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*Storage***Works** 

**RA7000 / ESA10000
MultiHost High Availability
Solutions for Sun**

Installation Guide

EK-HASUN-MH. A01

1st Edition, April 1998

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Revision Record

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

The following revision history lists all revisions of this publication and their effective dates. The publication part number is included in the Revision Level column, with the last entry denoting the latest revision. This publication supports the StorageWorks RA7000 / ESA10000 Subsystem configured with or without a Hub interconnect to two Sun host servers running Solaris 2.5.1 or 2.6 operating systems and containing either HD68-pin or VHDCI host adapters. VERITAS FirstWatch (Release 2.2.4) is the high availability software supported by this publication.

Revision Level	Date	Summary of Changes
EK-HASUN-MH. A01	April 1998	Original release.

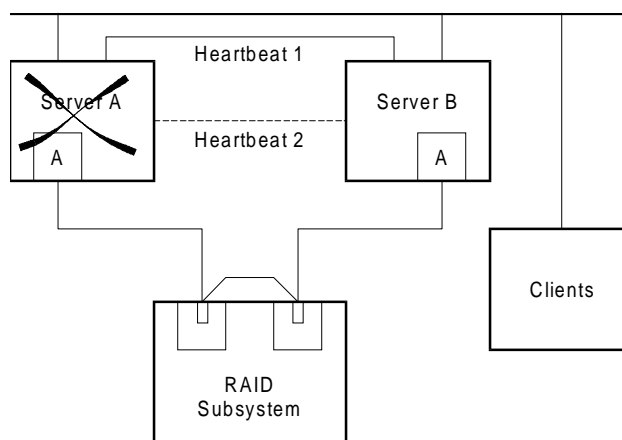
About This Guide

This section provides an overview of MultiHost High Availability (MHHA), and defines the scope and conventions of this guide. It identifies associated reference documentation, and the StorageWorks sales, service, and technical support contacts worldwide.

An Overview of RAID MultiHost High Availability for Sun

RA7000 / ESA10000 MultiHost High Availability for Sun enables two Sun host servers to share a RAID storage subsystem through a SCSI bus, with VERITAS FirstWatch high availability software. Should a failure on a server occur, the failure is detected and the I/O is re-routed through to the functioning server. This process, called failover, requires no resource downtime - ensuring the high availability of data. The failed component(s) can be warm-swapped or serviced while functioning components remain active.

Figure 1 MultiHost High Availability Concept



SHR-1024-

Audience

This guide is intended for administrators and system integrators of Sun host server and StorageWorks RA7000 / ESA10000 subsystem equipment. Enabling MultiHost High Availability requires a general understanding of Sun server networks, RAID storage concepts, high availability software and UltraSCSI hardware configurations. Or, contact your service representative for installation assistance.

Document Structure

This guide contains the following chapters:

Getting Started

This section provides a roadmap to serve as the master procedural guide for enabling MultiHost High Availability.

Chapter 1: Pre-Installation Steps

This chapter addresses the preparation needed before installing and configuring the RAID MultiHost High Availability components. It provides a guide to your options in planning the layout of the shared RAID subsystem, the two host servers and, if applicable, the hub, through the UltraSCSI bus. It provides procedures to prepare host adapters (when hubs are not in use), so disconnection of failed components from the bus can occur without disrupting the active bus. This chapter also describes how to set unique SCSI host adapter IDs - mandatory for Multihost High Availability.

Chapter 2: Cabling the RAID Subsystem Components for MultiHost High Availability

This chapter describes the procedures for cabling the RAID subsystem based on the UltraSCSI layout option selected in *Chapter 1* of this guide. It provides detailed illustrations of the cabling and termination required to support VHDCI and HD68-pin host adapter compatibility, and the use of a hub.

Chapter 3: Software Setup Requirements for MultiHost High Availability

This chapter identifies the software setups required to enable Multihost High Availability. It directs you to the procedures to install the RAID Manager software, create the RAID subsystem storage configurations, and to install and configure VERITAS FirstWatch high availability software. This chapter also describes how to initiate a "FirstWatch agent" to manage the failover of the RAID Manager (SWCC) module.

Associated Documents

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

Table 1 Associated StorageWorks and VERITAS Documents

DIGITAL StorageWorks Document Title	Order Number
<i>Getting Started - HSZ70 Solutions Software V7.0b for Solaris 2.x</i>	AA-R60VB-TE
<i>Release Notes - RAID Array 7000/Enterprise Storage Array 10000 for Sun Solaris</i>	AA-R60WB-TE
<i>RA7000 and ESA10000 Storage Subsystems</i>	EK-SMCP-UG
<i>Configuring Your StorageWorks Subsystem HSZ70 Array Controllers Version 7.0</i>	EK-HSZ70-CG
<i>Servicing Your StorageWorks Subsystem HSZ70 Array Controllers HSOFF Version 7.0</i>	EK- HSZ70-SV
<i>16-Bit SCSI Bus Hub (DWXXH)</i>	EK-DWZZH-UG
<i>SWCC Command Console 2.0</i>	AA-R60EA-TE
<i>CLI Reference Manual HSZ70 Array Controllers HSOFF Version 7.0</i>	EK-CLI70-RM
VERITAS FirstWatch Document Title	
<i>VERITAS Firstwatch Installation and Configuration Guide for Solaris (Release 2.2.4)</i>	(order info below)
<i>VERITAS FirstWatch for DIGITAL StorageWorks RA7000 or ESA10000 Application Note</i>	(order info below)

