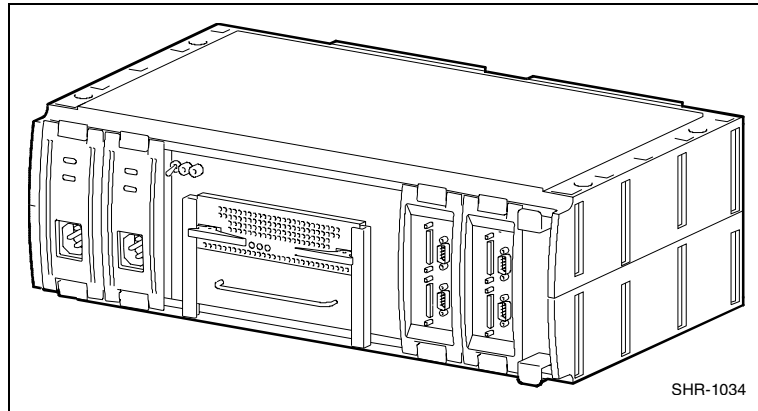


Figure 3-1. StorageWorks RAID array 3000 controller shelf

## Installing the Controller Shelf in a Cabinet

The controller shelf is designed to mount in a standard 19 inches RETMA or metric style cabinet. The shelf, along with up to four BA356 device expansion shelves and the UPS, is installed in the cabinet to form your complete storage system. In a typical storage installation, the shelf is installed at the bottom of the cabinet directly above the UPS. The device expansion shelves are then mounted above the shelf. These locations in the cabinet are recommended to ensure proper cable connections.

See Chapter 3 “Installation and Maintenance” of the *RAID Array 3000 Controller Shelf Hardware User’s Guide* for detailed information describing the controller shelf installation process. This document contains the procedures needed to properly mount the shelf brackets for both cabinet styles.



See Chapter 3 “Installation and Maintenance” of the *RAID Array 3000 Controller Shelf Hardware User’s Guide* for the SCSI bus and ID addresses of the drives in the BA356 device expansion shelves. The target SCSI bus ID assignments for a one, two, three, and four Device Expansion Shelves are also shown.

## Connecting Cables

The cable connections to complete the controller shelf installation consist of:

- Serial control cable connection between the controller shelf host I/O module and the maintenance PC
- SCSI cable connections between the controller shelf device I/O modules and the SCSI connectors on the device expansion shelf personality I/O Modules
- AC power cord connections between the AC power source, the UPS, and the controller and device expansion shelves

The cable connection information is covered in detail in Chapter 3 “Installation and Maintenance” of the *RAID Array 3000 Controller Shelf Hardware User’s Guide*. This manual also contains specific cable installation procedures for a controller shelf and up to four expansion shelves.

## Charging the UPS Battery



**CAUTION:** To prevent possible damage to the equipment, the input voltage level of the UPS must be set to your specific line voltage before proceeding. Refer to the UPS manual and set the input level to your AC power sources.

---

See the AC power wiring diagram in the cabling section of Chapter 3 “Installation and Maintenance” of the *RAID Array 3000 Controller Shelf Hardware User’s Guide* to connect the UPS to the power source and the individual shelves in your RAID Array 3000 storage system installation. This diagram shows the gray and black power cord connections, along with a jumper connection that must be made between the UPS and the host I/O module in the controller shelf.

### **3-4** *Getting Started RAID Array 3000 for Microsoft Windows Installation Guide*

Place the UPS On/Off switch in the **On** position. UPS battery recharge time is from 4 to 6 hours. You can begin configuring the RAID Array 3000 while the UPS is charging, but do not attempt to fully utilize the storage system with data transfers before the UPS battery is fully charged. I/O transfers during a UPS battery charging cycle could result in a loss of data. For example, a device drive shelf could fail during a transfer due to insufficient battery current.

For UPS operating instructions, refer to the UPS User's Guide packed with the UPS. Observe all Cautions and Warnings in the UPS User's Guide.

## *Chapter* **4**

# **Installing Host Adapter**

In preparing your array for first time use, you need to connect your system to the RAID subsystem through a host adapter board. This chapter provides instructions for preparing, installing, and connecting the host adapter.

### **SWXA3-BD SCSI Host Adapter Description**

The host adapter qualified for use with your StorageWorks RAID Array 3000 for Windows NT is the SWXA3-BD Ultra-Wide Differential SCSI Host Adapter, shown in Figure 4-1. See Table 4-1 for the exact specifications of the qualified host adapter.

**Table 4-1**  
**RAID Array 3000 Qualified Adapter**

PCI Adapter	BIOS Revision	Windows NT V4.0 Driver
SWXA3-BD	2.11	4.0
		Windows 2000 Driver
SWXA3-BD	2.11	5.0.2144.1

The adapter connects your host computer to the StorageWorks RAID Array 3000 through a BN38E-0B Technology Adapter cable and a BN37A-05 SCSI cable.

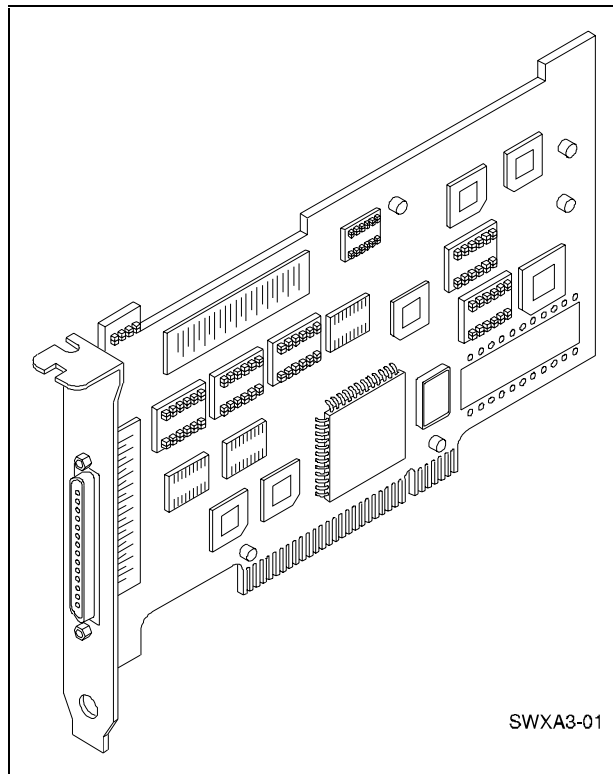


Figure 4-1. SWXA3-BD differential host adapter

## Before You Install SWXA3-BD SCSI Host Adapter

You need the following items before you begin:

- The host adapter (SWXA3-BD)
- Your computer system hardware manual for reference information
- Host adapter Installation Guide
- Appropriate tools to access your computer
- Technology Adapter Cable (BN38E-0B) — HD68 to VHDCI
- The SCSI cable (BN37A-05) — VHDCI VHDCI
- Floppy diskette labeled ADAPTEC 7800 Family Driver Set for Windows NT (contains the AIC 78xx.SYS driver)
- CD-ROM RAID Array 3000 V1.3 for Microsoft Windows (AG-RAD1D-BE)

Before installing the adapter in your host system, take precautions to protect the board from electrostatic discharge.



**CAUTION:** To protect the board from static discharge, always use proper ESD procedures. In addition, do not remove the board from its anti-static protective cover until you are ready to install the adapter.

---

The major steps for installing the SCSI host adapter include:

- Performing the physical installation
- Connecting the SWXA3-BD to the RAID Array 3000 subsystem
- Configuring your host adapter (see Chapter 5 “Preparing Your Host for Use with Your RAID Array 3000”)
- Installing the SWXA3-BD/Ultra PCI miniport device driver (see Chapter 5 “Preparing Your Host for Use with Your RAID Array 3000”)

After installing the host adapter you then:

- Install the RAID WNT device driver (see Chapter 5 “Preparing Your Host for Use with Your RAID Array 3000”)

## Installing the SWXA3-BD SCSI Host Adapter

To install the host adapter:

1. Shut down the operating system running on your host computer.
2. When the operating system has shut down, turn off the power to the host computer and all attached peripherals. Then, disconnect power cables from the host computer.



**WARNING:** Failure to remove power from the host computer and peripherals can introduce a personal hazard, or can result in damage to the host computer or loss of stored data.

---

3. Open the computer to gain access to the motherboard. Refer to your computer system manual for assistance in completing this procedure.
4. Locate an available PCI expansion slot, and remove the blank filler panel corresponding to that expansion slot at the rear of the system. Retain the screw that held it in place. You need the screw to secure the SWXA3-BD adapter as specified in step 5 of this procedure.

5. Install the SWXA3–BD host adapter board in a PCI slot in your system, as shown in Figure 4-2. Ensure that the board end plate metal tab aligns in the system chassis opening properly, otherwise the adapter will not seat correctly. Secure the board to the system chassis with the screw you removed from the blank filler panel.
6. Replace the computer cover.

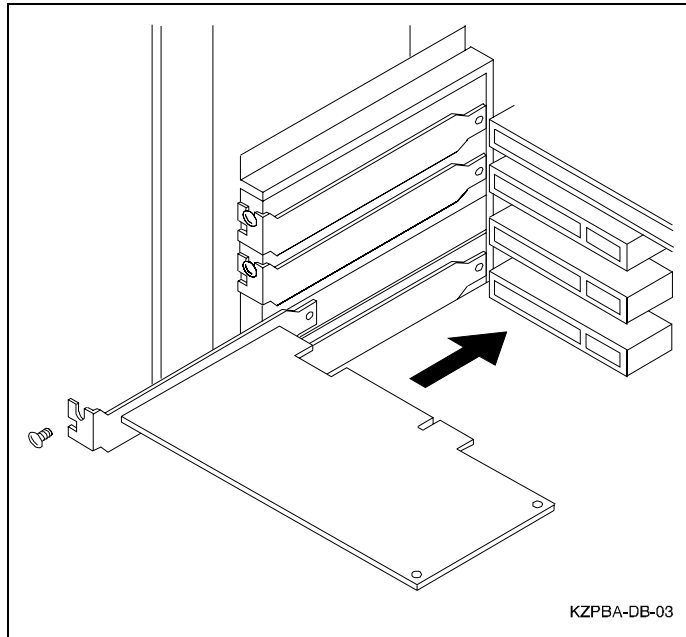


Figure 4-2. Installing the SWXA3–BD host adapter

## Connecting the SWXA3-BD to the RAID Array 3000 Subsystem

Connect the SWXA3-BD host adapter to the RAID Array 3000 as follows:

1. Connect the large, thumbscrew-equipped connector on the BN38E-0B Technology Adapter cable to the SWXA3-BD host adapter connector as shown in Figure 4-3.

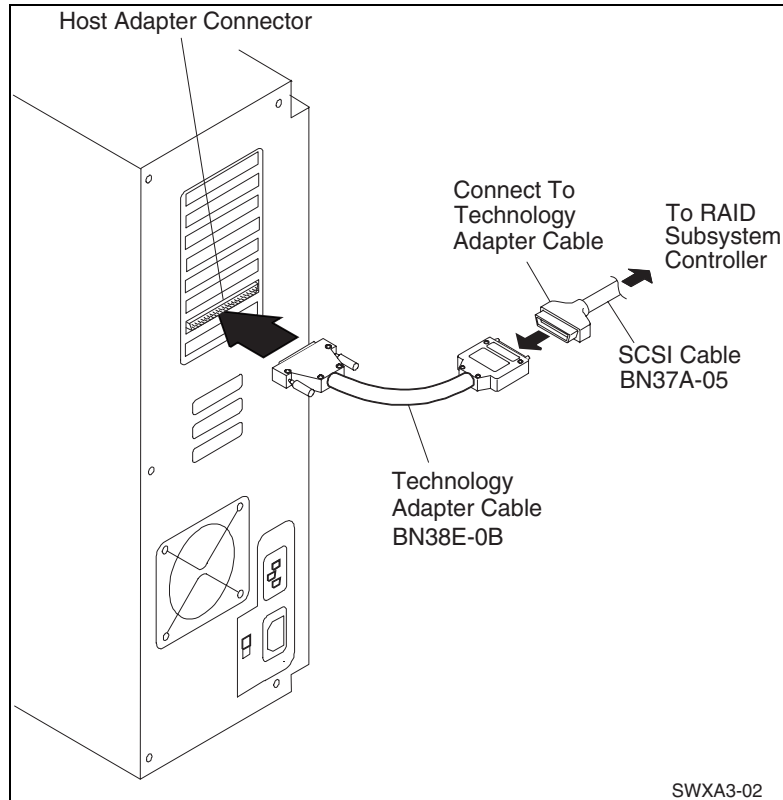


Figure 4-3. Connecting BN38E-0B technology adapter cable to the host adapter and to the SCSI cable

2. Connect the small connector on the BN38E-0B Technology Adapter cable to the connector on one end of the BN37A-05 SCSI cable.

**NOTE:** Make sure you secure the two connectors with the screws provided.



3. Connect the other end of the SCSI cable to the RAID Array 3000 Host Port 0 or Host Port 1 connector. Figure 4-4 shows a cable connected to both ports.

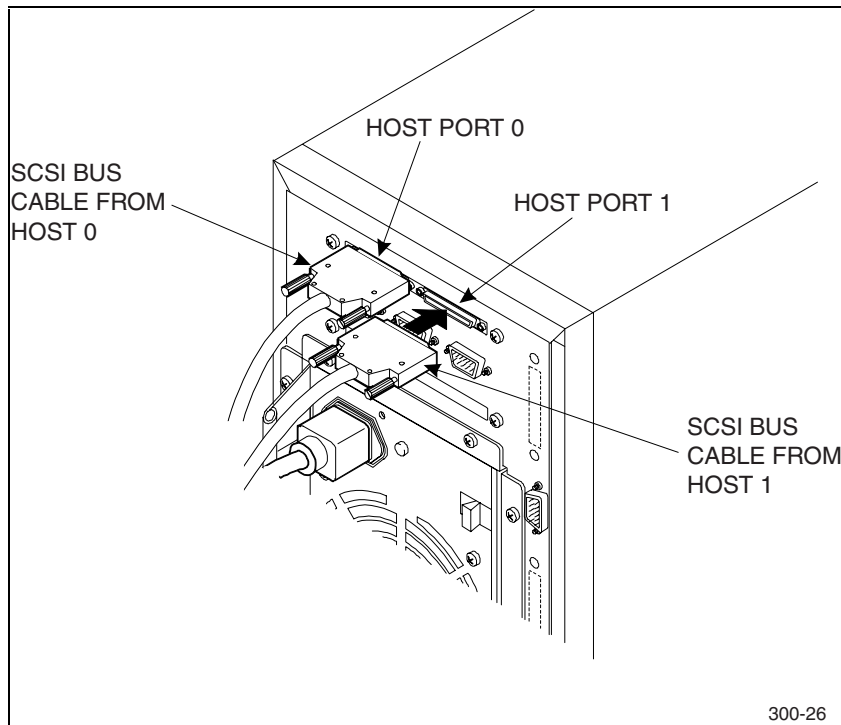


Figure 4-4. Connecting the SCSI bus cables



## Chapter 5

# Preparing Your Host for Use with Your RAID Array 3000

This chapter contains instructions for configuring your host adapter, installing the PCI Miniport Device Driver, and installing the Hszdisk driver in your host system.

### Windows NT Preparation

To Configure the SWXA3–BD Host Adapter:

1. Turn on the power to the RAID Array 3000 by pushing in the button switch on the top right front of the enclosure. Make sure the power indicator on the top right front of the enclosure lights and the fans start to turn.
2. Boot your computer, and when you see the prompt to access the SWXA3-BD (2944UW) BIOS setup, and then press the **Ctrl+A** keys. Watch closely, the prompt appears quickly at the bottom of the screen during the boot routine.
3. Select Configuration/View Host Adapter Settings and then press the **Enter** key.
4. Press the **F6** key to set the adapter to its default settings.
5. Select SCSI Device Configuration and then press the **Enter** key.
6. Verify that Initiate Wide Negotiation settings are set to Yes.

**NOTE:** Keeping the 2944UW BIOS enabled might interfere with the system boot path. If you are not using the RAID Array 3000 as the boot device for Windows NT, you can disable the 2944UW BIOS; to do so set Host Adapter BIOS to Disabled.

7. Save the configuration and exit the BIOS setup.

To install the SWXA3–BD/Ultra PCI miniport device driver:

**NOTE:** Your adapter package includes the required adapter-specific software. Use only the adapters and drivers supplied with the adapter kit since these are tested and certified to function with the RAID Array 3000 Controller (HSZ22).

1. Open Control Panel.
2. Open SCSI Adapters from the Control Panel.
3. Select **Drivers** tab and then click **Add**.
4. Select **Have Disk**.
5. Insert the diskette labeled Adaptec 7800 family driver set into the floppy diskette drive.
6. Specify the path to the NT driver, type: **A:\WINNT4\_0** (for WINNT 4.0) and click **OK**.
7. Select Adaptec AHA–294x/AHA–394x or AIC–78xx PCI SCSI Controller from the SCSI Adapter List and click **OK**.
8. At this point the system prompts you to reboot. Ignore the instruction and proceed to section “Installing the RAID Device Driver (HSZDISK.SYS driver)”. Reboot after HSZDISK.SYS has been installed.

To install the HSZDISK.SYS driver:

- Locate the CD-ROM disk labeled RAID Array 3000 Solution SW for Windows NT. It contains the HSZDISK.SYS driver.
- The HSZDISK.SYS driver is installed using the HSZ install utility. The HSZ utility installs the driver, checks the event log for miniport and class driver errors, and also checks the SCSI adapter driver version.

Install the HSZDISK.SYS driver by performing the following steps:

1. Insert the CD-ROM into your CD-ROM drive.
2. Run File Manager or Windows Explorer.
3. Navigate to the folder: CD\DRIVERS\HZINSTALL\
4. Double-click **Setup**.
5. Follow the instructions in the Setup program to complete the installation; the installation process copies the driver into the correct subdirectory and creates the necessary registry entries.
6. Reboot the system.

## Windows 2000 Preparation

To configure SWXA3–BD host adapter:

1. Turn on the power to the RAID Array 3000 by pushing in the button switch on the top right front of the enclosure. Make sure the power indicator on the top right front of the enclosure lights and the fans start to turn.
2. Boot your computer, and when you see the prompt to access the SWXA3-BD (2944UW) BIOS setup, press the **Ctrl+A** keys. Watch closely, the prompt appears quickly at the bottom of the screen during the boot routine.
3. Select Configuration/View Host Adapter Settings and then press the **Enter** key.
4. Press the **F6** key to set the adapter to its default settings.
5. Select SCSI Device Configuration and then press the **Enter** key.
6. Verify that Initiate Wide Negotiation settings are set to Yes.

