

Tru64 UNIX New Hardware Delivery

Release Notes and Installation Instructions

November 2003

Product Version: NHD-7 for Tru64 UNIX Version 5.1B and Version 5.1A

The New Hardware Delivery Release Notes and Installation Instructions for NHD-7 describes the contents of this release and tells you how to install the NHD-7 kit onto your Tru64 UNIX Version 5.1B or Version 5.1A system.

© 2003 Hewlett-Packard Development Company, L.P.

UNIX® is a trademark of The Open Group. X/Open® is a registered trademark of X/Open Company Ltd. in the U.K. and other countries. PostScript® is a trademark of Adobe Systems Incorporated.

Proprietary computer software. Valid license from HP and/or its subsidiaries required for possession, use, or copying. Consistent with FAR 12.211 and 12.212, Commercial Computer Software, Computer Software Documentation, and Technical Data for Commercial Items are licensed to the U.S. Government under vendor's standard commercial license.

Neither HP nor any of its subsidiaries shall be liable for technical or editorial errors or omissions contained herein. The information is provided "as is" without warranty of any kind and is subject to change without notice. The warranties for HP products are set forth in the express limited warranty statements accompanying such products. Nothing herein should be construed as constituting an additional warranty.

Contents

About This Manual

1 Introduction

1.1	NHD Overview	1-1
1.2	Getting an NHD-7 Kit	1-1
1.3	New Hardware Delivery Resources	1-2

2 Supported Hardware

2.1	AlphaServer DS15/TS15 Functional Support	2-1
2.2	AlphaServer ES47/ES80/GS1280 Functional Support	2-1
2.2.1	Hardware Interrupt Redistribution	2-2
2.2.2	Enhanced Environmental Monitoring	2-2
2.3	AlphaServer DS20L Systems	2-3
2.4	Broadcom 5703 PCI/PCI-X GbE Cluster Interconnect	2-3
2.5	Smart Array 5300A RAID Controllers	2-3

3 NHD-7 Release Notes

3.1	Updating Firmware May Cause a System to Hang	3-1
3.2	Shell Access During Full Installation	3-1
3.3	Full Installation Only on DS15 and DS20L	3-1
3.4	DS20L or DS25 Startup with No IDE Disks	3-1
3.5	Setting Up SA5300A Controllers	3-2
3.5.1	Performing SRM Console Actions	3-2
3.5.2	Rebuilding the Kernel After Changing HEAP_EXPAND	3-3
3.6	Installation Messages	3-4
3.6.1	Invalid Subclass Error	3-4
3.6.2	DS20L or DS25 Boot Messages	3-4
3.6.3	DS20L or DS25 daemon.log Error Messages	3-4
3.6.4	Tag File Creation Message	3-4
3.6.5	Older File Installation Error Messages	3-5
3.6.6	RIS Installation Error Messages	3-5
3.6.7	Version 5.1A Release Notes	3-5
3.6.7.1	Full Installation Only on New DS25	3-5
3.6.7.2	Rolling Upgrade Status Messages	3-5

4 NHD for Version 5.1B Installation Instructions

4.1	Preparing for an NHD-7 Installation	4-1
4.1.1	Preliminary Steps	4-1
4.1.2	Creating an NHD-7 Kit CD Image	4-2
4.1.3	Preparing for a RIS installation	4-3
4.1.3.1	Setting Up the RIS Area	4-3
4.1.3.2	Registering the RIS Client	4-4
4.2	Installing the NHD-7 Kit	4-4
4.2.1	Installing on a Single System Running Version 5.1B	4-5

4.2.2	Installing on a Single System During a Full Installation of Version 5.1B	4-7
4.2.2.1	Installing from a CD-ROM or CD Image	4-8
4.2.2.2	Installing from RIS	4-12
4.2.3	Installing on a Cluster Running Version 5.1B	4-13
4.2.3.1	Preparation Stage	4-14
4.2.3.2	Setup Stage	4-14
4.2.3.3	Preinstall Stage	4-16
4.2.3.4	Install Stage	4-16
4.2.3.5	Postinstall Stage	4-19
4.2.3.6	Roll Stage	4-19
4.2.3.7	Switch Stage	4-21
4.2.3.8	Clean Stage	4-22
4.2.4	Installing on a Cluster During a Full Installation of Version 5.1B	4-23
4.2.5	Rebuilding the Kernel After Adding Supported Hardware	4-25