To Order VERITAS products

To order VERITAS FirstWatch high availability software and documentation, contact your local sales representative, or contact the VERITAS Customer Support hotline:

US Customers: 1-800-342-0652

International Customers: +1 (650) 335-8555

VERITAS Customer Support can also be reached through electronic mail at:

support@veritas.com

Conventions

In this guide, references to *StorageWorks RAID Array, controller, or subsystem* pertain to the following:

- Raid Array RA7000
- Enterprise Storage Array ESA10000

This guide uses the following documentation conventions:

Table 2 Style Conventions

Style	Meaning
boldface monospace type	To be input by the user.
<i>italic type</i>	For emphasis, manual titles, utilities, menus, screens, and filenames.
plain monospace type	Screen text.
#	Represents the Solaris system prompt. Do not type it as part of information to be input by the user.

Support and Services

Who to contact in the Americas

Information and Product Questions:	Local Sales Office / StorageWorks Hotline 1-800-786-7967
Installation Support:	Contact the DIGITAL Distributor where the Storage Solution was Purchased / Local DIGITAL Sales Office.
DIGITAL Multivendor Customer Service (MCS)	
Installation	Contact the DIGITAL Customer Support Center (CSC).
Warranty	Contact the DIGITAL Customer Support Center (CSC) for warranty service after solution is installed and operating.
Remedial	Contact the DIGITAL Customer Support Center (CSC).
	Note: A Service Contract is recommended when the equipment is out of warranty. Contact the local DIGITAL Sales Office.
Customer Support Center (CSC)	1- 800-354-9000

Who to contact in Europe

Information and Product Questions, Installation Support, and Installation:	Contact the DIGITAL Distributor or reseller from whom the Storage Solution was purchased.
For Warranty Service	See the Warranty Card packaged with the product.
For Remedial Service	Contact the DIGITAL Distributor or reseller from whom the Storage Solution was purchased.
	Note: A Service Contract is recommended when the equipment is out of warranty.

Who to contact in Asia Pacific

For all services, contact the DIGITAL Distributor or reseller from whom the equipment was purchased.

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

Getting Started

This section contains a roadmap to serve as your master guide for enabling Multihost High Availability between two Sun host servers and a shared RAID subsystem. This roadmap presides over all other documentation supplied with your equipment, and refers to those resources as increased technical depth is required.

RAID MultiHost High Availability for Sun

- - - - - RoadMap - - - - -

STEP	PERFORM THIS PROCEDURE...	DESCRIBED IN...
□ 1	All Pre-Installation steps, Including... <ul style="list-style-type: none"> ◇ Verify System Requirements ◇ Verify Connection Kit Contents ◇ Perform a System Backup ◇ Plan RAID Subsystem Cabling Layout ◇ Prepare the Host Adapters ◇ Set SCSI Host Adapter IDs 	<i>RA7000 / ESA10000 MultiHost High Availability Solutions for Sun - Chapter 1</i>
□ 2	Unpack and Setup the RAID	<i>Getting Started HSZ70 Solutions Software V7.0b for Solaris 2.x – Chapter 1 or 2</i>
□ 3	Cable/Terminate the RAID Subsystem Components	<i>RA7000 / ESA10000 MultiHost High Availability Solutions for Sun – Chapter 2</i>
□ 4	Install the RAID Manager (SWCC) Software	<i>Getting Started HSZ70 Solutions Software V7.0b for Solaris 2.x – Chapter 3</i>
□ 5	Create the RAID Storage Configuration	<i>Getting Started HSZ70 Solutions Software V7.0b for Solaris 2.x – Chapter 6 or 7 and Appendix B</i>
□ 6	Install VERITAS FirstWatch Software	<i>VERITAS FirstWatch Installation and User Guide for Solaris (Release 2.2.4)</i>
□ 7	Install a FirstWatch Transition Module for RAID Manager (SWCC) Failover	<i>RA7000 / ESA10000 MultiHost High Availability Solutions for Sun – Chapter 3</i>

1

Pre-Installation Steps

This chapter addresses the preparation needed before installing and configuring the RAID MultiHost High Availability (MHHA) components.

The pre-installation steps required to support multihost high availability are as follows:

- Verify the System Requirements
- Inventory the SCSI Connection Kit
- Perform System Backups
- Plan the RAID Subsystem Component UltraSCSI Bus Interconnection
- Prepare the Host Adapter Boards

1.1 Verify MultiHost High Availability System Requirements

Please verify that the high availability requirements listed in Table 1-1 are met.