**NOTE:** Keeping the 2944UW BIOS enabled might interfere with the system boot path. If you are not using the RAID Array 3000 as the boot device for Windows 2000, you can disable the 2944UW BIOS; to do so set Host Adapter BIOS to Disabled.

7. Save the configuration and exit the BIOS setup.

To install the SWXA3-BD device driver:

**NOTE:** Your adapter package includes the required adapter-specific software. Use only the adapters and drivers supplied with the adapter kit since these are tested and certified to function with the RAID Array 3000 Controller (HSZ22).

Windows 2000 discovers “new hardware” on bootup. Follow the prompts displayed by “New hardware discovered Wizard”. Windows 2000 will identify and install the driver.

1. Follow the instructions in the Setup program to complete the installation; the installation process copies the driver into the correct subdirectory and creates the necessary Registry entries.
2. From Computer Management click Rescan Disks. All devices on the RA3000 subsystem will be identified in the Disk Management Window.





## Chapter **6**

# Installing Command Console Client and Creating Your First Virtual Disk

This chapter contains instructions on how to install the Client component of Command Console for Windows NT and Windows 2000. When you install the Command Console Client. You will also be installing the client for the HSZ22 controller. The device-specific Client provides the Storage window. If you are installing the Client with a network connection, you must also install the individual Agent for each system.

### Procedure Summary

- Install the Command Console software
- Launch the Command Console Client
- Establish communications with the controller over the serial port
- Configure the RAID Array 3000 (HSZ22) controller for operation
- Create your first virtual disk

## Communication Methods

You can also connect and communicate with your RAID Array 3000 over a network or the SCSI bus. If you are planning to configure and monitor your RAID Array 3000 over a network or the SCSI bus, you must create at least one virtual disk on your subsystem using the serial port to establish a connection.

**NOTE:** A virtual disk must be established to both host ports to establish communications with the dual controllers.

SCSI Bus – A local connection method, connecting to your RAID Array 3000 over the SCSI bus, is covered in the *Command Console V2.2 for the RAID Array 3000 (Pedestal and Rack Mount Models) User's Guide*.

Network Connection – You can communicate with your RAID Array 3000 over a TCP/IP network. See Chapter 9 “Communicating Over a Network with Windows NT and Windows 2000” for details.

## Creating a Virtual Disk, Using the Serial Port

Serial Port Connection – This method is required to create your first virtual disk. This chapter shows you how to create a virtual disk over the serial port using Command Console Client software. The serial port method provides a local, direct connection to your array.

## Installing the Command Console

The minimum requirements to run Command Console Client are:

PC Requirements	X86 66 MHz, 16 MB memory, 2 MB free disk space, and CD-ROM drive
Operating System	Microsoft, Windows NT version 4.0, SP 4.0 or Windows 2000

Command Console Client installs from a CD-ROM disk using a standard Windows installation routine on a Windows platform. The program is self-extracting and stores Command Console Client into the directory C:\programfiles\Compaq\SWCC by default. During setup, you have the option to change the disk or directory location.

**NOTE:** If you are upgrading to a new version of Command Console Client, run the uninstall program and remove the old version before installing the new version.

**To install Command Console:**

1. Place the CD in the CD-ROM drive.
2. Run File Manager or Windows Explorer.
3. Navigate to the folder: drive\_letter:\SWCC\Client.
4. Double click **Setup**.
5. Follow the instructions in the setup program to complete the installation.
6. The first screen of the SWCC setup displays (Figure 6-1). Select the options to install the SWCC Navigation Window and also the HSZ22 Controller. This last option installs the HSZ22 device-specific Client for SWCC. Click **Next**

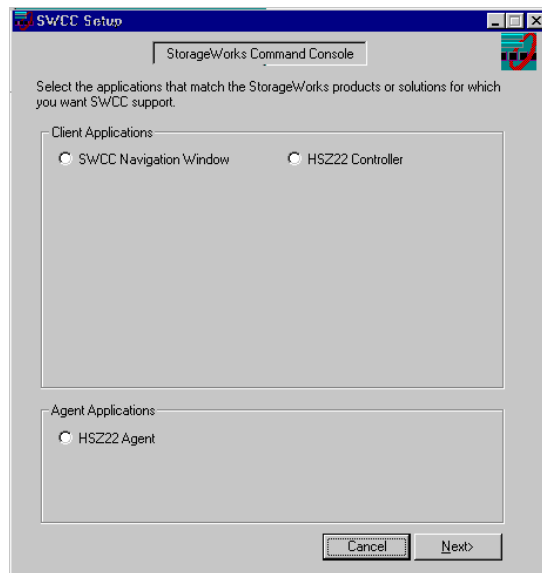


Figure 6-1. First SWCC Setup screen

7. The second SWCC Setup screen is displayed (Figure 6-2). The default installation directory can be changed with the **Browse** button. Click **Next**.

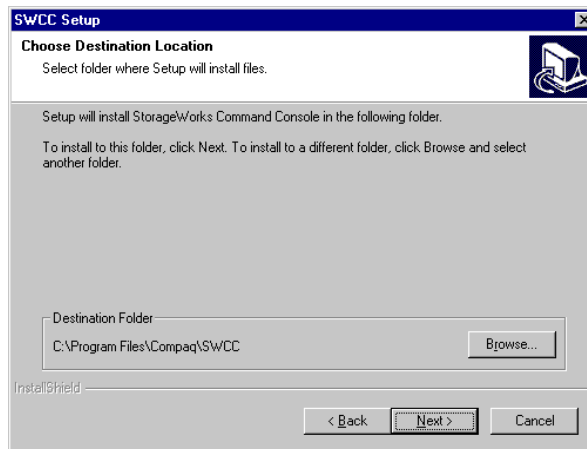


Figure 6-2. Second SWCC Setup screen for Client Installation

8. The Asynchronous Event Service (AES) starts and the following software installs:
  - a. Command Console Client
  - b. HSZ22 Client

For more information on AES, read the following section “Asynchronous Event Service.”

**NOTE:** After the Command Console Client is installed, you can access its Help, which provides detailed information on the configuration and use of Command Console. You can access Help for the Command Console by clicking Help in its window.

## Launching Command Console Client

To start Command Console from the Start Menu, double-click the StorageWorks Command Console name (Figure 6-3).

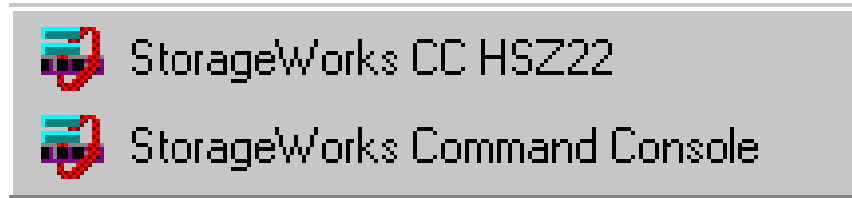


Figure 6-3. Command console client's start menu

The choices Client provides you with at startup are:

- **HSZ22 Storage Window:** Displays the Storage Window. This choice lets you monitor and configure one storage subsystem using Client's graphical user interface. All connection choices are provided: serial line, SCSI bus and network (TCP/IP).
- **StorageWorks Command Console:** Displays the Navigation Window. The Navigation Window is a network navigation tool used to manage and monitor storage subsystems over a TCP/IP network. This choice lets you monitor and configure one or many storage subsystems over a network using Client's graphical tools. See Chapter 9 "Communicating Over a Network with Windows NT and Windows 2000" for details.

## Establishing a Serial Connection

To create your first virtual disk, establish a serial cable connection from one of the PC's COM ports to the storage subsystem's CTR TOP or CTR BOTTOM configuration port. See section "Connecting the PC Serial Interface Cable" and proceed as follows:

1. Select the HSZ22 Storage Window.
2. When the Connection Choice dialog box appears, click the **Serial radio** button (Figure 6-4), then click **OK** to display the Serial Connection dialog box (Figure 6-5).



Figure 6-4. Connection choice dialog box

**NOTE:** To setup communications with both controllers you must configure virtual disk on each controller see "Configuring your RAID Array 3000 for Dual-Controller operation."

1. On the Serial Connection dialog box, from the drop-down menu, select the PC COM port your RAID Array 3000 controller is connected to, then click the **Connect** button to display the Storage Window (Figure 6–5). You are now connected to your storage system. The next step is to configure the controller.

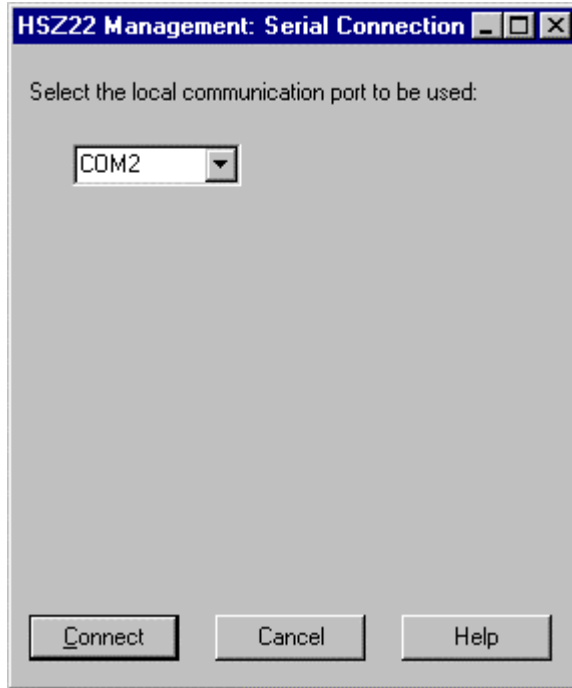


Figure 6-5. Serial connection dialog box for storage window

**NOTE:** To setup communications with both controllers you must configure virtual disk on each controller see “Configuring your RAID Array 3000 for Dual-Controller operation.”

The top windowpane displays the devices available to create a new virtual disk.

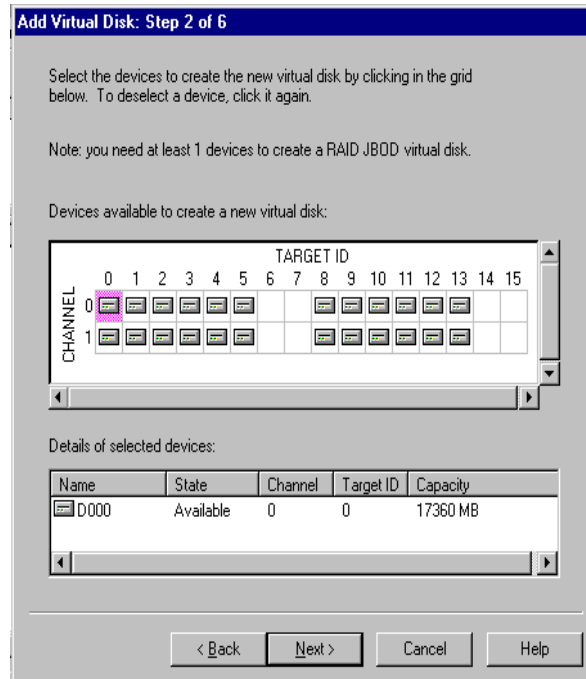


Figure 6-6. Storage window

The bottom windowpane shows the devices you have installed in the RAID Array 3000. On startup, Command Console finds installed disks and displays them in a grid by channel and SCSI ID number.

## Configuring a Single Controller

Your controller's operating parameters are stored in property sheets. Double-clicking on a controller icon in the Storage Window, or right clicking on the icon and selecting Properties, accesses controller property sheets. To access a sheet click its tab.

Changes in all fields cause a controller restart to place the changes in effect. The program prompts you for confirmation before it restarts your controller.



After you change a parameter that causes a controller restart, there is a delay of approximately 90 seconds while the controller reinitializes. If the controller does not communicate with Client after the restart delay period, press the controller's reset button on the front panel to manually restart it.

**NOTE:** In dual controller configuration you may need to remove and reinstall the controller.

1. Access the controller's property sheets by double-clicking the controller's icon in the Storage Window, the General controller properties sheet displays (Figure 6-7).

Each property sheet is displayed by clicking its tab. The RAID Array 3000 Controller has four property sheets: General, Host Ports, Environment, and Cache.

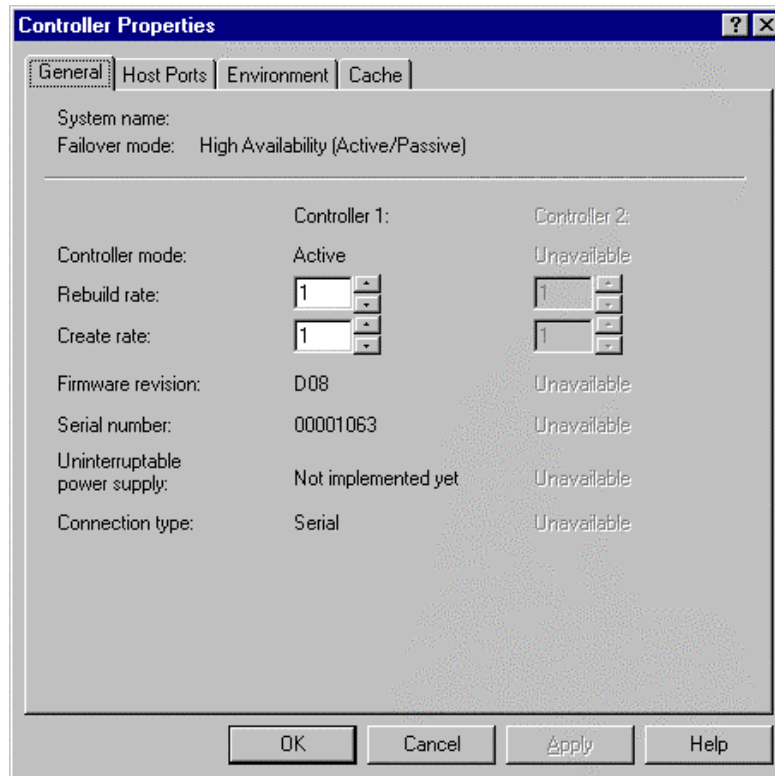


Figure 6-7. General controller properties tab

2. Click the **Host Ports** tab to display the host port operating parameters and set the host port operating parameters (Figure 6–8).

**NOTE:** Host Port mode does not currently display Windows 2000 selection, keep mode selection to Windows NT.

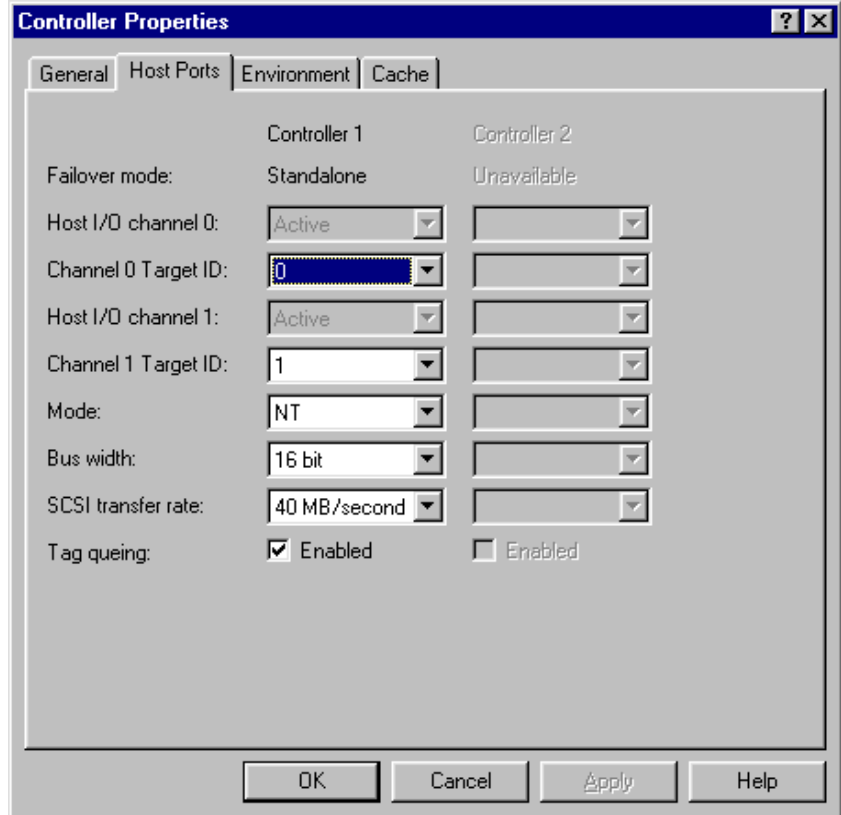


Figure 6-8. Host port controller properties tab

3. Click the **Environment** tab to verify that the system is operating within normal environmental parameters (Figure 6-9).

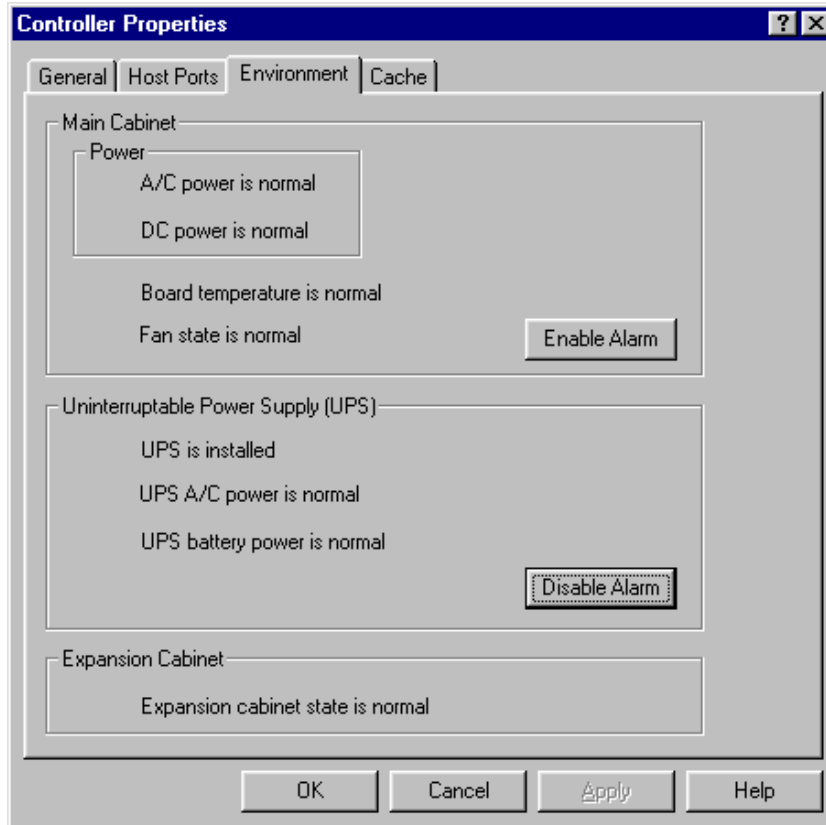


Figure 6-9. Environment controller properties tab

4. Click the **Cache** tab to check cache size. Your RAID Array 3000 comes with one 16 MB SIMM installed in slot A and slot B (Figure 6-10).