5 NHD for Version 5.1A Installation Instructions

5.1	Preparing for the Installation	5-1
5.1.1	Preliminary Steps	5-1
5.1.2	Creating an NHD-7 Kit CD Image	5-2
5.1.3	Preparing for a RIS installation	5-3
5.1.3.1	Setting Up the RIS Area	5-3
5.1.3.2	Registering the RIS Client	5-4
5.2	Installing the NHD-7 Kit	5-4
5.2.1	Installing on a Single System Running Version 5.1A	5-5
5.2.2	Installing on a Single System During a Full Installation of Version 5.1A	5-7
5.2.2.1	Installing from a CD-ROM or CD Image	5-8
5.2.2.2	Installing from RIS	5-12
5.2.3	Installing on a Cluster Running Version 5.1A	5-13
5.2.3.1	Preparation Stage	5-14
5.2.3.2	Setup Stage	5-14
5.2.3.3	Preinstall Stage	5-16
5.2.3.4	Install Stage	5-16
5.2.3.5	Postinstall Stage	5-19
5.2.3.6	Roll Stage	5-19
5.2.3.7	Switch Stage	5-21
5.2.3.8	Clean Stage	5-22
5.2.4	Installing on a Cluster During a Full Installation of Version 5.1A	5-23
5.2.5	Rebuilding the Kernel After Adding Supported Hardware	5-25

Index

Figures

4-1	NHD Rolling Upgrade	4-14
5-1	NHD Rolling Upgrade	5-14

Tables

2-1	Environmental Monitoring Reference Pages	2-3
-----	--	-----

About This Manual

New Hardware Delivery (NHD) provides installable kernel support for new hardware without requiring a new release of the operating system. You can order NHD kits on CD-ROM or download them from the World Wide Web.

This manual describes the contents of an NHD kit and how to acquire the current NHD distribution. It also tells you how to create a CD image of the NHD distribution from a downloaded NHD kit and how to install NHD onto your system.

This manual and *Release Notes and Installation Instructions* for previous NHD releases are available on the World Wide Web at the following URL:

<http://h30097.www3.hp.com/docs/nhd/>

Technical updates for NHD releases are available at the following URL:

http://h30097.www3.hp.com/docs/pub_page/update_list.html

Audience

This manual is for people who install NHD kits — typically, experienced UNIX system administrators.

New and Changed Features

The following major features have been added or changed since the NHD-6 release:

- The integration of the one of the following Tru64 UNIX patch kits into the NHD-7 kit.
 - Patch Kit 3 for Version 5.1B
 - Patch Kit 6 for Version 5.1A

The patch kit for your operating system is installed by default when you install the NHD kit from CD-ROM or when using the Remote Installation Services (RIS). When using the `./nhd_install` script with kits downloaded from the Web, you are prompted to install the patch kit.

- Functional support for the new AlphaServer DS15 and TS15 platforms (*Section 2.1*)

Organization

This manual is organized as follows:

<i>Chapter 1</i>	Gives an overview of the New Hardware Delivery program and describes available NHD resources, such as where to obtain an NHD kit and find documentation you can use.
<i>Chapter 2</i>	Lists the supported hardware.
<i>Chapter 3</i>	Provides notes and restrictions pertaining to the NHD-7 kit and its supported hardware.
<i>Chapter 4</i>	Tells you how to install the NHD-7 kit on a Version 5.1B system.
<i>Chapter 5</i>	Tells you how to install the NHD-7 kit on a Version 5.1A system.