Table 1–1 MultiHost High Availability Prerequisites

Host Feature	Requirement
Platform	Two Sun SPARC host servers
Operating System	Sun Solaris, version 2.5.1 or 2.6
Software	VERITAS FirstWatch high availability software (2.2.4)
Free Disk Space	500KB on each server for VERITAS FirstWatch software
Storage Subsystem	StorageWorks RA7000 or ESA10000 RAID subsystem
Controller Compatibility	Two StorageWorks HSZ70 controllers per RAID subsystem, trilinked, running operating firmware V7.0b
Adapter Compatibility	Two Sun Sbus X1065A host adapters, (one per server) or Two Sun PCI X6541A host adapters, (one per server)
Additional Items	Requirement
RAID SCSI Connection Kit	Complete RAID SCSI Connection Kit (See Table 1-2)
RAID Hardware	Cables supplied with RAID subsystem (kit DS-SWXRA-xx)
Service Tools	Appropriate tools to service your equipment
Technical Documentation	The reference guides for the StorageWorks RAID subsystem, the Sun servers and the VERITAS FirstWatch software supplement this installation guide.

NOTES

1. All of the host features that are supported by the platform kit are also supported in the multi-host environment
2. The installation of a hub requires a 3.5" SSB slot available in your StorageWorks pedestal or shelf.

1.2 Inventory the RAID SCSI Connection Kit

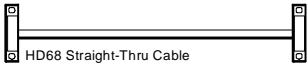
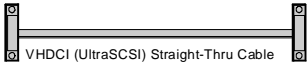
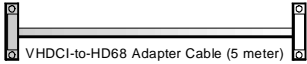
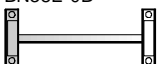
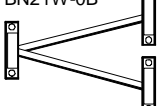
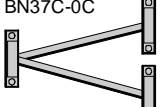


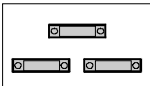
Three types of RAID SCSI Connection Kits exist. The part numbers and purpose served by each kit is as follows:

- **SWXKT-DE** – for connecting the RAID subsystem to servers having *HD68-pin host adapters*.
- **SWXKT-DF** – for connecting the RAID subsystem to servers having *VHDCI (UltraSCSI) host adapters*
- **SWXKT-EA** – for connecting the RAID subsystem through a hub to servers having either *HD68-pin or VHDCI host adapters* (both adapters must be the same type)

Please verify that the connection kit you have received is specific to your high availability needs, and use Table 1-2 to inventory its contents. Also, reference the *NOTES* following Table 1-2 to locate the components supplied with your RAID subsystem that supplement the RAID SCSI Connection Kit.

If you are missing any hardware component required for high availability, please contact your local sales representative or call the StorageWorks Hotline at 1-800-STORWRK (786-7975).

Table 1–2 RAID SCSI Connection Kit Contents (listed by kit number)

RAID SCSI Connection Kit Parts Identification	Kit SWXKT-DE	Kit SWXKT-EA	Kit SWXKT-DF
BN21K-05  HD68 Straight-Thru Cable	1		
BN37A-05  VHDCI (UltraSCSI) Straight-Thru Cable		2	1
BN38C-05  VHDCI-to-HD68 Adapter Cable (5 meter)	1	1	1
BN38E-0B  VHDCI-to-HD68 Adapter Cable		2	1
BN21W-0B  HD68-Pin Y-Cable	2		
BN37C-0C  VHDCI Y-Cable			2
H879-AA  HD68 M Differential Terminator	2		
H8863-AA  VHDCI M Differential Terminator			2
DS-DWZZH-03  3-Port Differential Hub		1	

NOTES

- Above, VHDCI (UltraSCSI) parts are shaded; HD68-Pin (fast, wide SCSI) are white.
- To supplement the RAID SCSI Connections Kit, please locate the following parts supplied with your RAID subsystem:
 - One BN37A-05 VHDCI UltraSCSI straight-thru cable (RA7000)
 - One BN38E-0B VHDCI-to-HD68-Pin Adapter cable (RA7000 / ESA1000)

1.3 Perform a System Backup

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

1.4 Plan the RAID Subsystem Component UltraSCSI Bus Interconnect

To plan the layout of components through the UltraSCSI bus, first define the two ends of the UltraSCSI bus by selecting *where you want to locate the RAID* subsystem on the bus relative to the other components (the two Sun hosts and, if applicable, the Hub). Determining the RAID location depends on your preference or any physical limitations of your facility (see “*Note*” below). You can locate the RAID subsystem:

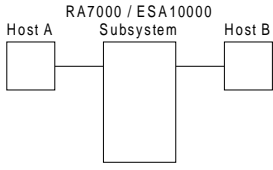
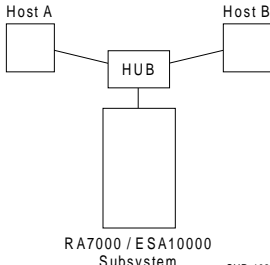
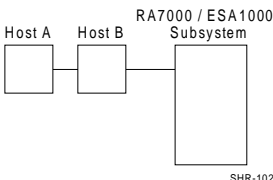
- In the middle of the UltraSCSI bus - (Mid-Bus RAID)
- Radiating from a Hub - (Hub-Radiant RAID)
- On an end of the UltraSCSI bus - (End-Bus RAID)

NOTE

The maximum bus length for a mid-bus or an end-bus RAID layout is 25M (*include* the Y-cable length when calculating total bus length).