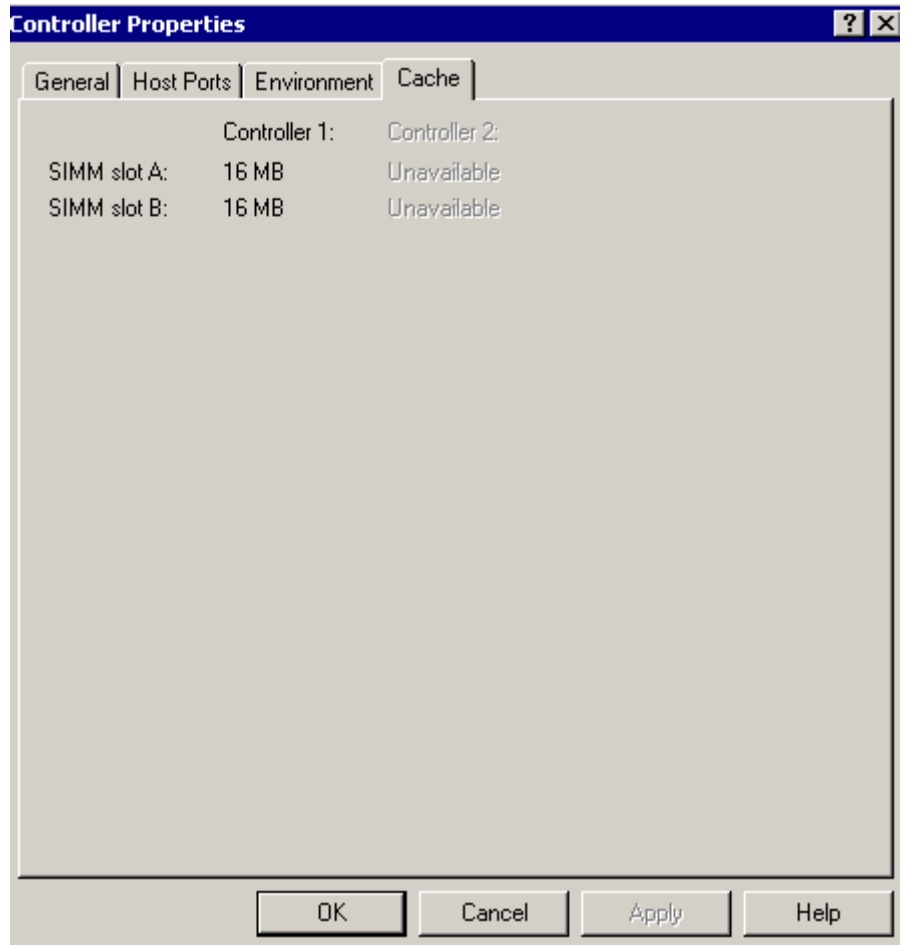


Figure 6-10. Cache controller properties tab

## Configuring Your RAID Array 3000 for Dual-Controller Operation

**NOTE:** To configure the system for dual-controller operation, you should have a PC with two serial ports. If your PC has only one serial port, Refer to Chapter 4 of the “*RAID Array 3000 Controller Shelf Hardware User’s Guide*” Second Controller Option for the procedure describing how to configure dual controllers from a single serial port.

In dual-controller operation each controller must be configured for either Active/Active mode or Active/Passive mode.

- In the Active/Active mode the top controller sees one host port as active, while the bottom controller sees the other host port as active. The controllers see their non-active host ports as passive. If one of the controllers fails, the surviving controller sees both host ports as active. In this way the surviving controller ensures that both host busses remain operational. The Active/Active mode can be useful for balancing I/O activity between controllers.
- In the Active/Passive mode the primary controller sees both host ports as active. The remaining controller sees both host ports as passive. If the primary controller fails, the remaining controller takes over and sees both host ports as active.

The Active/Active mode is the preferred mode. Do the following steps to configure the Active/Active mode:

1. Make sure the RAID Array 3000 is turned off.
2. Install the second controller in the bottom slot. Refer to the documentation packaged with the controller.
3. Connect the serial cable to the CTR BOTTOM connector on the back of the RAID Array 3000 and connect the other end of the cable to one of the PC’s available COM ports. (The top controller is usually connected to COM1 and the bottom controller to COM2).
4. Make sure that both serial cables are connected. Serial cables must be connected between the COM ports on the PC and CTR BOTTOM and CTR TOP connector on the back of the RAID Array 3000.
5. Power on the system.
6. Select Command Console version 2.2 from the Start Menu, then select HSZ22 StorageWindow.

7. Click the **Serial radio** button, the HSZ22 Management: Serial Connection window appears (Figure 6-11).
8. Select the PC's COM port (COM1) that the top controller (CTR TOP) is connected to, then click the **Connect** button. A second Serial Connection window appears for connecting the redundant controller.



Figure 6-11. HSZ22 management: serial connection (COM1)

- When the Serial Connection window appears again (Figure 6-12), select COM port (COM2) that the second controller (CTR BOTTOM, the redundant controller) is connected to (Figure 6-10); click **Connect** to display the Storage Window for COM1 and COM2, (Figure 6-13).



Figure 6-12. HSZ22 management: serial connection (COM2)

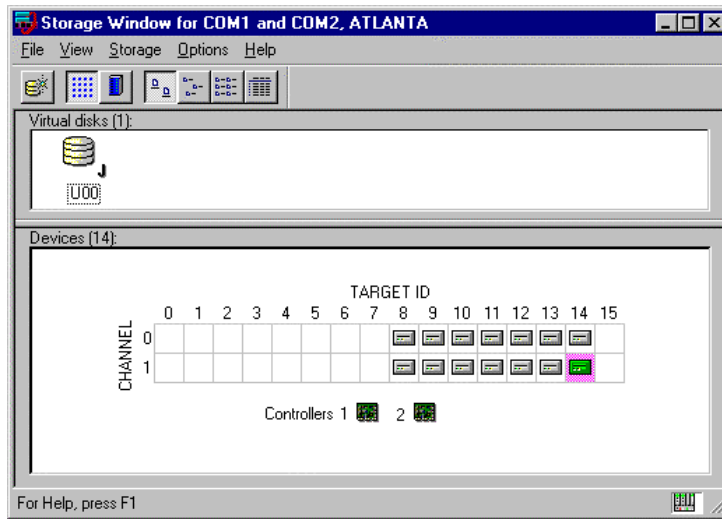


Figure 6-13. Storage window for COM1 and COM2

10. Double-click one of the controller icons to access the Controller Properties window (Figure 6-14).
11. Select the **Host Ports** tab to display the Host Ports property sheet.

**NOTE:** Host Port mode does not currently display Windows 2000 selection, keep mode selection to Windows NT

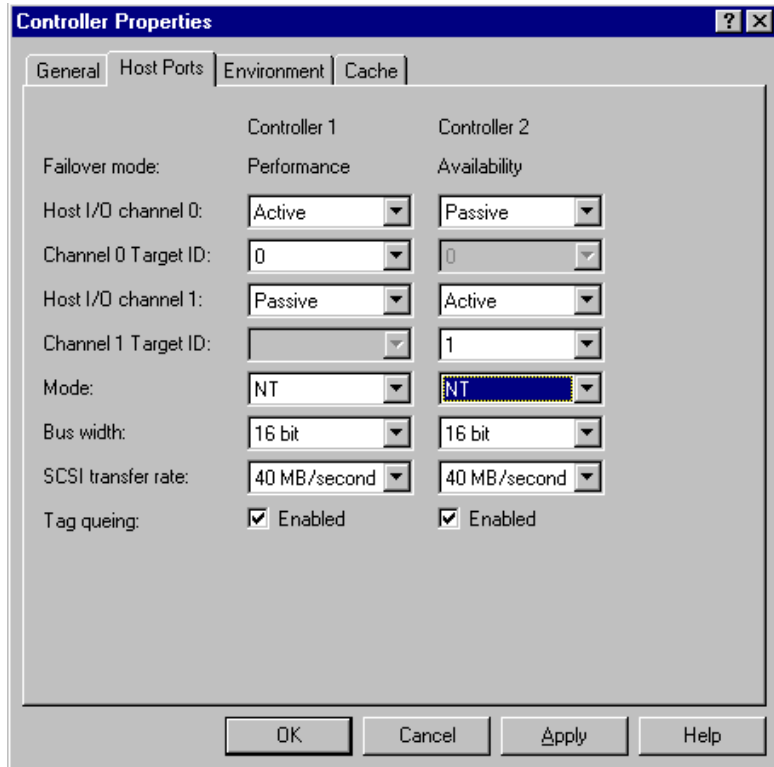


Figure 6-14. Controller properties for Windows NT

12. Set Host I/O channel 0 for Controller 1 to **Active**.
13. Set Host I/O channel 1 for Controller 1 to **Passive**.

**NOTE:** To apply any changes made on the Host Ports property sheet SWCC restarts the controllers. Make sure that the host ports are quiescent.

14. Set the Channel 0 Target ID for Controller 1 to 0.
15. Set the Channel 1 Target ID for Controller 2 to 1.



16. Set the mode for both controllers to Window NT.

**NOTE:** Each controller is configured to control one SCSI host port. In order to utilize both controllers, you must connect each SCSI port to a host bus adapter. The two adapters can be in one host system or in two different host systems or use BN21W-0B (Y-cable) to two BN38E-0B then BN37A-05.

## Creating Your First Virtual Disk

Command Console Client can create a number of different types of logical storage units called virtual disks on your RAID Array 3000. You can create:

- Single-device virtual disks (JBODs)
- Striped virtual disks (RAID 0)
- Mirrored virtual disks (RAID 1)
- Striped mirrored virtual disks (RAID 0+1)
- Striped parity virtual disks with fixed parity disk (RAID 4)
- Striped parity virtual disks with floating parity disk (RAID 5)

## Starting the Wizard

Virtual disks are created using Command Console Client's Virtual Disk Wizard.

After you have established a serial connection to your RAID Array 3000 subsystem and have accessed the subsystem's Storage Window, Select **Add Virtual Disk** from the Storage menu to start the Virtual Disk Wizard.



### Creating a Virtual Disk

1. Click the **radio** button of the RAID level you want, then click **Next** (Figure 6-15).

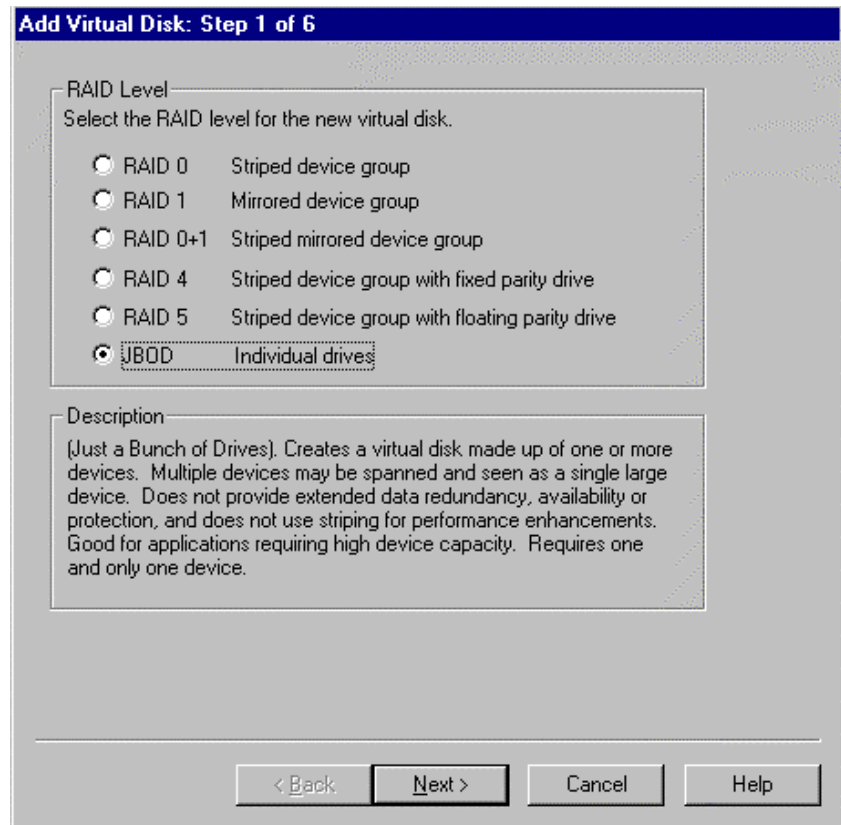


Figure 6-15. Add virtual disk wizard step 1

2. Select the devices you want to include in the virtual disk from a list of available storage devices. You select devices (to create a virtual disk) by clicking on them in the Devices Available window. As you click them, they are listed in the Details of selected device window pane (Figure 6-16).

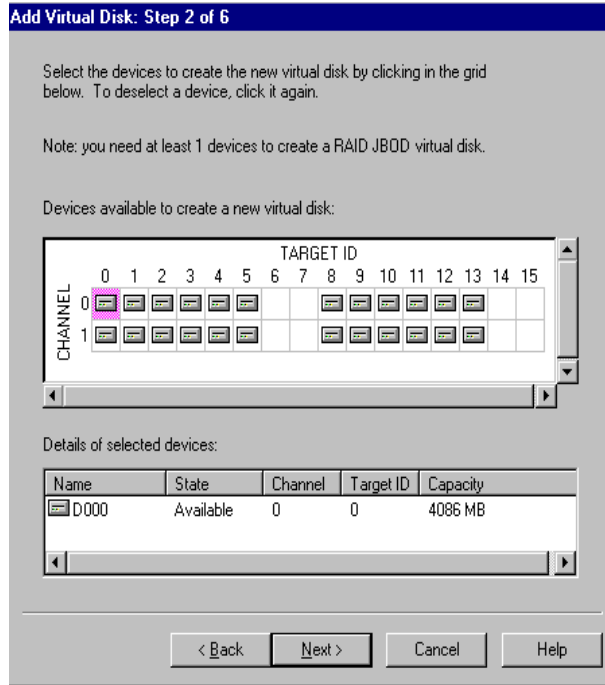


Figure 6-16. Add virtual disk wizard step 2

3. Select the capacity of the virtual disk, then click **Next**. The wizard offers you the option of using only a portion of the capacity of the devices you have selected for your new virtual disk. It displays the total, available capacity of the devices you have selected in the capacity box. Enter the size of the virtual disk you want to create in the box, then click **Add**; repeat this step if you are creating multiple partitions on this storage set. When finished, click **Next** (Figure 6-17).

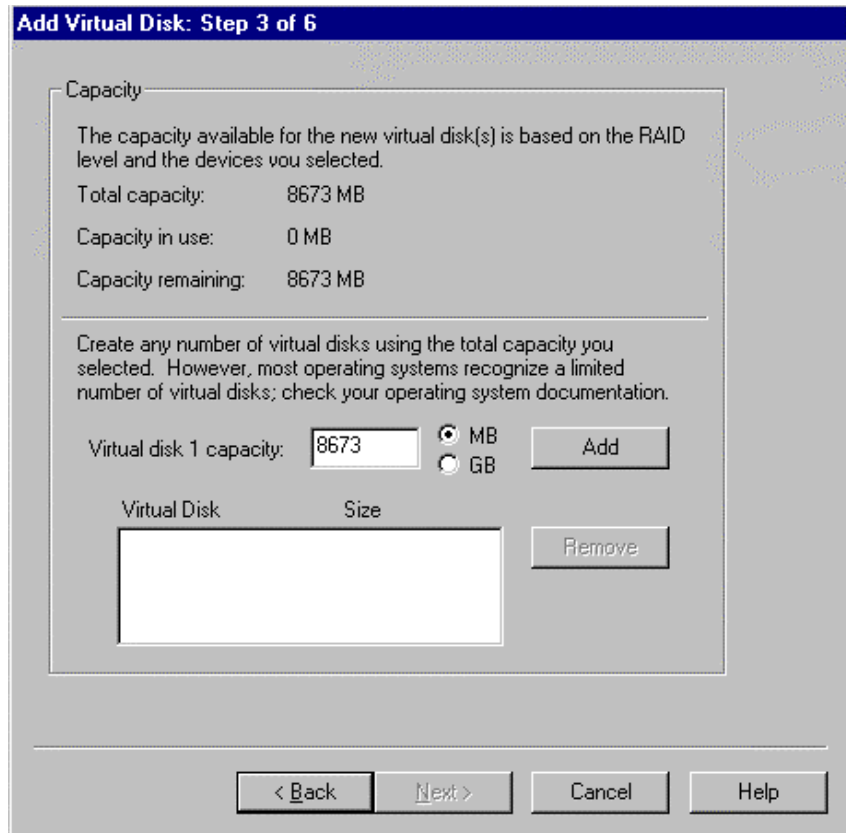


Figure 6-17. Add virtual disk wizard step 3

4. Specify the stripe size and host port (0 or 1), then click **Next** (Figure 6-18).

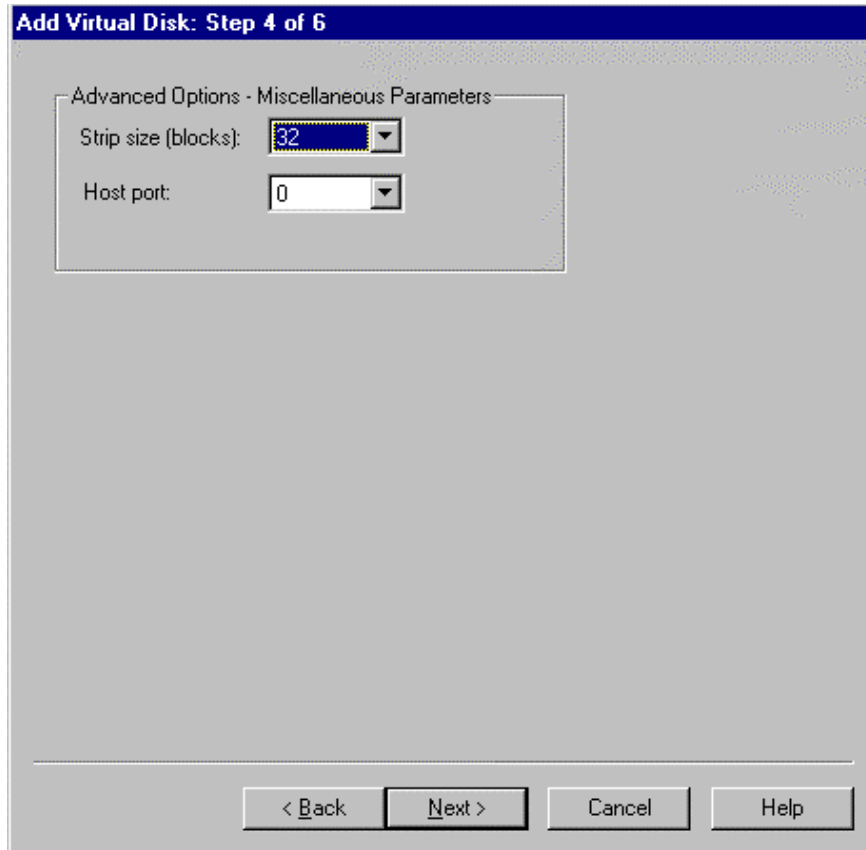


Figure 6-18. Add virtual disk wizard step 4

5. Specify the LUN number for the virtual disk. If you want to enable writeback cache, check the Enable box; then click **Next** (Figure 6-19).