Related Documentation

You may find the following HP Tru64 UNIX documents helpful when you install NHD-7:

- The documentation for the hardware supported in NHD-7.
- The *Installation Guide* describes the procedures to perform an Update Installation or a Full Installation of the operating system on all supported processors and single-board computers. It explains how to prepare your system for installation, boot the processor, and perform the installation procedure.
- The *Installation Guide — Advanced Topics* manual describes such advanced installation procedures as Installation Cloning, Configuration Cloning, and how to customize the installation process with user supplied files.
- The TruCluster Server *Cluster Installation* manual describes cluster preparation, installation, and creation and how to perform a Rolling Upgrade on the Tru64 UNIX operating system.
- The *Sharing Software on a Local Area Network* manual describes Remote Installation Services (RIS) for installing software over a LAN and Dataless Management Services (DMS) for sharing a /usr file system on a network server.
- The *System Administration* manual describes how to configure, use, and maintain the operating system. It includes information on general day-to-day activities and tasks, changing your system configuration, and locating and eliminating sources of trouble. This manual is intended for the system administrators responsible for managing the operating system.
- The *Hardware Management* manual describes how to administer the hardware components and storage devices controlled by the operating system. This manual is intended for experienced system administrators who are familiar with maintaining the system for high availability.
- The *Managing Online Addition and Removal* manual provides guidelines and techniques for Online Addition and Replacement (OLAR) of system components on OLAR-capable systems. It also discusses component indictment, automatic deallocation, and related service tools.
- *Reference Pages Sections 8 and 1m* describe commands for system operation and maintenance and are intended for system administrators. In printed format, this is divided into two volumes.

The Tru64 UNIX documentation is available on the World Wide Web at the following URL:

<http://h30097.www3.hp.com/docs/>

Reader's Comments

HP welcomes any comments and suggestions you have on this and other Tru64 UNIX manuals.

You can send your comments in the following ways:

- Fax: 603-884-0120 Attn: UBPG Publications, ZKO3-3/Y32
- Internet electronic mail: readers_comment@zk3.dec.com

A Reader's Comment form is located on your system in the following location:

`/usr/doc/readers_comment.txt`

Please include the following information along with your comments:

- The full title of the manual and the order number, if the manual has one. (When provided, the order number appears on the title page of printed and PDF versions of a manual.)
- The section numbers and page numbers of the information on which you are commenting.
- The version of Tru64 UNIX that you are using.
- If known, the type of processor that is running the Tru64 UNIX software.

The Tru64 UNIX Publications group cannot respond to system problems or technical support inquiries. Please address technical questions to your local system vendor or to the appropriate HP technical support office. Information provided with the software media explains how to send problem reports to HP.

Conventions

The following conventions are used in this manual:

%	
\$	A percent sign represents the C shell system prompt. A dollar sign represents the system prompt for the Bourne, Korn, and POSIX shells.
#	A number sign represents the superuser prompt.
% cat	Boldface type in interactive examples indicates typed user input.
<i>file</i>	Italic (slanted) type indicates variable values, placeholders, and function argument names.
[]	
{ }	In syntax definitions, brackets indicate items that are optional and braces indicate items that are required. Vertical bars separating items inside brackets or braces indicate that you choose one item from among those listed.
...	In syntax definitions, a horizontal ellipsis indicates that the preceding item can be repeated one or more times.
cat(1)	A cross-reference to a reference page includes the appropriate section number in parentheses. For example, cat(1) indicates that you can find information on the cat command in Section 1 of the reference pages.
Return	In an example, a key name enclosed in a box indicates that you press that key.
Ctrl/x	This symbol indicates that you hold down the first named key while pressing the key or mouse button that follows the slash. In examples, this key combination is enclosed in a box (for example, Ctrl/C).

Introduction

This chapter provides an overview of the New Hardware Delivery (NHD) process and describes how to obtain an NHD-7 kit.

1.1 NHD Overview

The New Hardware Delivery program provides support for new hardware on AlphaServer platforms running the Tru64 UNIX operating system.

The NHD kits are cumulative, which means that each kit provides all of the support contained in earlier kits, in addition to any new support. For example, the NHD-7 kit contains all of the support included in the NHD-6 kit. For information about what is new in the NHD-7 kit, see *New and Changed Features*.

All system hardware requires supporting modules in the operating system kernel. Without this kernel support, the operating system cannot interact with the hardware and may fail to function altogether. An NHD kit includes kernel modules that let your system support new or upgraded hardware.

NHD lets you install new hardware support without reinstalling the base operating system. However, you must reboot your system to build a kernel that includes the modules that support your new hardware. The bootlink process builds a generic kernel in memory, using generic kernel modules along with those included in your NHD kit. This bootlinked kernel is not written to disk, but allows the boot process to include the hardware support modules into your running kernel.