For a hub-radiant RAID layout, the maximum distance of each radial arm (from the hub to a device) is 25M.

Table 1–3 RAID Subsystem UltraSCSI Cabling Layout Options

For This RAID/UltraSCSI Layout Option	And This Type of Host Adapter...	Reference This Section & Figure	
Mid-Bus RAID	HD68-Pin	2.2	2–1
Mid-Bus RAID	VHDCI	2.3	2–2
 <p>SHR-1021 Mid-Bus RAID</p>			
For This RAID/UltraSCSI Layout Option	And This Type of Host Adapter...	Reference This Section & Figure	
Hub-Radiant RAID	HD68-Pin	2.4	2–3
Hub-Radiant RAID	VHDCI	2.5	2–4
 <p>SHR-1023 Hub-Radiant RAID</p>			
For This RAID/UltraSCSI Layout Option	And This Type of Host Adapter...	Reference This Section & Figure	
End-Bus RAID	HD68-Pin	2.6	2–5
End-Bus RAID	VHDCI	2.7	2–6
 <p>SHR-1022 End-Bus RAID</p>			

Use Table 1-3 to select the layout that best suits your environment, including the type of host adapters in your servers (see Section 1.5, *Prepare the Host Adapters*). Then, reference the corresponding area in Chapter 2, *Cabling the RAID Subsystem Components for MultiHost High Availability* to proceed with the installation.

1.5 Prepare the Host Adapters

Each host server requires at least one SCSI host adapter be installed.

- If the SCSI host adapters are Sun X1065A (HD68-Pin) **and** part of a *mid-bus* or *end-bus* RAID layout, the resistor packs (terminators) on-board the adapters must be removed prior to UltraSCSI bus interconnection. (This procedure, in conjunction with installing a terminator on each Y-cable, as described in Chapter 2, permits UltraSCSI bus disconnection from a host server to occur without disrupting activity on the active UltraSCSI bus).

NOTE

Termination settings are determined automatically in Sun PCI X6541A (VHDCI) host adapters - there are no resistor packs to be removed.

- For *all SCSI host adapters*, (regardless of model or the configuration layout), unique SCSI host adapter IDs must be set to support high availability.

The procedures for removing resistor packs and for setting unique SCSI host adapter IDs are contained in the following sections.

1.5.1 Host Adapter Resistor Pack Removal

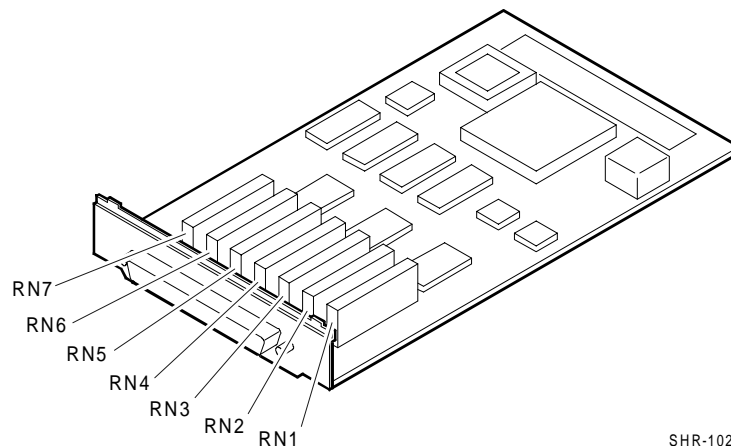
NOTE

Do not remove host adapter resistor packs in hub-radiant RAID layouts.

Remove the resistor packs from X1065A host adapters in mid-bus or end-bus RAID layouts to deactivate on-board termination as follows:

1. Follow normal procedures to shutdown both servers.
2. If applicable, consult the system manual to remove the cover of the server cases and remove the X1065A host adapter boards from both host servers.
3. Use Figure 1-1 to locate the resistor packs on the host adapter boards.
4. Gently pull to remove resistors RN1 through RN7 from the host adapter boards.
5. Replace the host adapter boards into the servers.
6. Reboot the servers and refer to the following section to set unique SCSI host adapter IDs.

Figure 1-1 Resistor Pack Locations on Sun X1065A Host Adapters
(To be removed in *mid-bus* or *end-bus* RAID configurations)



SHR-1025

1.5.2 Set Unique SCSI Host Adapter IDs

It is mandatory for multihost high availability that each server have a unique SCSI host adapter ID (target ID).