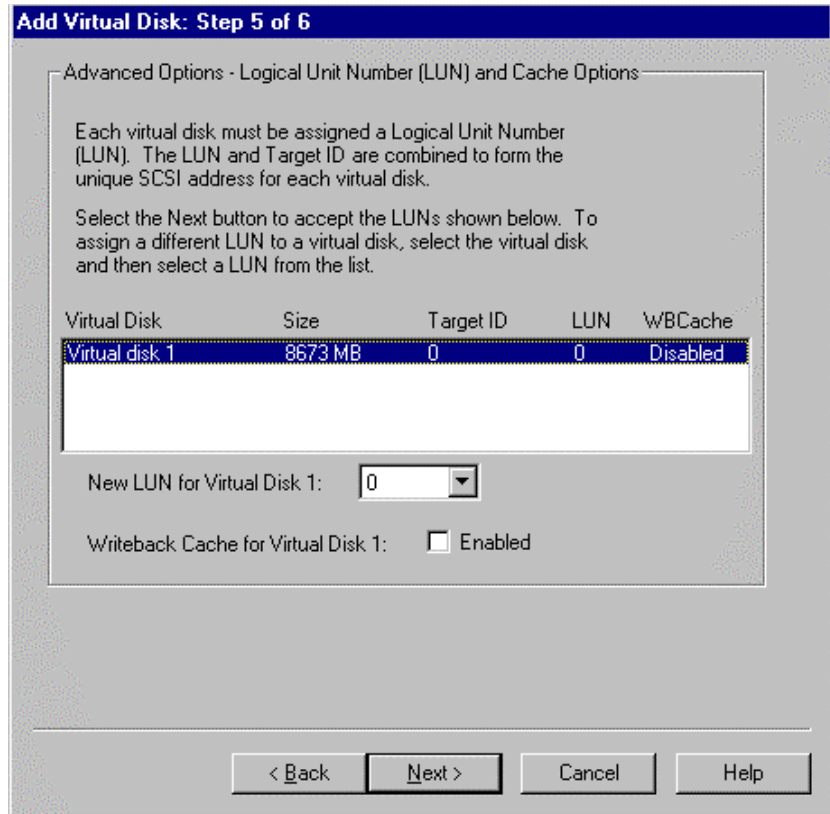


Figure 6-19. Add virtual disk wizard step 5

6. This final Virtual Disk Wizard window recaps the choices you have made in steps 1 through 5. If you are satisfied with your choices, click **Finish** (Figure 6-20).

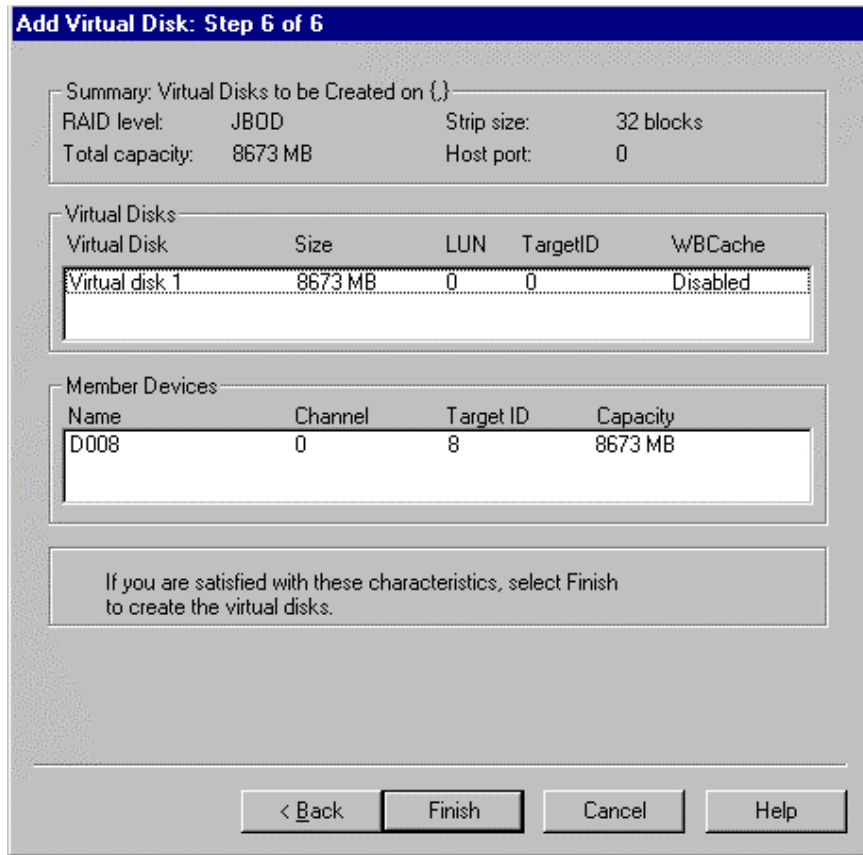


Figure 6-20. Add virtual disk wizard step 6

7. When you click **Finish** the storage set will start initialization; a confirmation menu will appear and you can confirm your choices.
8. You can view the virtual disks you have created by returning to the Storage Window (see “Establishing a Serial Connection” if you need help). Figure 6-21 shows what the Virtual Disk Window in the Storage Window looks like.

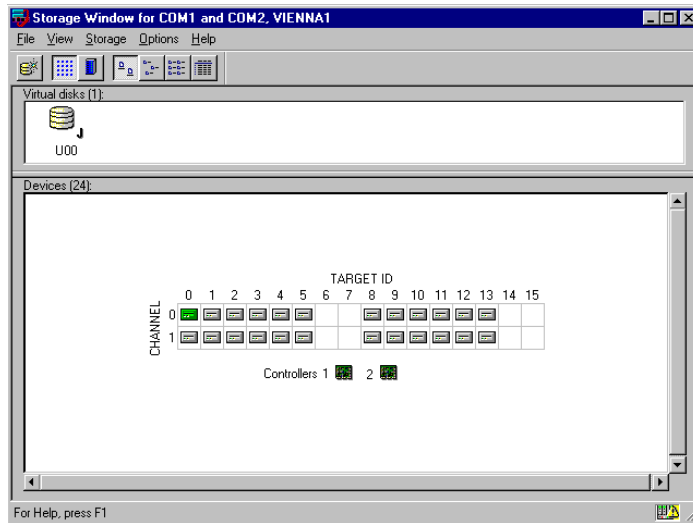


Figure 6-21. Storage window virtual disk window



# **Completing Your Storage Configuration Under Windows NT**

This chapter contains instructions for completing your configuration using the Windows NT 4.0 Disk Administrator (for Windows 2000 see Chapter 8).

## **Completing Your Configuration under Windows NT**

This section summarizes how to use the Windows NT Disk Administrator to complete a new StorageWorks Storage Subsystem Array configuration under Windows NT. For additional information, refer to your Windows NT documentation. Before you begin, remember to safeguard critical data. Back up your system using normal backup procedures before altering device partitions.

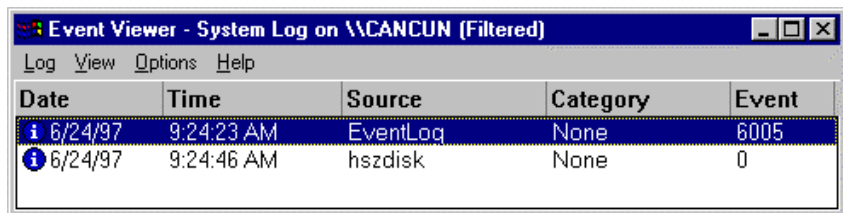
In order for Windows NT to recognize new StorageWorks Storage Subsystem devices or changes to existing configurations, you must reboot your system to restart Windows NT. If you have not already done so, reboot the system at this time.

## Verifying that HSZDISK.SYS Loaded

Prior to running Disk Administrator, verify that hszdisk recognizes the virtual disks that you created on your RAID Array 3000 subsystem as follows:

Open the Event Viewer in the Administrative Tools group. Look for an entry for hszdisk in the Event Viewer window.

- If an entry for hszdisk appears with 0 in the Event column, as shown in Figure 7-1, the hszdisk loaded successfully.
- If no entry for the hszdisk appears in the Event View window, reinstall hszdisk.
- If an entry for hszdisk appears with a 1 in the Event column, hszdisk did not load because it did not find any logical drives. First check the cabling and termination, then reconfigure the array.



The screenshot shows the Windows Event Viewer window titled "Event Viewer - System Log on \\CANCUN (Filtered)". The window has a menu bar with "Log", "View", "Options", and "Help". Below the menu bar is a table with the following columns: "Date", "Time", "Source", "Category", and "Event". The table contains two entries:

Date	Time	Source	Category	Event
6/24/97	9:24:23 AM	EventLog	None	6005
6/24/97	9:24:46 AM	hszdisk	None	0

Figure 7-1. Successful HSZDISK load

## Starting the Disk Administrator

On the NT 4.0 Desktop, click the **Start** button and from the Programs menu select Administrative Tools (Common), then select Disk Administrator to run the Disk Administrator program. A representative example of a Disk Administrator screen is shown in Figure 7-2.

**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 **Yes**) in order to have Disk Administrator recognize these new disks. For more information on this subject, refer to your Windows NT documentation.

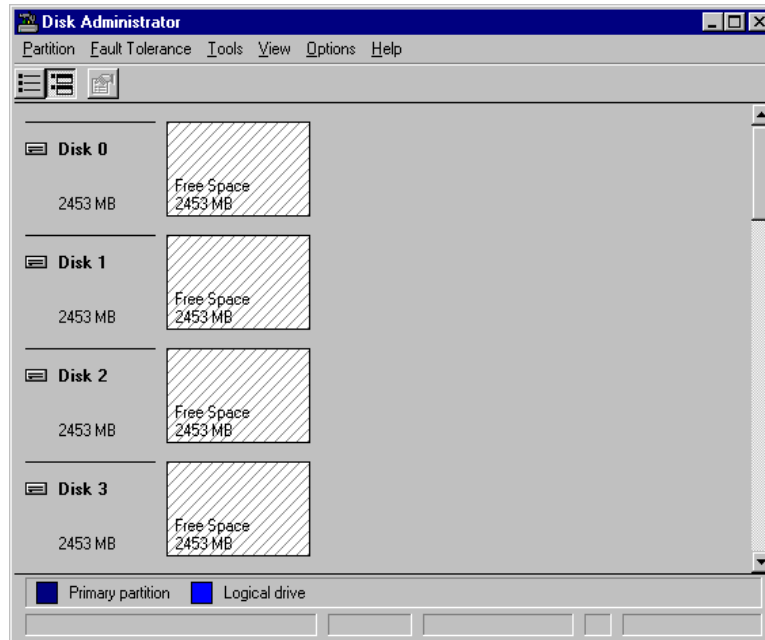


Figure 7-2. Disk administrator screen display

## Understanding the Disk Administrator Display

Disk Administrator creates a Bar Chart display of your disk configuration. Figure 7-2 shows that Windows NT has named the various devices that were created using the StorageWorks RAID Array 3000 Command Console Client GUI. Each disk device found by Windows NT is given a name for example, (Disk 0, Disk 1, etc). There should be an entry shown for each virtual disk created.

The entries in the Disk Administrator display should represent all your StorageWorks RAID Array 3000 Storage Subsystem virtual disks. Figure 7-2 also shows the corresponding free space for each disk.

## Verifying Your Configuration

1. Check that there is an entry in the Disk Administrator display for each of your StorageWorks RAID Array 3000 Storage Subsystem virtual disks. If there is not, you should go back and recheck your configuration.
2. Check that the capacity shown matches the physical size of the physical disk or the StorageWorks RAID Array 3000 Storage Subsystem virtual disk. If it does not match, recheck the configuration for the StorageWorks RAID Array 3000 Storage Subsystem and its members.

**NOTE:** Disk Administrator displays the usable capacity of a RAIDset and MIRRORset, not the combined total of the physical members.

## Creating Partitions

1. For each disk shown, click the partition area that you want to create.
2. Select the Partition pull-down menu and choose **Create** (see Figure 7-3) to display the Create Primary Partition window (see Figure 7-4).

**NOTE:** A storage set cannot be accessed unless it contains at least 1 valid partition that was created under the Disk Administrator.

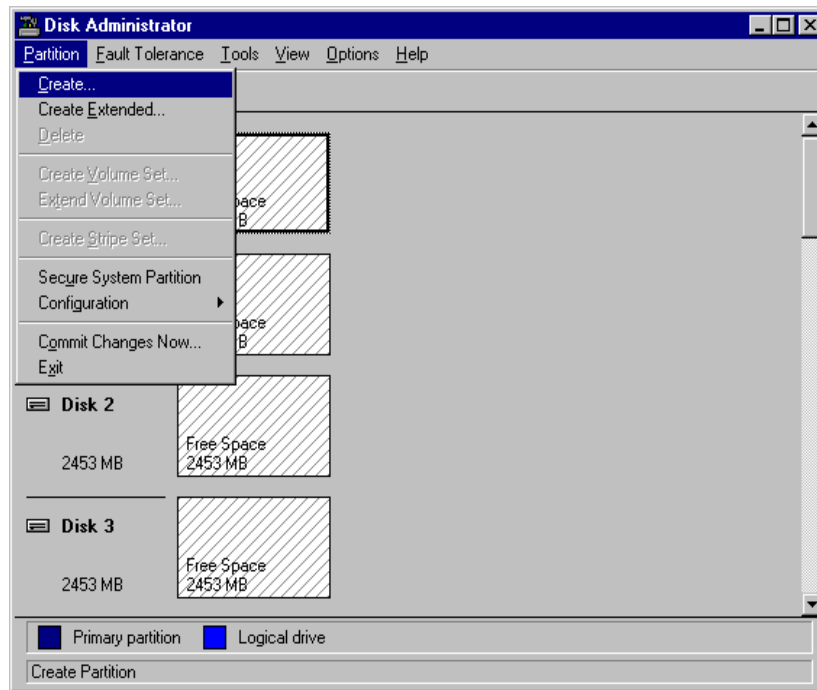


Figure 7-3. Partition pull-down menu

3. In the Create Primary Partition window, enter the size partition you want, then click **OK**. (Depending upon the partition size you choose a message window might appear asking you to confirm your selection).
4. Continue to create new partitions until all disks have been partitioned.

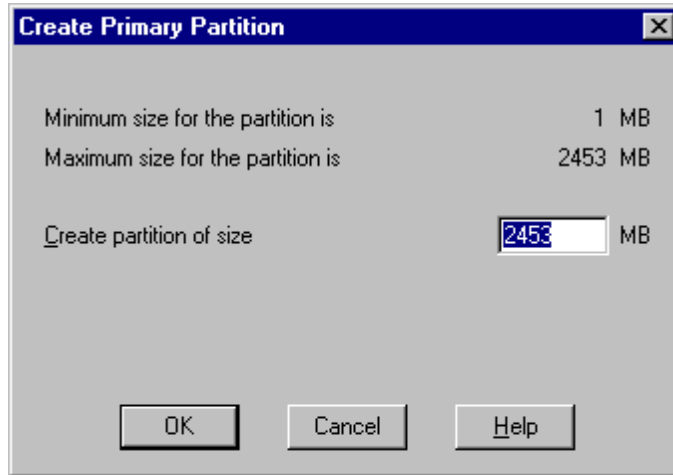


Figure 7-4. Create primary partition window

## Making Drive Letters 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. If the disk configuration change drive letters are subject to change after reboot. As an option, you can make the drive letters permanent. If you want to make the letter assignments permanent:

1. Access the Tools pull-down menu.
2. Select **Drive Letter** then choose **To Assign**. This process must be repeated for each partition (drive letter) that you wish to make permanent.

## Committing the Changes

When you have created all your partitions, commit the changes:

1. Access the Partition pull-down menu.
2. Click **Commit Changes Now**. A message window appears asking you to confirm the changes. Confirm the changes if they are correct.

**NOTE:** A message window appears following this step prompting you if you wish to save a copy of the configuration to a diskette. You may do so at this time, as prompted by the screen display.

## Formatting the Newly Created Partition

1. While still running Disk Administrator, click the **Tools** pull-down menu (Figure 7-5), and select **Format** to access the Format menu (Figure 7-6). The Format menu choices allow you to choose the file system type, FAT or NTFS, and the Quick Format option.