Note

If you need to boot `genvmunix` after you have installed hardware support, your system will not recognize the hardware you installed with NHD. To access all of the kernel modules supplied by `genvmunix` and NHD, use the following command to boot `/GENERIC`:

```
>>> boot -fi GENERIC
```

1.2 Getting an NHD-7 Kit

You can get an NHD-7 kit from two sources:

- Order it on CD-ROM from your Tru64 UNIX sales or service representative.
- Download it from the World Wide Web.

To order the NHD-7 kit on CD-ROM, contact your Tru64 UNIX sales or service representative at 1-800-888-0220 and request part number QA-MT4AX-H8.

To download the NHD-7 kit from the World Wide Web, go to the following Web site:

<http://www.itrc.hp.com/service/patch/mainPage.do>

Enter `NHD7` in the box under: "Retrieve a single patch by entering the patch name (e.g. `PHCO_12345` or `12345`)," Click on the `>>` button, and follow the directions for downloading the NHD7 kit.

1.3 New Hardware Delivery Resources

The following list describes resources you can use when working with NHD kits:

- To view or print current or previous versions of the NHD *Release Notes and Installation Instructions* go to the following Web site:

<http://h30097.www3.hp.com/docs/nhd/>

- When needed, we provide Technical Updates for NHD kits to describe any issues that were discovered after the release of a kit. To see if there is a technical update for a specific NHD kit, go to the following Web site:

http://h30097.www3.hp.com/docs/pub_page/update_list.html

- When you install the NHD kit, you also install the latest Tru64 UNIX patch kit. You can view the *Patch Summary and Release Notes* for the patch kit in two ways:

- On the NHD-7 CD-ROM

Using your browser (for an HTML version) or Adobe Acrobat Reader (for a PDF version) select one of the following files:

```
mnt_pt/540/Tru64UNIX_Patches/Tru64_UNIX_V5.1B/ReleaseNotes.htm
mnt_pt/540/Tru64UNIX_Patches/Tru64_UNIX_V5.1B/ReleaseNotes.pdf
mnt_pt/520/Tru64UNIX_Patches/Tru64_UNIX_V5.1A/ReleaseNotes.htm
mnt_pt/520/Tru64UNIX_Patches/Tru64_UNIX_V5.1A/ReleaseNotes.pdf
```

To view the *Patch Kit Installation Instructions*, which are included with all patch kits, select one of the following files:

```
mnt_pt/540/Tru64UNIX_Patches/PatchInstallGuide.htm
mnt_pt/540/Tru64UNIX_Patches/PatchInstallGuide.pdf
mnt_pt/520/Tru64UNIX_Patches/PatchInstallGuide.htm
mnt_pt/520/Tru64UNIX_Patches/PatchInstallGuide.pdf
```

- On the Web

To view or print the current or previous versions of the *Patch Summary and Release Notes* or the *Patch Kit Installation Instructions* from the Web, go to the following Web site:

<http://h30097.www3.hp.com/docs/patch/>

- The Tru64 UNIX documentation is available from the following Web site:

<http://h30097.www3.hp.com/docs/>

- To visit our main support page:

<http://h71025.www7.hp.com/support/home/index.asp>

- To visit the Tru64 UNIX homepage:

<http://h30097.www3.hp.com/>

Supported Hardware

The NHD-7 release includes support for the following hardware:

- AlphaServer DS15/TS15 functional support (Section 2.1)
- AlphaServer ES47/ES80/GS1280 functional support (Section 2.2)
- AlphaServer DS20L systems (Section 2.3)
- Broadcom 5703 communication processors as cluster interconnect devices (Section 2.4)
- Smart Array 5300A series RAID controllers (Section 2.5)

2.1 AlphaServer DS15/TS15 Functional Support

The DS15 and TS15 are low-end platforms designed as a replacements for the DS10 platform. They contain a single Alpha EV68 processor and the Titan chipset.

Operating system support for these platforms is derived from the same code base as similar Titan-based platforms, such as the DS25 and the ES45. This NHD kit provides the Tru64 UNIX Version 5.1B and Version 5.1A support for this platform.