Change the SCSI host adapter ID on one (only) of your servers to an unused number. This ensures each server has a different target ID number.

NOTE

Be sure to select a target id that is not in use by
ANY device on the server

To view currently used SCSI target IDs, type the following at the eeprom prompt:

```
ok probe-scsi-all
```

For example, if you are not using initiator ID number 5 on one server, type:

```
ok setenv scsi-initiator-id 5
```

The host adapters are now prepared for multihost high availability.

2

Cabling the RAID Subsystem Components for MultiHost High Availability

This chapter provides the procedures for interconnecting two Sun host servers and a shared StorageWorks RAID subsystem through the UltraSCSI bus, and externally terminating the bus as applicable. Interconnection procedures for locating the RAID subsystem in a Mid-Bus, Hub-Radiant and End-Bus layout are provided, based upon the host adapter (HD68-pin or VHDCI) compatibility of the host servers.

2.1 Connecting RAID Subsystem Components through the UltraSCSI Bus

Based on the RAID subsystem UltraSCSI layout option you have selected and the type of host adapters you will use, locate the procedures in this section (cross-referenced in Chapter 1, *Table 1-1* of this guide), to cable and terminate the high availability components through the UltraSCSI bus.

NOTES

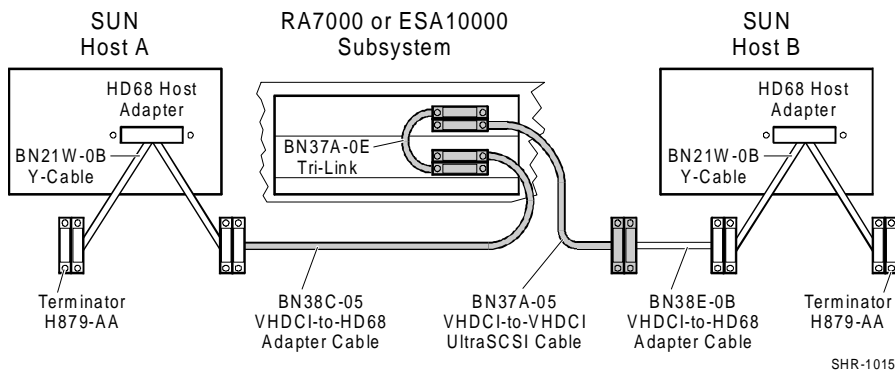
- Follow normal procedures to power off your two servers prior to cabling.
- For clarity in Figures 2-1 through 2-6, the *VHDCI* UltraSCSI cables and terminators are shaded and the HD68-pin (fast, wide SCSI) components are white.
- Cables and terminators supplied with your RAID subsystem supplement the components in your *RAID SCSI Connection Kit*. (See Chapter 1, *Table 1-2*).
- The following procedures assume that the host adapters have been prepared as described in Chapter 1.

2.2 Mid-Bus RAID Subsystem and HD68-Pin Host Adapter UltraSCSI Interconnect

To connect two Sun hosts equipped with HD68-pin host adapters on the two ends of the UltraSCSI bus (e.g., mid-bus RAID layout), with a RAID subsystem, reference Figure 2-1 and follow these steps:

1. Attach a Y-cable (BN21W-0B) to the HD68-pin host adapter on Host A.
2. Attach a Y-cable (BN21W-0B) to the HD68-pin host adapter on Host B.
3. Attach (compatible) end of a 5M adapter cable (BN38C-05) to one end of the Y-cable attached to Host A.
4. Connect the other end (VHDCI compatible) of the adapter cable to the end of a tri-link connector on a subsystem controller.
5. Attach (compatible) end of the short adapter cable (BN38E-0B) to one end of the Y-cable attached to Host B.
6. Connect the other end (VHDCI-compatible) of the adapter cable to the end of UltraSCSI cable BN37A-05.
7. Remove the terminator that occupies the tri-link connector on the subsystem controller.
8. Attach the remaining end of the VHDCI UltraSCSI cable attached to Host A to the available tri-link connector on the subsystem controller.
9. Connect a terminator (H879-AA) to the available end of the Y-cable on Host A, and to the available end of the Y-cable on Host B.

Figure 2-1 Mid-Bus RAID and HD68-Pin Host Adapter UltraSCSI Interconnect

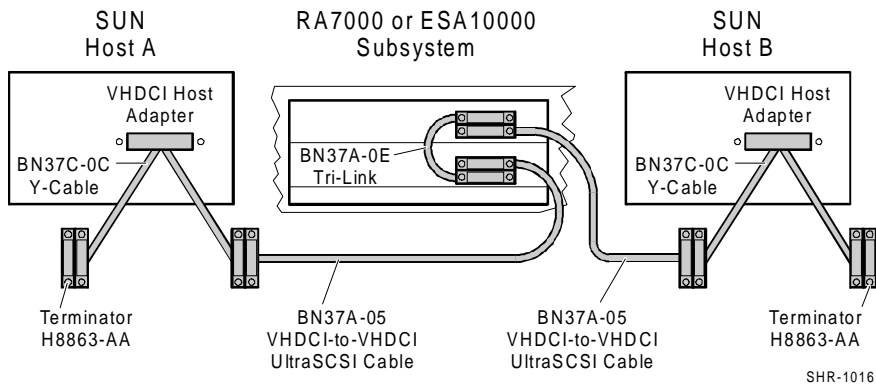


2.3 Mid-Bus RAID Subsystem and VHDCI Host Adapter UltraSCSI Interconnect

To connect Sun hosts equipped with VHDCI host adapters on the two ends of the UltraSCSI bus with a RAID subsystem, reference Figure 2-2 and follow these steps:

1. Attach a Y-cable (BN37C-0C) to the VHDCI host adapter on Host A.
2. Attach a Y-cable (BN37C-0C) to the VHDCI host adapter on Host B.
3. Attach end of an UltraSCSI cable (BN37A-05) to one end of the Y-cable attached to Host A.
4. Connect the other end of the UltraSCSI cable to an end of a tri-link connector on a subsystem controller.
5. Attach one end of an UltraSCSI cable (BN37A-05) to one end of the Y-cable attached to Host B.
6. Remove the terminator that occupies the tri-link connector on the RAID subsystem controller.
7. Connect the other end of the UltraSCSI cable to the available tri-link connector on the subsystem controller.
8. Connect a terminator (H8863-AA) to the available end of the Y-cable on Host A, and to the available end of the Y-cable on Host B.

Figure 2-2 Mid-Bus RAID and VHDCI Host Adapter UltraSCSI Interconnect

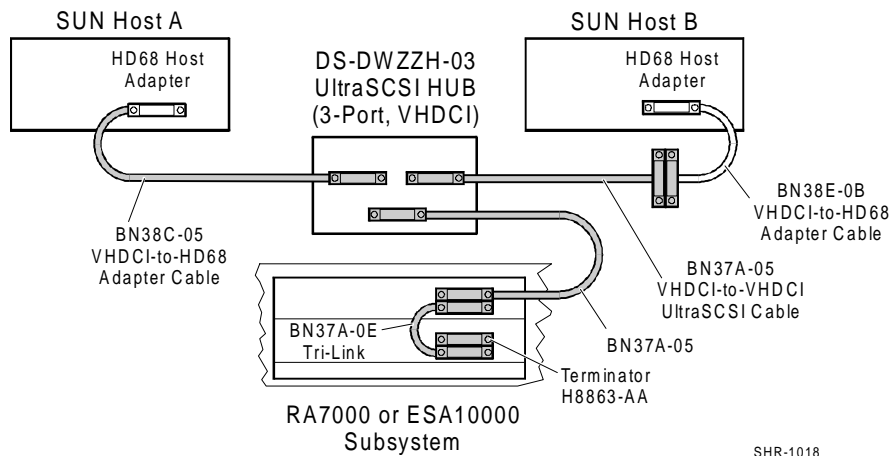


2.4 HUB-Radiant RAID Subsystem and HD68-Pin Host Adapter UltraSCSI Interconnect

To connect Sun hosts equipped with HD68-pin host adapters to a RAID subsystem via use of a Hub, reference Figure 2-3 and follow these steps:

1. Attach (compatible) end of the 5M adapter cable (BN38C-05) to the HD68-pin host adapter on Host A.
2. Connect the other end of the adapter cable to a convenient hub port.
3. Attach the compatible end of the short adapter cable (BN38E-0B) to the HD68-pin host adapter on Host B.
4. Connect the other end of the short adapter cable to the end of an UltraSCSI cable (BN37A-05).
5. Attach the remaining end of the UltraSCSI cable to a convenient hub port.
6. Connect one end of an UltraSCSI cable (BN37A-05) to a subsystem controller.
7. Attach the other end of the UltraSCSI cable to the remaining hub port.
8. Connect a terminator (H8863-AA) to the remaining tri-link connector on the subsystem controller.

Figure 2-3 Hub-Radiant RAID Subsystem and HD68-Pin Host Adapter UltraSCSI Interconnect



NOTE

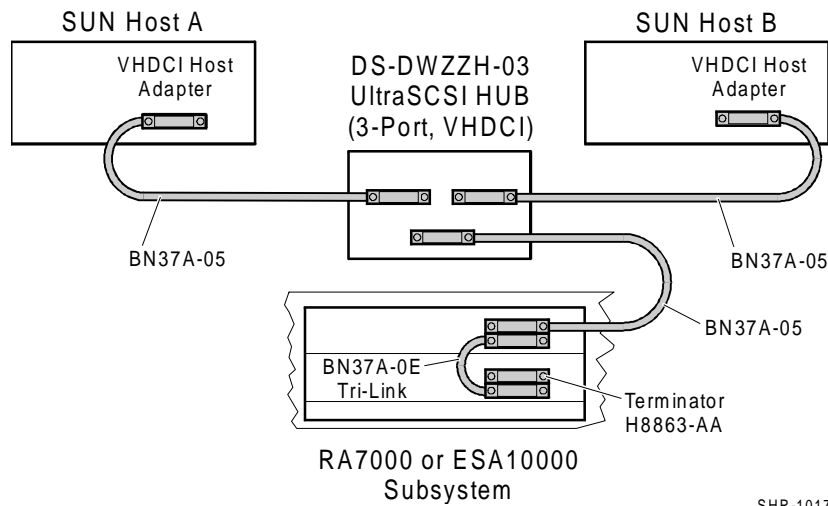
In hub configurations, termination is internal to the hub.