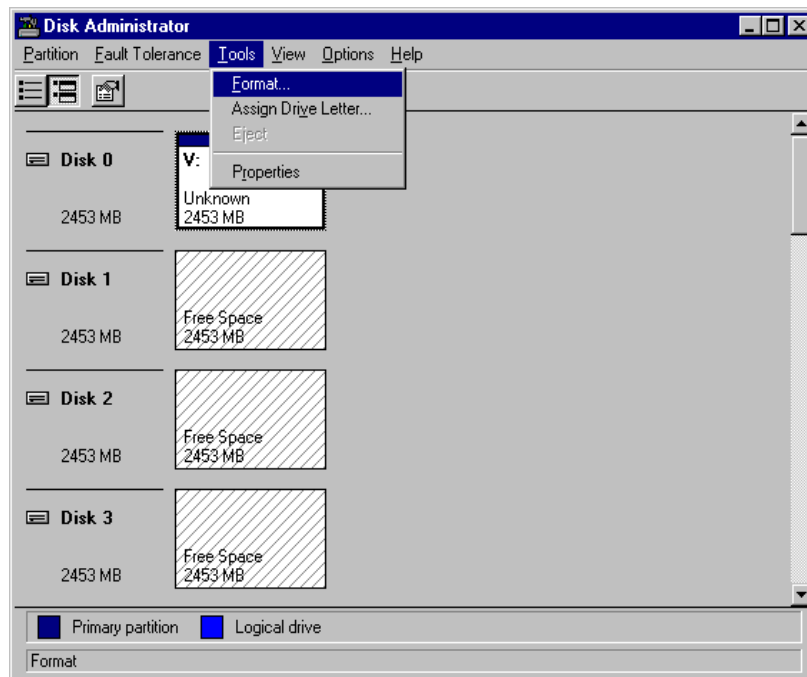


Figure 7-5. Tools pull-down choices

2. Select a file system and click **Start** to begin the format process. A message window appears advising you when the formatting is complete.

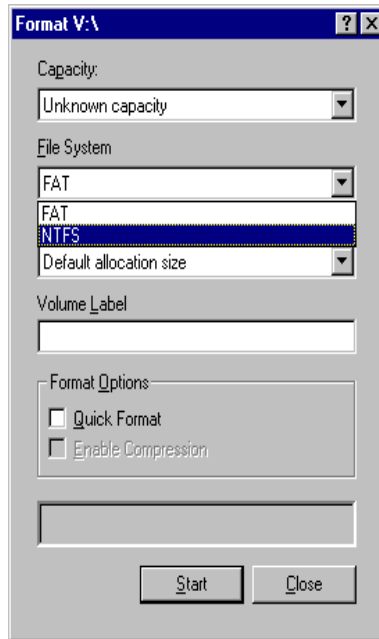


Figure 7-6. Format Menu

3. Continue to format each new partition until all partitions have been formatted.
4. When all partitions have been formatted, close Disk Administrator. At this point, the configuration has been completed, and is recognized by Windows NT.

**NOTE:** Always document and save your RA3000 RAID set configuration for future reference. Information on each RAID set and partition - the original LUN number, controller, and host port parameters - should be readily available if a problem occurs. Appendix A contains configuration sheets to help you in this process.



## **Completing Your Storage Configuration Under Windows 2000**

This chapter contains instructions for completing your configuration using the Windows 2000 Disk Manager.

### **Completing Your Configuration under Windows 2000**

This section summarizes how to use the Windows 2000 Disk Manager to complete a new StorageWorks Storage Subsystem Array configuration under Windows 2000. For additional information, refer to your Windows 2000 documentation. Before you begin, remember to safeguard critical data. Back up your system using normal backup procedures before altering device partitions.

In order for Windows 2000 to recognize new StorageWorks Storage Subsystem devices or changes to existing configurations, you must reboot your system to restart Windows 2000. If you have not already done so, reboot the system at this time.

## Starting Disk Management

To start the Disk Management on the Windows 2000 desktop, right click **My Computer**, scroll down and click **Manage**. The Computer Management window appears (Figure 8-1). Locate the folder Storage and click **Disk Management**.

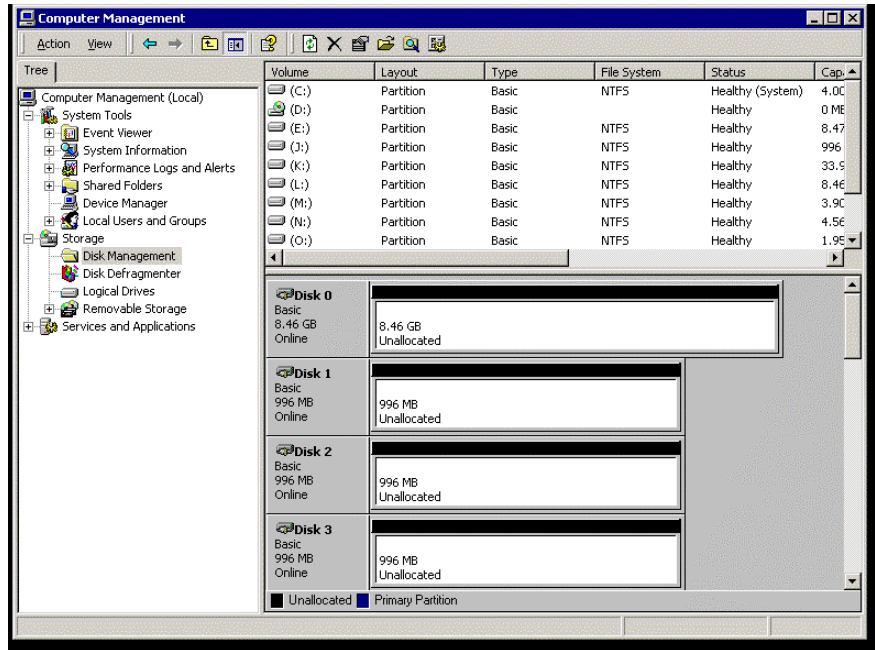


Figure 8-1. Computer management window

Dynamic disks are not supported with the RA3000.

**NOTE:** The first time you run Disk Manager after adding new disks, one or more message windows may appear asking you to confirm whether you want to have Disk Manager provide its signature on the new disks. Confirm doing so (by clicking **Yes**) in order to have Disk Manager recognizes these new disks. For more information on this subject, refer to your Windows 2000 documentation.

## Understanding the Disk Management Display

Disk Management creates a Bar Chart display of your disk configuration. Figure 8-1 shows that Windows 2000 has named the various devices that were created using the StorageWorks RAID Array 3000 Command Console Client graphical user interface. Each disk device that is found by Windows 2000 is given a name (for example, Disk 0, Disk 1). There should be an entry shown for each virtual disk created.

The entries in the Disk Management display should represent all your StorageWorks RAID Array 3000 Storage Subsystem virtual disks. Figure 8-1 also shows the corresponding free space for each disk.

## Verifying Your Configuration

1. Check that there is an entry in the Disk Management display for each of your StorageWorks RAID Array 3000 Storage Subsystem virtual disks. If there is not, you should go back and recheck your configuration.
2. Check that the capacity shown matches the physical size of the physical disk or the StorageWorks RAID Array 3000 Storage Subsystem virtual disk. If it does not match, recheck the configuration for the StorageWorks RAID Array 3000 Storage Subsystem and its members.

**NOTE:** Disk Management displays the usable capacity of a RAIDset and MIRRORset, not the combined total of the physical members.

## Creating Partitions

1. For each disk shown, click the partition area that you want to create.
2. Select the Partition pull-down menu and choose Create Partition (see Figure 8-2) to display the Create Primary Partition window.

**NOTE:** A storage set cannot be accessed unless it contains at least 1 valid partition that was created under the Disk Management.

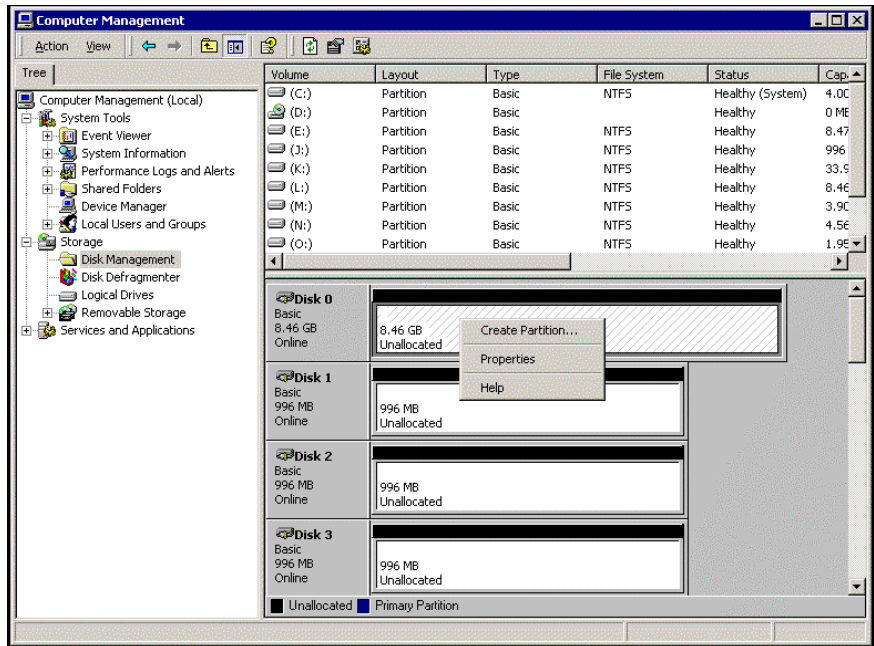


Figure 8-2. Partition creation menu

3. Create Partition Wizard appears (Figure 8-3) Follow the instructions in this utility to create partitions on your disks. Create Partition Wizard lets you create primary extended partitions, the size of the partition drive letter assignment, file system and formatting (Figures 8-4 through 8-7).

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

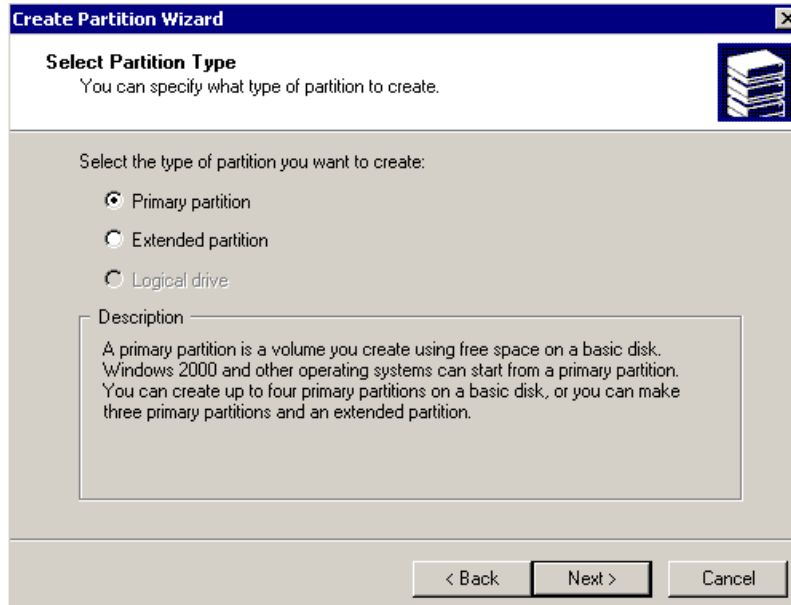


Figure 8-3. Create partition Wizard

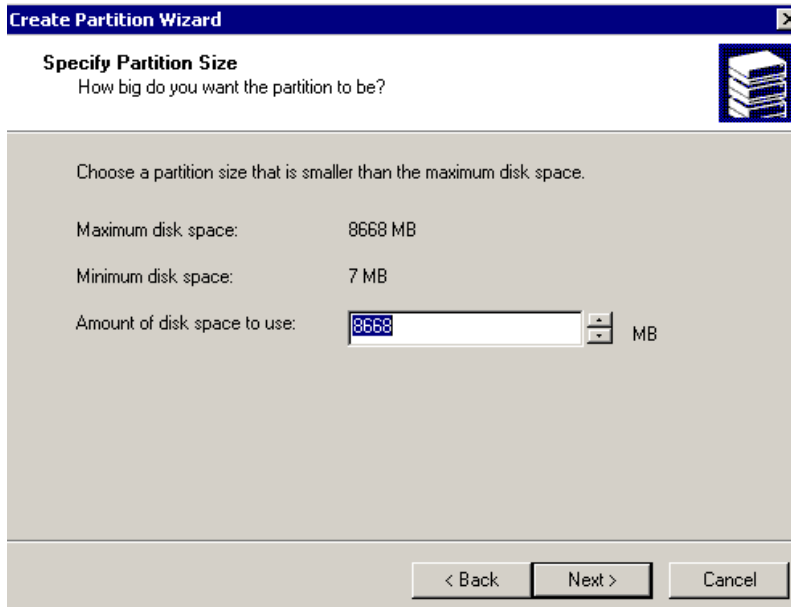


Figure 8-4. Specify partition size

Figure 8-5 shows how to assign a drive letter or path.

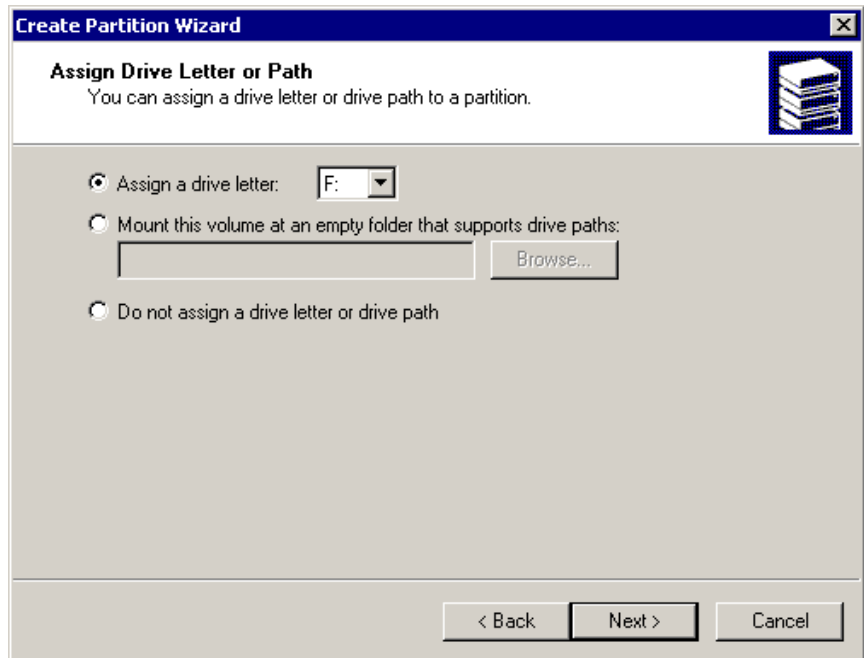


Figure 8-5. Assign drive letter or path

Figure 8-6 shows how to format the partition and the settings.

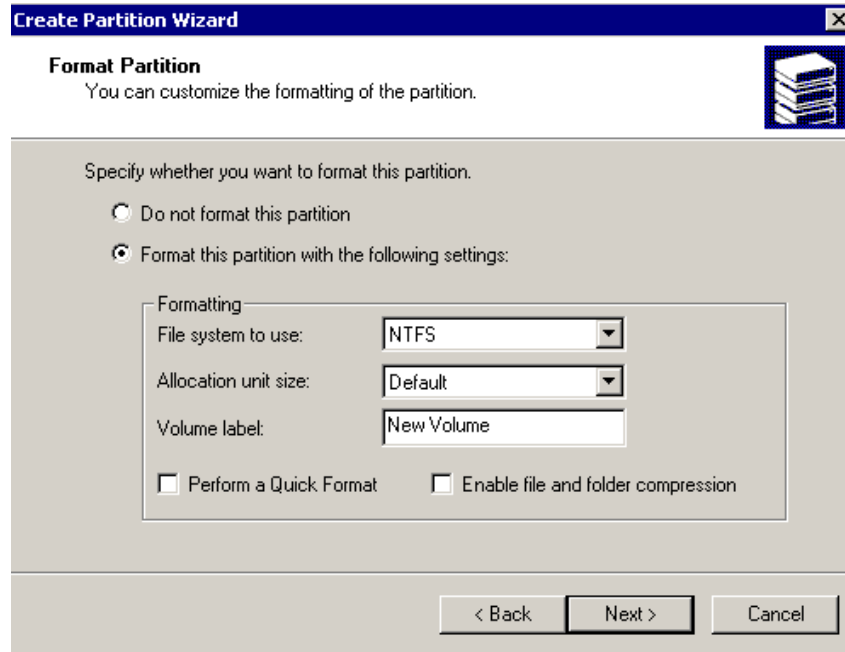


Figure 8-6. Format partition

Figure 8-7 shows Completing Create Partition Wizard.

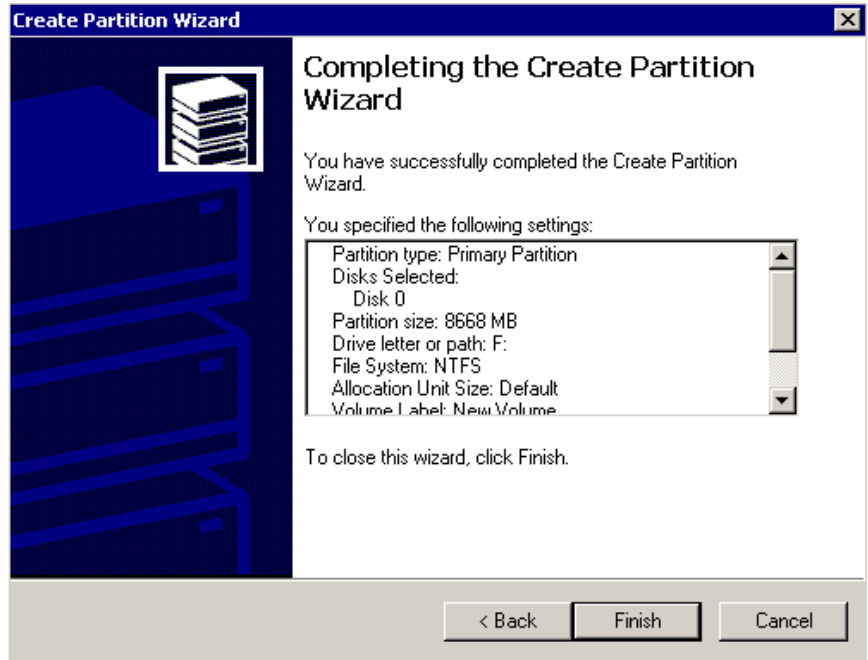


Figure 8-7. Completing the create partition wizard

**NOTE:** Always document and save your RA3000 RAID set configuration for future reference. Information on each RAID set and partition—the original LUN number, controller, and host port parameters—should be readily available if a problem occurs. Appendix A contains configuration sheets to help you in this process.



## *Chapter 9*

# **Communicating Over a Network with Windows NT and Windows 2000**

This chapter introduces you to Command Console's agent and provides instructions on how to establish communication over a network. The instructions include how to install and configure the agent and how to add storage subsystem host systems to the network using Command Console Client.

To communicate with your RAID Array 3000 over a network, two software applications are required: a client and an agent. Command Console Client is a Graphical User Interface (GUI) which installs and runs on a Windows host, while Command Console Agent installs and runs unseen in the background on the storage subsystem's host computer. The Client was installed in Chapter 6 "Installing Command Console Client and Creating Your First Virtual Disk". The Agent is installed in this chapter and together, the two provide the software link required for communication over a network.

## Agent

The agent runs on a host system as a server application. To establish communication over a network, you must install Agent on the host system to which the storage subsystem is connected.

The agent provides the software interface between the host storage subsystem and any number of Command Console Client sessions running on either the host or remote system, allowing you to configure and monitor your storage subsystem from many locations.

The agent also provides access protection and asynchronous fault notification. You can configure Agent to use TCP notification to Command Console Client or SNMP notification to an SNMP-compatible monitoring application.

## Client

Command Console Client is the control interface for your RAID Array 3000. Before you can communicate with your storage subsystem over a network, the client address must be added to the agent database.

## Before You Start

- To run Agent, your system resources must meet the minimum requirements listed in Table 9-1.

---

**Table 9-1**  
**Minimum Agent Host System Requirements**

<b>Host Feature</b>	<b>Requirement</b>
PC requirements	Intel 486, 66 MHz, 16 MB memory, 1 MB free disk space, and a CD-ROM drive
Operating system	Microsoft Windows NT 4.0 SP 6a, Windows SP 1
Network connection	TCP/IP-compatible network card
Controller compatibility	StorageWorks RAID 3000 controller

- You need password protection for Agent's host system. You may specify a password during the Agent's installation routine.
- You will also need the IP name of Command Console Client's host system and you need a name for the storage subsystems connected to the Agent's Windows NT host system.
- You need to have installed TCP/IP services on your NT server.
- You need to have created a Communications virtual disk on your RAID Array 3000 using Command Console Client and a serial port connection. See Chapter 6 "Installing Command Console Client and Creating Your First Virtual Disk".
- You need to have assigned a Windows NT drive letter to the Communications virtual disk using the Disk Administrator. See Chapter 7 "Completing Your Storage Configuration Under Windows NT".

## **Installing the Agent**

1. Place the RAID Array 3000 Software for NT/Intel/PCI CD-ROM in your storage subsystem's host system CD-ROM drive.
2. The Agent is located in D:\SWCC. Double-click the **Setup** icon to begin the setup procedure.

3. When the first SWCC Setup screen appears (Figure 9-1 ) follow the screen instructions. Select the option to install the HSZ22 Agent. If you click the **Next** button the second StorageWorks Command Console Setup screen appears (Figure 9-2 ).

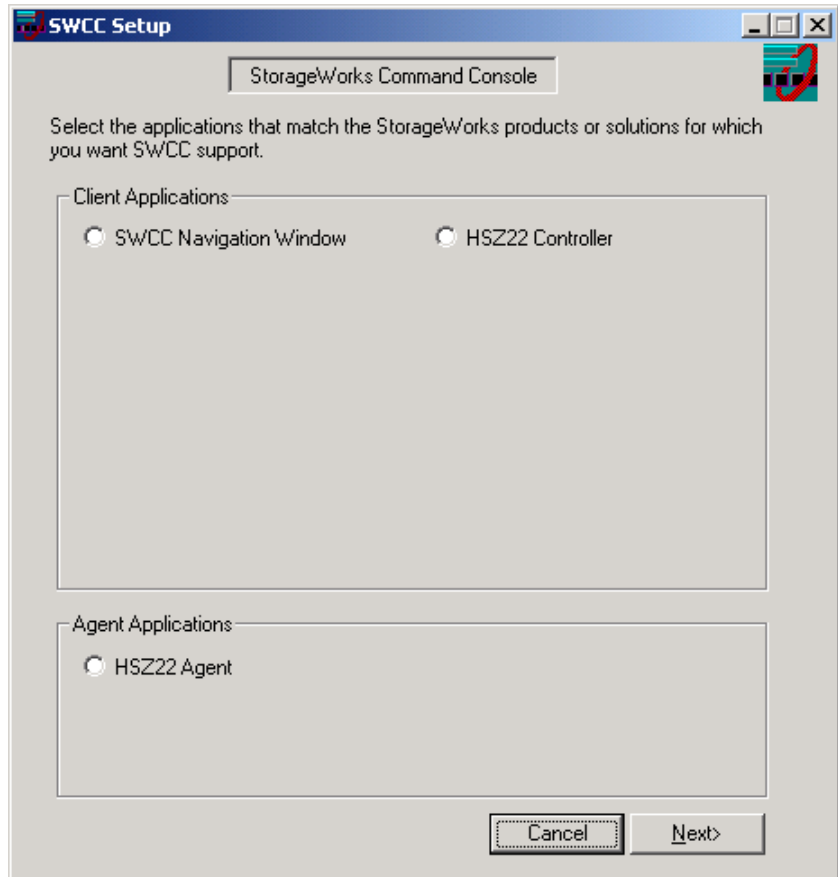


Figure 9-1. First SWCC Setup Screen

4. The second setup screen (Figure 9-2 ) confirms that the agent is being installed. Click **Next**.

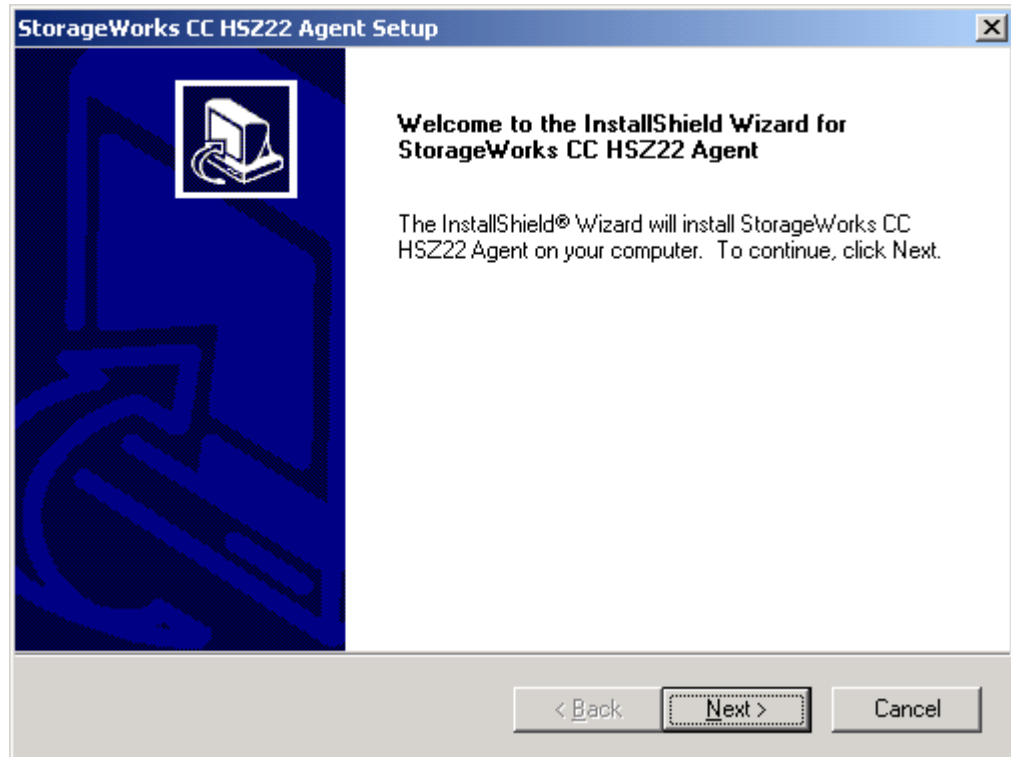


Figure 9-2. SWCC Setup Screen for the Agent

5. The next screen is the StorageWorks CC HSZ22 Agent License Agreement. Read the terms of the license and click **Yes**.

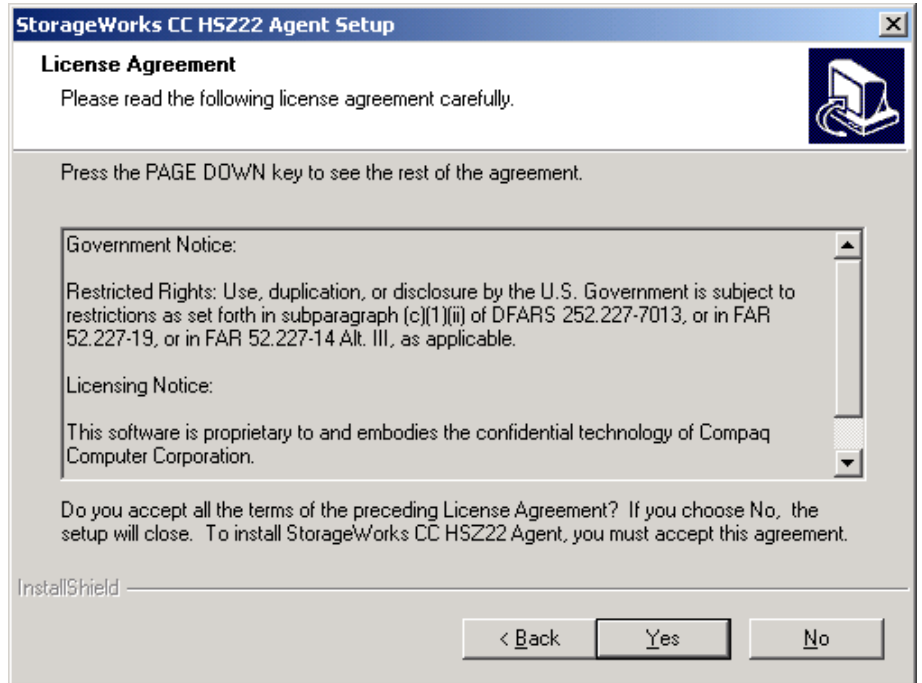


Figure 9-3. SWCC Agent License Agreement

6. The Setup Status screen is displayed while the Agent is being installed (Figure 9-4). The Agent is placed in a subdirectory under the directory path that was specified for the installation of the Command Console.

**NOTE:** If Command Console has not been installed on the host system then the Agent is installed in the default directory: C:\Program Files\Compaq\SWCC.

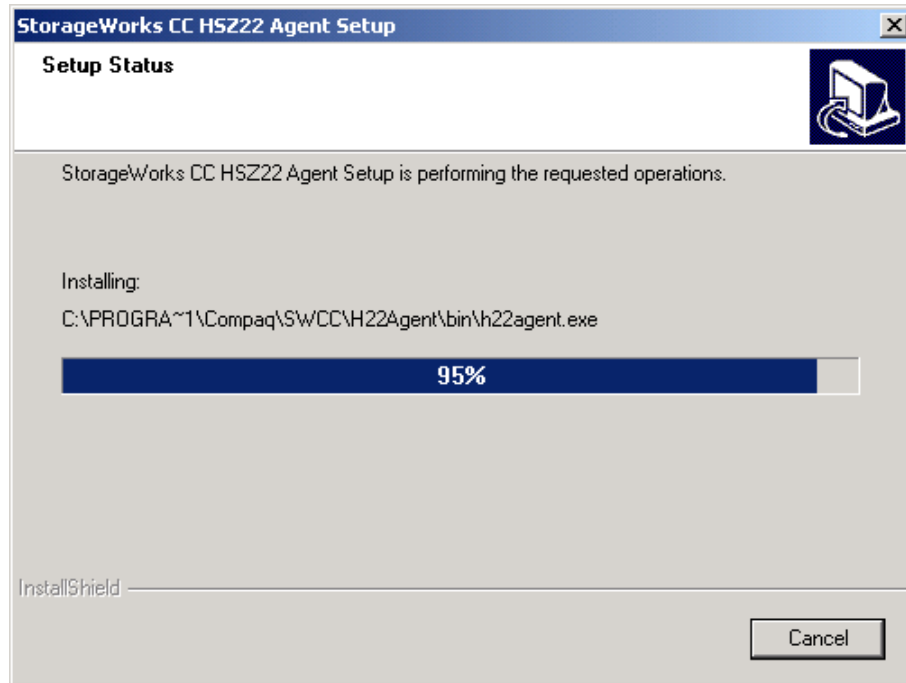


Figure 9-4. SWCC Setup Status Screen

7. The Agent is now installed and the Question screen is displayed.

**NOTE:** To run the Agent configuration utility, at least one virtual disk must have been created and mapped to a LUN.

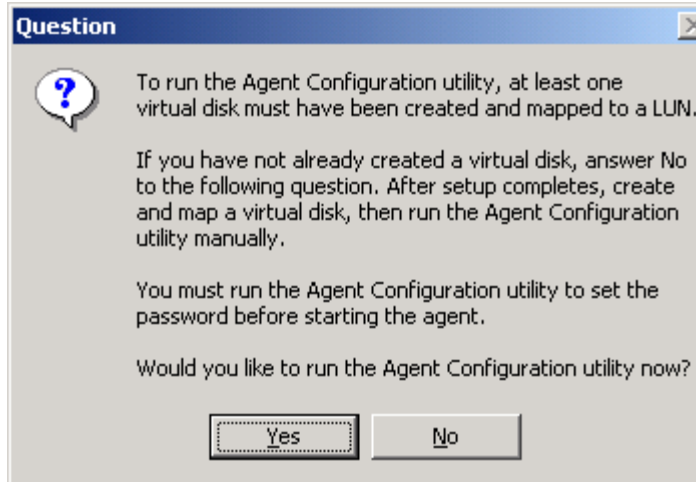


Figure 9-5. Virtual Disk Question Dialog

If you have created a virtual disk, click the **Yes** button to start the configuration utility. If you have not yet created a virtual disk, click the **No** button instead; the setup program exits and you can create a virtual disk with SWCC and make a partition with disk administrator. See Chapters 6 “Installing Command Console Client and Creating Your First Virtual Disk” and Chapter 7 “Completing Your Storage Configuration Under Windows NT” for details. Return to the Agent configuration utility from the Start menu.



## Configuring the HSZ22 Agent on Windows NT

### Configuring the Agent

There are three steps to configuring the Agent:

- Entering or modifying a password
- Entering or modifying Client data
- Naming the storage subsystem and entering or modifying storage subsystem data

You start the configuration utility in one of two ways. One way is by clicking **Yes** on the Question dialog box at the end of the Agent installation. Another way is by using the Start menu to access the configuration utility. Either way the first StorageWorks Command Console HSZ22 Agent Configuration Utility screen appears (Figure 9-6).

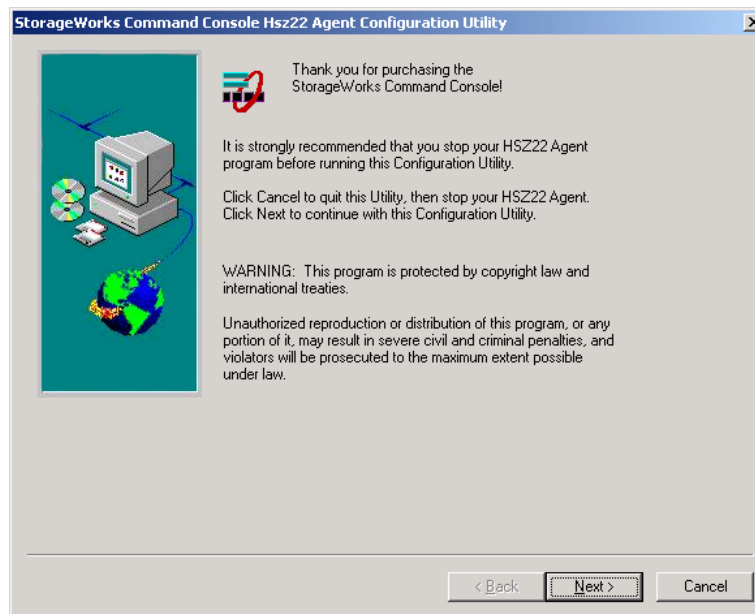


Figure 9-6. StorageWorks Command Console HSZ22 Agent Configuration Utility Screen

If this is the initial installation of the Agent then click **Next** on the screen. This displays the second StorageWorks Command Console HSZ22 Agent Configuration Utility screen (the Agent Password screen). If this is not the initial installation then you should follow the screen directions, eventually returning to this point in the procedure.

1. When the Agent Password screen appears (Figure 9-7 ) you can enter a password or modify a password (if this is not the initial installation). If you are not entering or changing the password, make sure Use Current Password is selected. Click the **Next** button.

**NOTE:** Do not alter the default value of the Log File Max Size field unless directed to by Compaq Technical Support. The default value of "0" places no limit on the size of the log file.