2.5 Hub-Radiant RAID Subsystem and VHDCI Host Adapter UltraSCSI Interconnect

To connect two Sun hosts equipped with VHDCI host adapters to a RAID subsystem via use of a Hub, reference Figure 2-4 and follow these steps:

1. Attach one end of an UltraSCSI cable (BN37A-05) to the VHDCI host adapter on Host A.
2. Attach the other end of the UltraSCSI cable to a convenient hub port.
3. Attach one end of an UltraSCSI cable (BN37A-05) to the VHDCI host adapter on Host B.
4. Connect the other end of the UltraSCSI cable to a convenient hub port.
5. Attach one end of an UltraSCSI cable (BN37A-05) to a subsystem controller.
6. Connect the other end of the UltraSCSI cable to the remaining hub port.
7. Connect a terminator (H8863-AA) to the available tri-link connector on the subsystem controller.

Figure 2-4 Hub-Radiant RAID Subsystem and VHDCI Host Adapter UltraSCSI Interconnect



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NOTE

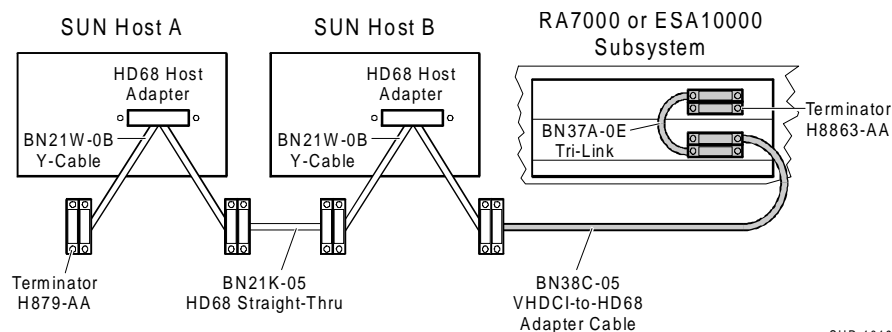
In hub configurations, termination is internal to the hub.

2.6 End-Bus RAID Subsystem and HD68-Pin Host Adapter UltraSCSI Interconnect

To connect two Sun hosts equipped with HD68-pin host adapters to a RAID subsystem located on the end of the UltraSCSI bus, reference Figure 2-5 and follow these steps:

1. Attach a Y-cable (BN21W-0B) to the HD68-pin host adapter on Host A.
2. Attach a Y-cable (BN21W-0B) to the HD68-pin host adapter on Host B.
3. Attach one end of the HD68-pin straight-thru cable (BN21K-05) to a convenient end of the Y-cable attached to Host A.
4. Connect the other end of the cable to a convenient end of the Y-cable attached to Host B.
5. Attach the compatible end of the 5M adapter cable (BN38C-05) to the available end of the HD68-pin Y-cable attached to Host B.
6. Connect the other (VHDCI-compatible) end of the adapter cable to the available end of a tri-link connector on a subsystem controller.
7. Connect terminator H8863-AA to the available end of a tri-link connector on a subsystem controller.
8. Connect terminator H879-AA to the available end of the Y-cable attached to Host A.

Figure 2-5 End-Bus RAID Subsystem and HD68-Pin Host Adapter Interconnect



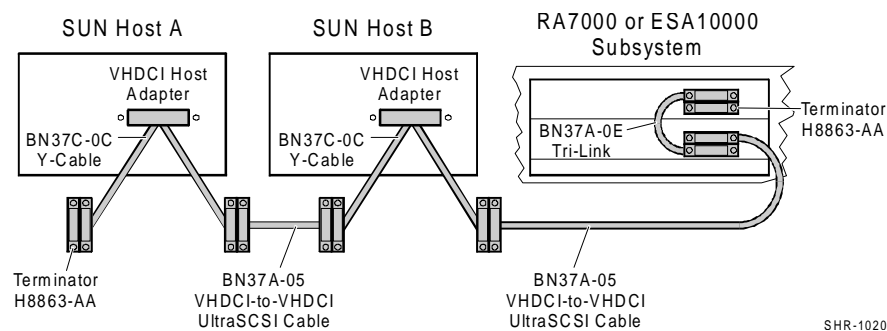
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2.7 End-Bus RAID Subsystem and VHDCI Host Adapter UltraSCSI Interconnect