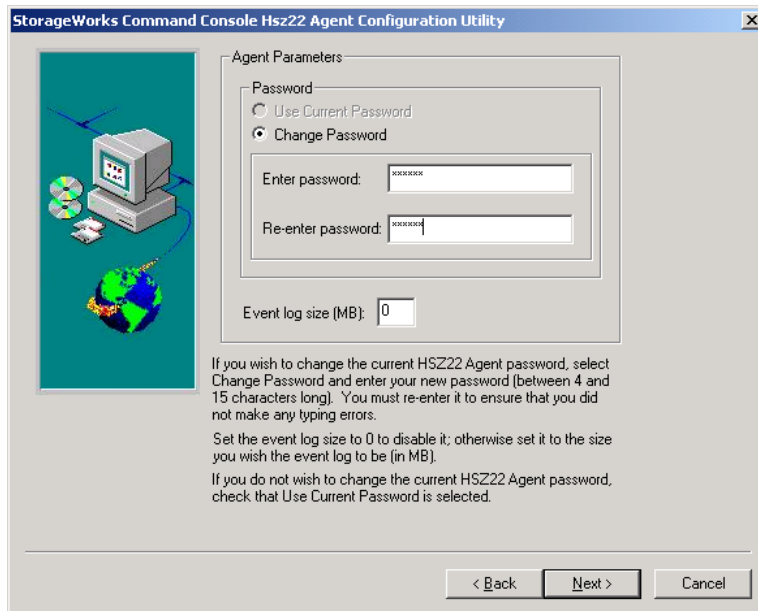


Figure 9-7. Agent Password Screen

2. When the third StorageWorks Command Console HSZ22 Agent Configuration Utility screen (Client Information) appears (Figure 9-8 ) you can enter client information or modify the information (if this is not the initial installation). If you are not entering or changing the client information, make sure *Use Current Client Information* is selected. Click the **Next** button

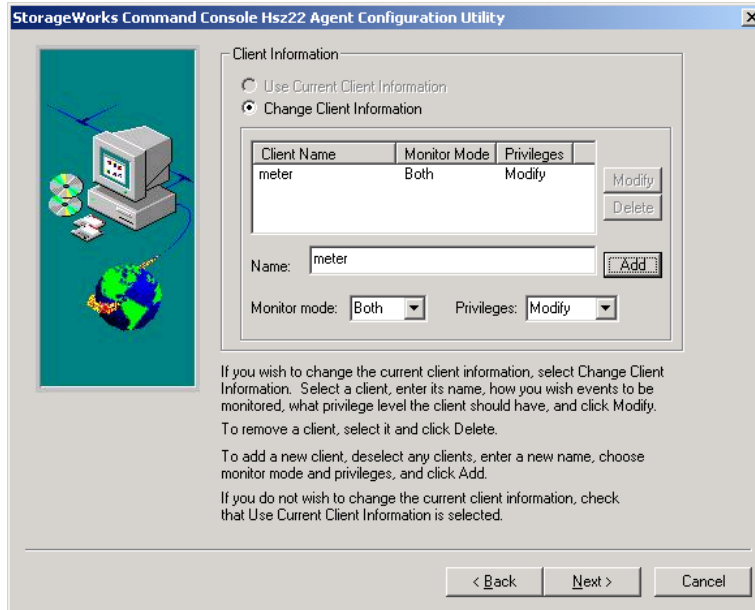


Figure 9-8. Client Information Screen

- When the fourth StorageWorks Command Console HSZ22 Agent Configuration Utility screen (*Subsystem Information*) appears (Figure 9-9) you can enter subsystem information or modify the information (if this is not the initial installation). If you are not entering or changing the client information, make sure Use Current Subsystem Information is selected. Click the **Next** button.

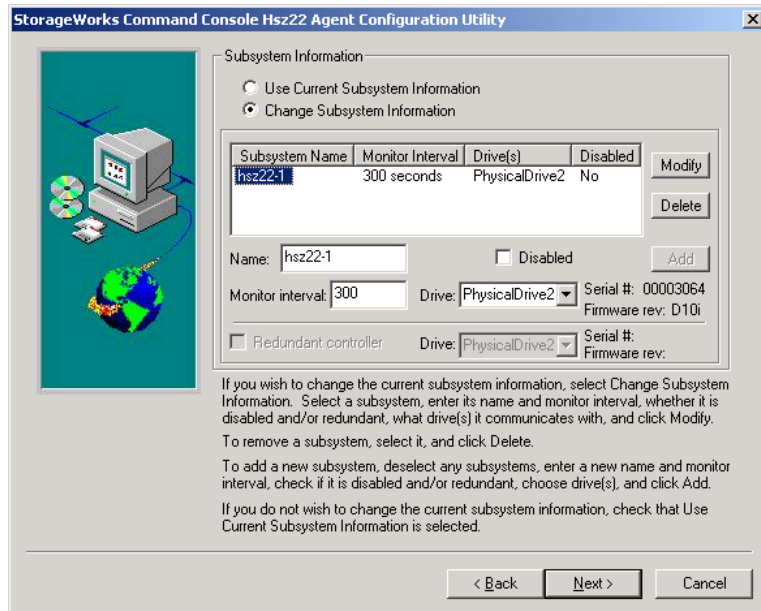


Figure 9-9. Subsystem Information Screen

You have completed the Agent configuration and the last StorageWorks Command Console HSZ22 Agent Configuration Utility screen (Summary) (Figure 9-10 ) should be on the display. The Summary screen shows any information changes you have made to the client and subsystem, and indicates if you have changed the password, although the password information is not shown on the screen.

If the changes, or the information you entered for an initial installation, are correct, click the **Finish** button to record the information

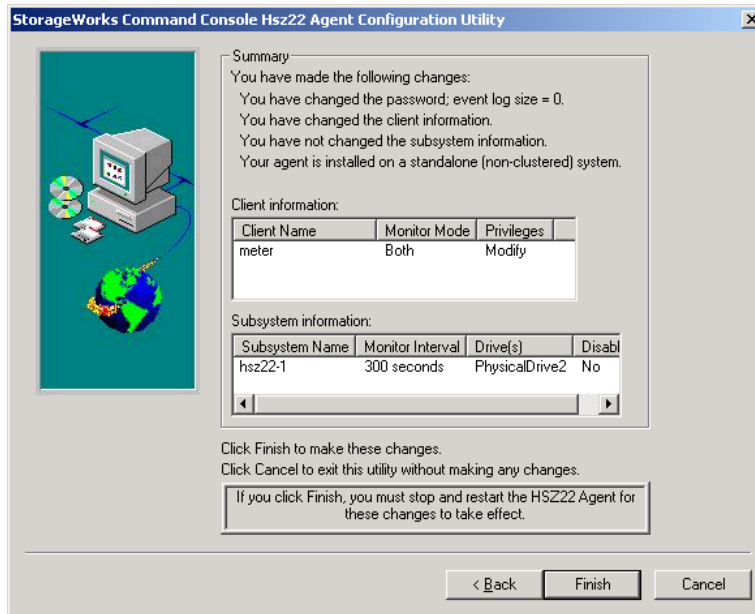


Figure 9-10. Summary Screen

Click the **Finish** button on the Summary screen. For an installation the NT Agent Setup screen (Figure 9-11 ) appears on the display. For a reconfiguration the utility closes.

Next go to the Control Panel in Windows. Click the Services applet, select HSZ22 Agent service and then click the **Start** button to start the Agent.

**NOTE:** Each time you change the Agent configuration you must go to *Services*, stop the Agent and restart it to put the changes into effect.

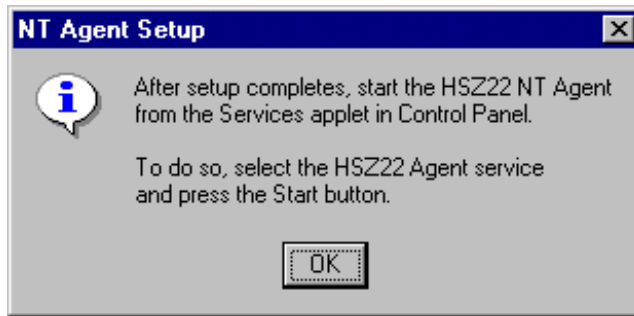


Figure 9-11. NT Agent Setup

After the Agent is installed and configured you can re-configure by selecting HSZ22 NT Agent Configurator from the Start menu (Figure 9-12 ).



Figure 9-12. Start Menu Screen

## Adding Storage Subsystems and Their Hosts to the Network

Storage subsystems and their host systems are added to the network using Command Console Client. Command Console Client can be installed locally in the storage subsystem's host system or in a remotely located PC connected to the network. Client installs and runs only on Windows NT or Windows 2000 PCs. To complete the network link proceed as follows:

1. Install Command Console Client. (See Chapter 4 “Installing Command Console Client and Creating Your First Virtual Disk”). In the system you will use to configure and monitor your RAID Array.
2. Make sure that you have properly installed and configured an Agent on the storage subsystem host system.
3. Select StorageWorks Command Console from the Command Console Start menu (Figure 9–13). After a short wait, Client displays the Navigation Window (Figure 9–14). The Navigation Window lets you monitor and manage storage subsystems over the network.

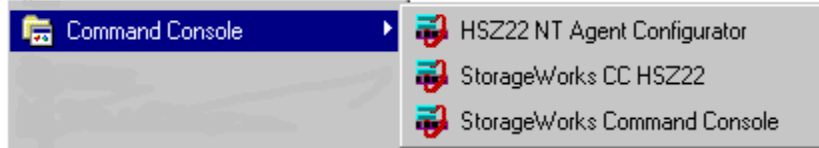


Figure 9-13. Command console start menu

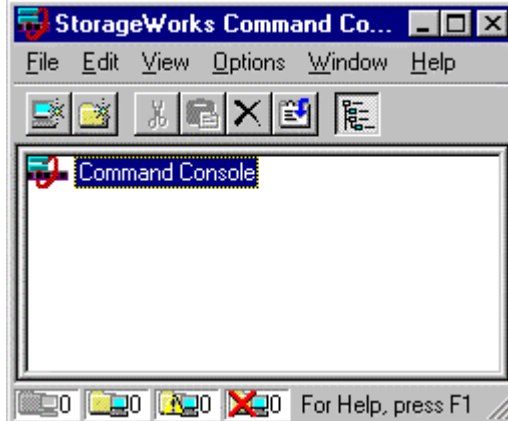


Figure 9-14. Navigation window

4. System to display the Add System dialog box (Figure 9–16).

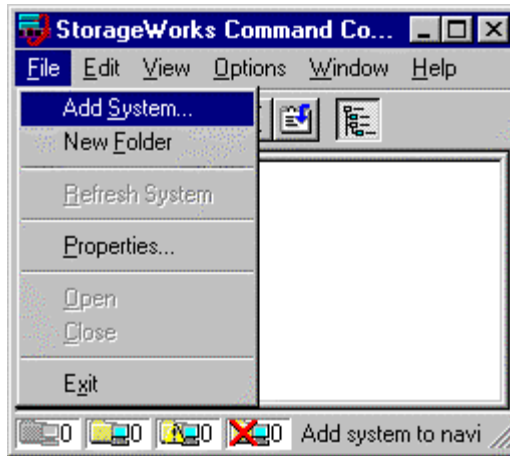


Figure 9-15. Navigation window file menu

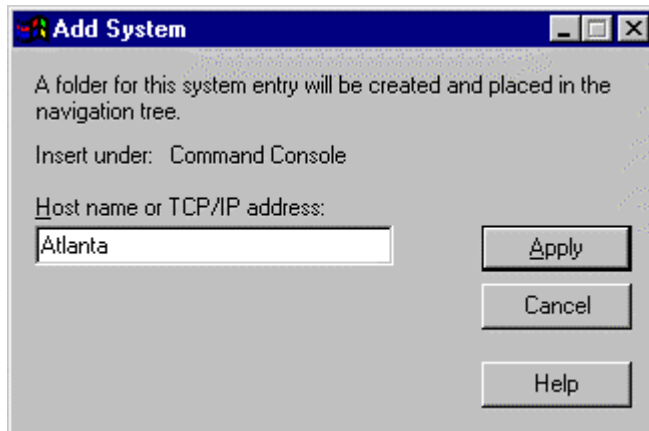


Figure 9-16. Add system dialog box



5. **Apply** button. Command Console Client searches for, finds, then displays the storage subsystem's host system as an icon in the Navigation Window (Figure 9-17).



Figure 9-17. Navigation window showing storage host system "Atlanta"

6. Click the plus sign to expand the host computer icon. When expanded, the Navigation Window displays an icon for the storage subsystem (Figure 9-18). In this example, the storage subsystem is named subsys1. To access the subsys1 Storage System, double-click the Storage Window icon.

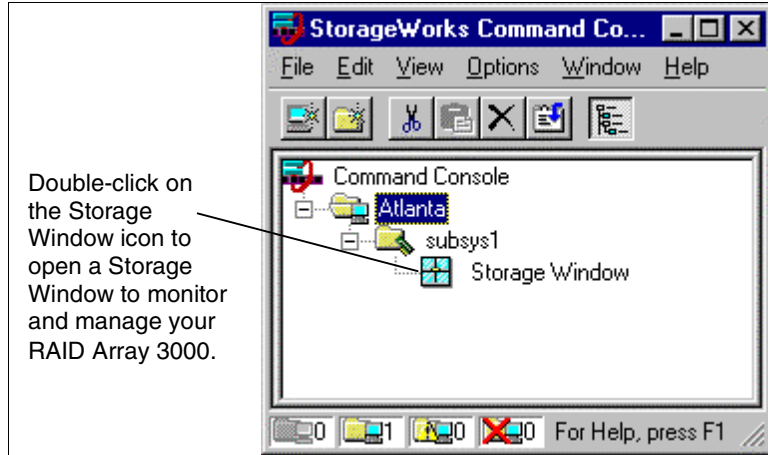


Figure 9-18. Navigation window showing expanded "Atlanta" host Icon

# Appendix **A**

## Configuration Records

### Blank Forms

This appendix contains copies of a table to be used to record the configuration of your system. If additional copies are required, the table can be reproduced.

**NOTE:** Always document and save your RA3000 RAID set configuration for future reference. Information on each RAID set and partition –the original LUN number, controller, host port parameters, and redundancy group –should be readily available if a problem occurs. Follow procedures outlined in Appendix B to locate the configuration settings.







## Appendix **B**

# HSZ22 Host LUN Mapping Procedure

This appendix contains a procedure that explains how to correct a host LUN mapping problem.

If a RAIDset loses its host LUN mapping, the virtual disk LUN number can be inadvertently set to -1. The purpose of this appendix is to describe how to correct both a host port mapping and a LUN mapping problem.

### Correcting a Host Port Mapping Problem

When a RAIDset becomes unmapped, the host port can get set to -1. This can be viewed on the Virtual Disk Properties page under the Settings field of the display. To restore your Virtual Disk Properties setting to normal operation, perform the following steps.

1. Open the StorageWorks Command Console.
2. Double-click the desired virtual disk and check controller, host port, and LUN number. If there is -1 LUN, proceed to step 3. If all LUNs have a valid LUN number, the RAIDsets are configured appropriately.
3. Click Settings on the virtual disk sheet, select the host port number, and follow the instructions displayed on the screen. The RA3000 will reboot.
4. Open the StorageWorks Command console and click **Virtual Disks** and then **Properties** to ensure the settings were saved.

This remedies most LUN Mapping problems. If unsuccessful, perform the procedure “Correcting a Host LUN Mapping Problem”.

## Correcting a Host LUN Mapping Problem

When constructing RAIDsets or RAIDsets with partitions using StorageWorks Command Console, the utility interfaces directly with the HSZ22 controller and maps a unique redundancy group to the RAIDset. Located in the HSZ22 Monitor Utility is the Host Logical Unit Number (LUN) Mapping Sheet, which identifies a RAIDset/Redundancy Group as a LUN. This monitor utility must be used to alter the redundancy group information.

Always document and save your RA3000 RAID set configuration for future reference. Information on each RAID set and partition—the original LUN number, controller, and host port parameters—should be readily available if a problem occurs. Appendix A contains configuration sheets to help you in this process.



**CAUTION:** Perform this procedure only if previous methods to resolve LUN mapping problems have been unsuccessful. Deviating from the HSZ22 DEC monitor utility host LUN mapping menu risks entering menus where controller parameters can be altered creating data integrity problems, data loss, and possible malfunction of the controller. Compaq recommends that only experienced personnel use this procedure.

---

1. Stop the Agent as specified for your operating system.
2. Connect a serial cable from the PC's (or maintenance terminal's) COM ports to the corresponding serial ports (CTR1 and CTR2) on the storage system (one serial connection per controller).
3. Open a HSZ22 Monitor Utility terminal session for each controller. Ensure the terminal settings are: 9600 baud, 8 bits, No Parity, 1 stop bit, flow control XON/XOFF.
4. When the terminal session appears, press the **Escape** key, then press the **Shift+7** keys. The controller should respond with a banner listing HSZ22 Monitor Utility followed by the firmware revision number.
5. Enter RAID as the password and press the **Enter** key to access the main menu.
6. Scroll to Setup Parameters and press the **Enter** key.
7. Scroll to Host LUN Mapping and press the **Enter** key to display the host LUN Mapping property.



## HSZ22 Monitor Utility

### MAIN MENU

RAID Set Information	
Setup Para	Host Parameters
System Inf	System Parameters
RAID Set F	Host LUN Mapping
System Fun	Disk Parameters
Disk Util	Channel Settings
Rebuild/Cr	Rdnt Ctrlr Parameters
Event Log	

UP ARROW: CURSOR UP | DOWN ARROW: CURSOR DOWN | ENTER: SELECT |  
CTRL+Z: EXIT

8. Select the host channel to be configured, scroll to the LUNs that have lost their mapping. A dash (-) represents an unmapped redundancy group (refer to original configuration information).

**NOTE:** To prevent incorrect LUN mapping, verify the port connections on each controller. They should be recorded and saved from the original controller configuration.

**Host LUN Mapping Properties Sheet Example:**

HSZ22 Monitor Utility HOST LUN MAPPING  
Channel 0

Host LUN	Redundancy Group	Host LUN	Redundancy Group
0	-	16	-
1	-	17	-
2	-	18	-
3	-	19	-
4	-	20	-
5	-	21	-
6	-	22	-
7	-	23	-
8	-	24	-
9	-	25	-
10	-	26	-
11	-	27	-
12	-	28	-
13	-	29	-
14	-	30	-
15	-	31	-

N: NEXT CH | P: PREV CH | ENTER: SELECT | C: CLEAR | D: DEFAULT | CTRL+Z: EXIT

- From your documented configuration information, enter redundancy group numbers that correspond to the original LUN numbers for your virtual disks only. The StorageWorks Command Console creates a LUN and displays the LUN below the device in the Virtual Disks window. This is the number that must be entered to correctly map the redundancy group.
- Press the **Ctrl+Z** keys to save and exit.
- Allow the controllers to power-up and then re-boot the server.
- Open the StorageWorks Command Console and verify through Virtual Disk Properties sheet that all LUNS, host ports, and controllers have correct parameters.
- Restart the HSZ22 Agent in Services (refer to your platform-specific Getting Started guide for instructions on how to start the Agent if necessary).

**NOTE:** Channel 0 in HSZ22 Monitor Utility corresponds to Host Port 0 in StorageWorks Command Console, Channel 1 corresponds to Host Port 1.

## Host LUN Mapping Example

As shown below, redundancy groups 0–3 can be mapped to LUNs 4–7 on host channel 1 of the bottom controller.