To connect two Sun hosts equipped with VHDCI host adapters to a RAID subsystem located on the end of the UltraSCSI bus, reference Figure 2-6 and follow these steps:

1. Attach a Y-cable (BN37C-0C) to the VHDCI host adapter on Host A.
2. Attach a Y-cable (BN37C-0C) to the VHDCI host adapter on Host B.
3. Attach one end of UltraSCSI cable (BN37A-05) to one end of the Y-cable attached to Host A.
4. Connect the other end of the UltraSCSI cable to an end of the Y-cable attached to Host B.
5. Attach one end of an UltraSCSI cable (BN37A-05) to the available connector of the Y-cable attached to Host B.
6. Connect the other end of the UltraSCSI cable to the available end of a tri-link connector on a subsystem controller.
7. Connect a terminator (H8863-AA) to the available end of a tri-link connector on the subsystem controller.
8. Connect a terminator (H8863-AA) to the available end of the Y-cable on Host A.

Figure 2-6 End-Bus RAID Subsystem and VHDCI Host Adapter UltraSCSI Interconnect



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3

Software Setup Requirements for MultiHost High Availability

This chapter identifies the software setups required to enable Multihost High Availability. It directs you to the procedures to install the RAID Manager software, create the RAID subsystem storage configuration, and to install and configure VERITAS FirstWatch high availability software. It also describes how to install a “FirstWatch agent” to manage the failover of the RAID Manager (SWCC) software module.

The software setups required to enable high availability between your RAID subsystem and host servers are as follows:

- Install the RAID Manager software
- Create the RAID storage configuration
- Install and configure VERITAS FirstWatch software
- Install a FirstWatch transition module for RAID Manager (SWCC) failover

3.1 Installing the RAID Manager Software

The RAID Manager software must be configured identically on both host servers (e.g., both servers must have the same RAID Manager passwords, subsystems, notification lists and port numbers).

Reference the *Getting Started – HSZ70 Solutions Software V7.0b for Solaris 2.x*, Chapter 4, for procedures to install the RAID Manager Software on both host servers.

NOTE

Any future changes made to the RAID Manager configuration, *must* be made on both hosts.

3.2 Creating the RAID Storage Configuration

Reference the *Getting Started – HSZ70 Solutions Software V7.0b for Solaris 2.x*, Chapters 6 or 7 and Appendix B, to create the RAID storage configuration.

3.3 Installing and Configuring VERITAS FirstWatch Software

Reference the *VERITAS FirstWatch Installation and Configuration Guide for Solaris* (Release 2.2.4) to install and configure VERITAS FirstWatch high availability software on each of your Sun host servers.

3.4 Installing a FirstWatch Transition Module for RAID Manager (SWCC) Failover

In order for the RAID Manager to failover in the case of a server shutdown, you must install a FirstWatch transition module. To do so, first determine which server will be the primary for the RAID Manager. Under normal operating conditions, the RAID Manager will run on the primary host only. When the primary host is unavailable as in a failover, FirstWatch will start up the RAID Manager on the takeover host. To install the transition module, you must perform the following tasks on both servers:

- Mount the CD-ROM
- Run the `ha_config` script

3.4.1 Mounting the CD-ROM

1. Check whether the volume management daemon (`vold`) is currently running. Type:

```
# ps -ea | grep vold
```
2. Follow the steps below for “`vold` currently running” or “`vold` not currently running”, as applicable:

If `vold` is currently running, then:

- a) Insert the CD-ROM into the CD-ROM drive.
- b) Use the `mount` command to check that the volume manager has automatically mounted the CD-ROM, by typing:

```
# mount
```

NOTE

The system may take a few seconds to mount the CD-ROM. If the `mount` command does not indicate that the CD-ROM has been mounted, wait a short interval and then repeat the command.

- c) Change to the high availability directory, type:

```
# cd /cdrom/hsz70_v70b_sun/high_avail
```

With the CD-ROM mounted, proceed to Section 3.4.2, “Running the *ha_config* Script”.

If *vold* is not currently running, then:

- a) Insert the CD-ROM into the CD-ROM drive.

- b) Mount the CD-ROM. For example, type:

```
# mount -F hsfs -r /dev/dsk/c0t6d0s2 /cdrom
```

- c) Change to the high availability directory, type:

```
# cd /cdrom/high_avail
```

With the CD-ROM mounted, run the *ha_config* script as follows:

3.4.2 Running the *ha_config* Script:

The *ha_config* script verifies that the FirstWatch and the RAID Manager software are installed, and it installs the transition module in the appropriate directory for either a primary or takeover host.

NOTE

The *ha_config* script *must* be installed on both host servers. It must be installed as “primary” on one, and as “takeover” on the other.

If the CD-ROM is mounted on the *primary host*, type the following:

```
# ./ha_config primary
```

If the CD-ROM is mounted on the *takeover host*, type the following:

```
# ./ha_config takeover
```

The SWCC Raid Manager is now ready to failover in the event of a server shutdown.

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