### HOST LUN MAPPING

#### Channel 1

Host LUN	Redundancy Group
0	-
1	-
2	-
3	-
4	0
5	1
6	2
7	3
8	-
9	-
10	-
11	-
12	-
13	-
14	-
15	-

### HOST LUN MAPPING

#### Channel 1

Host LUN	Redundancy Group
16	-
17	-
18	-
19	-
20	-
21	-
22	-
23	-
24	-
25	-
26	-
27	-
28	-
29	-
30	-
31	-

N: NEXT CH | P: PREV CH | ENTER: SELECT | C: CLEAR | D: DEFAULT | CTRL+Z: EXIT

And, redundancy groups 4–7 can be mapped to LUNs 0–3 on host channel 0 of the top controller as shown in the following tables.

**HOST LUN MAPPING**

**Channel 0**

Host LUN	Redundancy Group
0	4
1	5
2	6
3	7
4	-
5	-
6	-
7	-
8	-
9	-
10	-
11	-
12	-
13	-
14	-
15	-

**HOST LUN MAPPING**

**Channel 0**

Host LUN	Redundancy Group
16	-
17	-
18	-
19	-
20	-
21	-
22	-
23	-
24	-
25	-
26	-
27	-
28	-
29	-
30	-
31	-

N: NEXT CH | P: PREV CH | ENTER: SELECT | C: CLEAR | D: DEFAULT | CTRL-Z: EXIT

**NOTE:** Note that the values of the redundancy group numbers do not exceed the total number of LUNs –8 LUNs are mapped using redundancy group numbers 0–7. The total number of LUNs available per controller is eight. In a dual-controller configuration, a maximum of 16 LUNs is available. The example above pertains to an eight LUN controller configuration.

The controllers are configured for Active/Active mode.

# *Appendix* **C**

## **Usage Notes and Troubleshooting**

This appendix describes the following general usage notes and tips for troubleshooting problems for Command Console Client and Agent:

- System Requirements
- General Usage Notes
- Troubleshooting Connection Problems

## System Requirements

This section describes the special considerations for various operating systems and Agents. It contains the following topics:

- Network Port Assignments
- Reconfiguration After Controller Replacement
- Requirements for TCP/IP Stacks on OpenVMS Version 7.2

## Network Port Assignments

SWCC Clients and Agents communicate by using sockets. The SWCC installation attempts to add entries into each system list of services (services file or for UCX, the local services database). In order for SWCC to operate the port names and numbers must match for all host and client systems on the network.

If the SWCC installation finds an entry in the local services file with the same name as the one it wants to add, it assumes the one already in the file is correct.

The SWCC installation may display a message, stating that it cannot upgrade the services file. This happens if it finds an entry in the local services file with the same number as the one it wants to add, but with a different name. In that case, appropriate port numbers must be obtained for the network and added manually to the services file.

There are two default port numbers, one for Command Console (4998) and one other for the device-specific Agent and Client software. The exception is the software for the RA200 Agent and Client, which has two (instead of one) default network port numbers.

The OpenVMS configuration files add the services entries, not the PCSI installation kit.

The following are the port names and the default numbers as they appear in the services file:

**Table C-1**  
**Network Port Assignments**

Spgui	4998/tcp	#Command Console
Ccdevmgt	4993/tcp	#Device and Enclosure Management Client and Agent
Emu	4990/tcp	#Environmental Monitoring Unit
Ccfabric	4989/tcp	#Fibre Channel Interconnect Client and Agent
Spagent	4999/tcp	#HS-Series Client and Agent
Ccagent	4997/tcp	#RA200 Client and Agent
Spagent2	4995/tcp	#RA200 Client and Agent
Spagent3	4994/tcp	#HSZ22 Client and Agent

Port names and numbers must be exactly the same for all systems that need to communicate with each other on the network, running SWCC.

## Reconfiguration After Controller Replacement

If you replace a controller in your subsystem, you must reconfigure your Agent's storage list to match the new hardware.

## Requirements for TCP/IP Stacks on OpenVMS Version 7.2

The following provides the requirements for TCP/IP stacks on OpenVMS version 7.2

**Table C-2**  
**Requirements for TCP/IP Stacks**

TCP/IP Stack	Minimum Version	Supported/ Not Supported	Notes
UCX	4.x	Not Supported	This stack is not supported under OpenVMS version 7.2
TCPIP (formerly UCX)	5	Supported	Minimum ARB_SUPPORT setting of 2. **
MultiNet	4.1B	Supported*	Minimum ARB_SUPPORT setting of 2. **
TCPware	5.3-3	Supported*	Minimum ARB_SUPPORT setting of 2. **

\* This stack requires a security patch from Process Software to support OpenVMS version 7.2. Go to [www.process.com](http://www.process.com).

\*\* If you have MultiNet and/or TCPware TCP/IP stacks on your computer, set ARB\_SUPPORT to less than 2. ARB\_SUPPORT is a security setting for OpenVMS version 7.2. For further information on ARB\_SUPPORT, please refer to your documentation on OpenVMS version 7.2.



## General Usage Notes

This section provides general information on the software to help you understand certain error messages. It contains the following topics:

- Authorization Error When Adding an Agent System
- Delayed Pager and Event Notification on RAS Connections
- Help Files Still Appear After Uninstall
- Increasing Screen Space for the Storage Window
- Invalid or Missing Fault Displays and Event Logs
- Pager Notification and Event Logging Continues After Exiting the Command Console Client
- Some Graphics Do Not Scale Well with Large Fonts
- Starting Client with Network Connections
- Storage Window Does Not Display Status Changes

### Authorization Error When Adding an Agent System

If you receive an authorization error when you add an agent system to the Navigation Tree, your client system may be missing from the Agent's list of client system entries. If you have more than one type of Agent installed on that agent system, the name of your client system must be on each Agent's list of client system entries.

## **Delayed Pager and Event Notification on RAS Connections**

Pager and event notification may be delayed significantly when multiple client systems are using Remote Access Service (RAS) connections. The Agent sends fault messages to each client system listed in the file that contains its list of client systems to notify when a fault occurs. Client systems that are not frequently connected to the network delay this process. The delay occurs because the Agent must wait for its connections to time out before notifying the other client systems.

Move your most important systems, such as the one that performs pager notification, to the top of the list of client systems in the configuration utility and the systems with RAS connections to the bottom. The Agent begins communicating to each client system from the top of this list. This will allow your more important systems to receive fault messages first.

You may also want to deselect the TCP/IP notification scheme for less important systems, especially for those using RAS connections. The Agent is prevented from sending fault messages to client systems without the TCP/IP notification scheme. The client systems that are not configured to receive TCP/IP notification will not update their Navigation Tree nor will they generate pager notification for that Agent.

## **Help Files Still Appear After Uninstall**

After you have uninstalled a storage subsystem Client, its help files will still appear. Delete the CCHSZ22.GID file, which may be hidden (Windows Explorer|View |Options|View).

## **Increasing Screen Space for the Storage Window**

It is highly recommended that you run the Client on a monitor that has a minimum of super VGA (SVGA) (800X600) display resolution because the Storage Window requires a certain amount of screen space to properly display its contents. When you use a VGA display resolution, screen space becomes more limited. If you must use a VGA resolution, select the Auto Hide check box in the Taskbar Properties window to increase screen space for the Storage Window.

## Invalid or Missing Fault Displays and Event Logs

Invalid or lost notifications may occur when the client system's connection with a subsystem is broken. The client system receives notification for most changing subsystem faults at monitored intervals. This means that if the client system is no longer notified of subsystem faults, then changes to that subsystem will not be displayed in the client system's Navigation Tree, Storage window, and Windows NT Event Viewer.

For example, while the client system's connection is broken with a subsystem, you will not receive event logs pertaining to that subsystem, except to say that the connection has been broken.

The following list provides the reasons for broken connections. After you have fixed the physical problem that is listed below, you will need to close and reopen the Storage Window to obtain the latest status.

- For RAS connections - Remote Access Service (RAS) connections are not full time. Events that occur when there is no RAS connection are not logged to the Windows NT Event Logging facility.
- For serial controller connections - There may be a bad or missing serial cable. To repair this situation, replace or plug in the cable.
- For host port SCSI connections - There may be a bad or missing SCSI host cable. There may be no logical units configured on the controller that was selected at the time of Client startup.
- For network connections - Agent may be missing or not running. There may be network discontinuity. The Agent may not be properly configured for your Clients.
- The controller may have halted, reset or hung - To repair this situation, restart or replace the controller.
- The virtual disk being used for communicating with the subsystem is no longer available.

## **Pager Notification and Event Logging Continues After Exiting the Command Console Client**

You may experience continuous paging notification and Windows NT event logging in response to subsystem faults, even though you have exited Command Console Client. This behavior is normal. It is the result of Client starting the paging and event logging activity while it was running.

Client's asynchronous event service (AES) module runs under Windows NT and Windows 2000 as a service. It continues to run, even after you have exited the program. The AES module communicates with Agents, and it activates paging and event logging when a subsystem event occurs.

**NOTE:** When you stop AES on a client system, you are telling the Agent software to no longer send updates to that client system.

To stop paging and event logging on a client system, perform the following for Windows NT:

- Go to Start|Settings|Control Panel|Services. Select AsyncEventSvc (stands for asynchronous event service), and then click **Stop**.

## **Some Graphics Do Not Scale Well with Large Fonts**

It is recommended that small fonts be displayed when using the SWCC client software on Windows NT and Windows 2000. Some of the graphics do not scale as well when large fonts are used.

## Starting Client with Network Connections

To start Command Console Client with network connections to your storage subsystems, click StorageWorks Command Console in Start|Programs|Command Console.

You can also type the following line at a command prompt on Windows NT and Windows 2000 to start the Client with network connections:

```
\path_to_client_directory\swcc.exe -d your_host_system your_host_subsystem
```

where `-d your_host_system your_host_subsystem` is an optional set of parameters that enables you to specify a system and a subsystem to start Client. If you specify these parameters, Client opens with the system selected and the subsystem displayed in the Storage Window. If Client is not already aware of the system and the subsystem, it adds them to the Navigation Tree.

## **Storage Window Does Not Display Status Changes**

When a Storage Window loses a connection with a subsystem, it is unable to display that subsystem's change of status. This is because the Storage Window receives notification for most changing subsystem conditions at monitored intervals.

For example, while the client system's connection is broken with a subsystem, the Storage Window may display old faults that were cleared.

The following list provides the reasons for broken connections. After you have fixed the physical problem that is listed below, you will need to close and reopen the Storage Window to obtain the latest status.

- For RAS connections - Remote Access Service (RAS) connections are not full time. Events that occur when there is no RAS connection are not logged to the Windows NT Event Logging facility.
- For serial controller connections - There may be a bad or missing serial cable. To repair this situation, replace or plug in the cable.
- For host port SCSI connections - There may be a bad or missing SCSI host cable. There may be no logical units configured on the controller that was selected at the time of Client startup.
- For network connections - Agent may be missing or not running. There may be network discontinuity. The Agent may not be properly configured for your Clients.
- This controller may have halted, reset or hung - To repair this situation, restart or replace this controller.

## HS-Series Agent Interaction

If you have an HSZ22 controller connected to a system, the HS-Series Agent for Tru64 UNIX and Windows NT will identify the HSZ22 controller as an HSZ20 whenever it scans for subsystems. These Agents scan for subsystems in two instances. One is during the installation of Tru64 UNIX or Windows NT. The other instance is when you request that an Agent scan for subsystems. There are two ways to handle this interaction:

- Avoid the problem - Shut off the HSZ22 controller during the HS-Series Agent installation. After the installation, turn on the HSZ22 controller and reboot the system.
- Repair the problem - During the installation of the HS-Series Agent, delete the erroneous entry. The installation runs the Agent configuration utility. The second screen of the configuration utility lists the subsystems found during the installation. The HSZ22 entry can be identified by its serial number, by its firmware version, and by the drive used to access the subsystem.

## Troubleshooting Connection Problems

This section documents known connection problems and suggests some solutions. SWCC is a TCP/IP socket-based application. As a result, SWCC requires that each node running a SWCC Client or Agent must have access to a valid hosts file or Domain Name Service (DNS) server. The valid hosts file must include at least the system itself and any other systems running a SWCC Client or Agent that it will connect to.

Make sure the system names used for the Client and Agent match each other consistently. As a general rule, always use lowercase letters when entering names.

### Access Denied Problem

This section covers some of the most common reasons for a Client to receive an “Access Denied” message when it attempts to add an agent system to the Navigation Tree.

### Aliases Not Checked

When SWCC Agents scan the Client authorization list, they do not check aliases. The entry in the Client authorization list must match that returned by a `gethostbyaddr` call in the `hostent h_name` field. SWCC will not scan the `hostent` alias list to check if an alias may match the Client authorization list.

### Client System Not on Agent's List

The client system may not be on the authorized client system list for the Agent.

### Entry in the Client Authorization List Does Not Match

Generally, the entry in the Client authorization list for an Agent must match what `gethostbyaddr(<client IP address>)` will return in the `hostent h_name` field when `gethostbyaddr(<client IP address>)` is executed on the Agent system. If hosts files are not exactly the same on all systems, the `h_name` returned may vary on different Agent systems. For example,

```
xxx.xxx.xxx.xxx    client.somewhere.com    client
```

will return `client.somewhere.com` in the `h_name` field, but

```
xxx.xxx.xxx.xxx    client                client.somewhere.com
```

will return `client` in the `h_name` field.

In some situations, you can configure the way a system uses DNS and its local hosts file. Please refer to your system documentation to find how your system is configured. Some systems may be configured to do the following:

- Check its local hosts file first, then go to DNS.
- Go to DNS first, then check its local hosts file.
- Ignore DNS even if configured.
- Ignore the local hosts file.

The best way to verify what needs to be used for a Client name in the Client authorization list is to write a program that runs on the agent system and prints the `h_name` field returned by `gethostbyaddr(<client IP address>)`. Remember, the dynamic IP address allocation is not supported.



## Multiple Agents

If the agent system is running multiple SWCC Agents (for example, to support different controller types) then the client system must be authorized for all Agents. If the client system is missing from any authorized Client list of an Agent, then that Agent cannot be added to the Navigation Tree.

## Add New System by Using Internet Protocol Address May Cause Client to Stop Responding

The SWCC Client may stop responding when you attempt to add a system by using the agent system's IP address rather than the agent system's node name. This occurs when the client system does not have a DNS server configured that knows the agent system, and the agent system is not in the client system's hosts file. To correct this situation, add the agent system to the hosts file on the client system.

If you receive an "Invalid host" or "Host not known" message when you attempt to connect to an agent system, the solution is not to try the IP address. Fix your DNS server configuration, or if that is correct, confirm the DNS server knows the agent system. If you are not using DNS, make sure the agent system is in the client system's hosts file. Remember that WINS is not supported by SWCC.

## "No Agent Running" Message When Adding System to the Navigation Tree

When trying to add a new system to the Navigation Tree, you may receive a message, stating "No Agent running on specified system." This message can appear for several reasons. The error most likely occurred as a result of one of the following:

- Wrong system name was entered.
- Agents were not installed on the entered system.
- Agents were installed on a system that stopped functioning.

- The specific Client required to support the Agents, running on the agent system, was not installed. For example, if the agent system only has a Fibre Channel Interconnect Agent and the client system has only an HSZ22 Client, the “No Agent Running” message will appear.

To check if Client support for an Agent had been installed, look at the following registry key:

```
HKEY_LOCAL_MACHINE\Software\DigitalEquipmentCorporation\  
Command Console\AppletManager\HSZ22
```

- Port names and numbers in the services file may be missing or may not match between Client and Agent. This may occur if the default value for a SWCC port was already in use. There is a list of port numbers and their default values in “Network Port Assignments”
- If you have entered the host name in the hosts file, verify that it is spelled correctly and that it is in lowercase letters. The host name is not required in this file, but TCP/IP will look here first when resolving host names. The hosts file is on the client system in the following directory:

On Windows NT - \winnt\system32\drivers\etc

Make sure you have the correct port numbers in the client’s services file. See the section “Network Port Assignments” Make sure the Command Console Agent on the host system is using a correct host name to recognize the Client. If the host system is Windows NT, run the Agent Configuration Utility (H22AgtCfgWiz.exe) or examine the client.ini file on the host system. On other host systems, look at the client.ini file.

- If you are using a Windows NT Client, run netstat at the MS-DOS prompt to check the TCP/IP active connections.
- Check the Client name that the Agent’s host system sees is the same as the name specified in the Agent’s client.ini file. Run netstat at the MS-DOS prompt on the Agent, if you are using a Windows NT host system, and check the TCP/IP active connections.
- Make sure the Agent’s host system has been configured to recognize the Client by its assigned name rather than by an alias name. If the host system has been configured to recognize the Client by an alias name, remove the alias name from the system’s “hosts” file.

**NOTE:** Always reboot the Client system after making changes to the hosts or services file.

## Windows NT Event Logging

The HSZ22 Agent gathers traps obtained from the subsystems. The Agent puts the traps in the Application Log of the Windows NT Event Viewer program (Start|Programs|Administrative Tools|Event Viewer) that resides on its computer and on the client systems that it notifies (Event Viewer is on Windows NT operating systems only). To view these traps, go into the Application Log (Log|Application) in the Event Viewer. The events for your subsystems and Agent will be listed under the sources: AsyncEventSvc and HSZ22 Agent. You can obtain additional details of an event, by double-clicking its entry. For your client system to receive traps, the Asynchronous Event Service (AES) needs to be running on that computer. To start AES, do the following:

Windows NT - Go to (Start|Settings|Control Panel|Services). Select **AsyncEventSvc** (stands for Asynchronous Event Service), and then click **Start**



**CAUTION:** To receive traps in the Application Log of the Windows NT Event Viewer of the client system, the following must occur:

- The Asynchronous Event Service (AES) must be running.
  - The Agent service must be running.
  - In the Agent's list of client system entries, you must select the TCP/IP notification scheme for your client system.
-

## **Troubleshooting with a SCSI Connection**

Command Console Client may indicate that it cannot find your subsystem if you attempt to connect via the host SCSI port in either of the following situations:

- A storage subsystem is connected to the host, but the subsystem has no volumes configured on it.
- A storage subsystem is not connected to the host.

To avoid the problem, a Controller Subsystem with at least one volume configured on it must be connected to the host before you attempt to connect CC Client.

Your subsystem may have been shipped with at least one virtual disk configured on it to facilitate connection over the host SCSI bus. If your subsystem has no virtual disks configured on it, you must temporarily establish a serial connection to your RAID Array 3000 and create one using Command Console Client.

You cannot make a network connection to any subsystem via Agent unless at least one virtual disk has been created on the subsystem