The DS15 and TS15 platforms have the following features:

- Up to 15 environmental sensors, depending on the system configuration:
 - One thermal sensor
 - Ten voltage sensors
 - Up to four fan sensors (CPU, system, PCI, and SCSI front-access disk cage, although the system configuration with the internal-access disk drive cage does not have a fan and therefore has no sensor for it)
- The ability to shut down the platform, initiated by the Remote Management Console (RMC), upon a fatal fan threshold or fatal temperature threshold environmental events. This ability can be enabled or disabled through an RMC command or a console callback provided to the operating system.

Additionally, the TS15 includes a “watchdog timer,” which when enabled resets the system and brings it back automatically if it malfunctions and does not respond within a certain time after a catastrophic event, such as an earthquake.

The following information is available on the Web to help you configure your DS15:

- **Configuring the DS15 in a cluster using shared SCSI**
- **Configuring the environmental subsystem**

2.2 AlphaServer ES47/ES80/GS1280 Functional Support

The AlphaServer ES47, ES80, and GS1280 systems are high-performance server platforms designed for enterprise-level applications.

- AlphaServer ES47 systems are workgroup servers (or workstations) based on dual 1.0 GHz EV7 processor modules in a two-processor (2P) drawer with a maximum of two modules.
- AlphaServer ES80 systems are departmental servers based on dual 1.0 GHz EV7 processor modules in a 2P drawer with a maximum of four modules.

- AlphaServer GS1280 systems are enterprise servers based on dual 1.15 GHz EV7 processor modules in an 8P drawer; different models have different maximum capacities.

Support for AlphaServer ES47/ES80/GS1280 systems was included in the NHD-6 kit, and has since been added to Patch Kit 3 for Version 5.1B. If you install this patch kit independently of the NHD-7 kit, the patch kit will provide the required support for these systems. This support includes the following:

- Hardware interrupt redistribution (Section 2.2.1)
- Enhanced environmental monitoring (Section 2.2.2)

2.2.1 Hardware Interrupt Redistribution

Hardware interrupt redistribution is a servicability function that enables the system's ability to indict a CPU either before or during its failure. Compaq Analyze, a Web-Based Enterprise Services (WEBES) component, triggers a message to Event Manager when pre-defined thresholds are exceeded, and user-defined Event Manager policy determines whether the Automatic Deallocation facility will take the failing CPU off line. NHD-7 provides support for the ability to indict a failing or potentially failing CPU.

2.2.2 Enhanced Environmental Monitoring

NHD-7 enhances environmental monitoring support for AlphaServer ES47/ES80/GS1280 systems, including temperature, fan, and power supply status. Environmental monitoring on AlphaServer ES47/ES80/GS1280 systems is more comprehensive than on earlier Alpha architectures.

Changes to the environmental monitoring daemon (`envmond`) and its configuration utility (`envconfig`) allow `envmond` to take action based on the values of a single sensor in a multiple-sensor configuration.

If an environmental event occurs, HP server hardware powers down to prevent system damage; this is an abrupt power down without time for software cleanup. The goal of `envmond` is to perform a graceful operating system shutdown before such a self-preservation hardware power down occurs, allowing application data to be saved first. To ensure that no data is lost, `envmond` errs on the side of caution and may shut down the operating system at times when the hardware could recover.

In existing versions of the operating system, the `envmon.mod` kernel module provides a system view that assumes one temperature, one power supply, and one fan sensor. On systems with multiple sensors, only the single worst-case sensor is reported. Newer HP hardware platforms consist of multiple hardware components with multiple temperature, power supply, and fan sensors. NHD-7 provides support for action based on the status of any individual sensor rather than on the single worst-case sensor model. The `envmon.mod` kernel module is no longer supported on the AlphaServer ES47/ES80/GS1280 hardware platforms.

NHD-7 support for these enhancements includes updates to the `envmond(8)` and `envconfig(8)` reference pages.

Table 2-1 lists the location of environmental monitoring reference page files in the NHD-7 kit distribution.

Table 2-1: Environmental Monitoring Reference Pages

File Location	Description
<code>./DOC/man8/envmond.*</code>	envmond(8) reference page in source, HTML, PDF, PostScript®, and text format
<code>./DOC/man8/envconfig.*</code>	envconfig(8) reference page in source, HTML, PDF, PostScript, and text format

2.3 AlphaServer DS20L Systems

The AlphaServer DS20L system is a dual-processor system in a high-density form factor. It supports up to two Alpha 21264-series processors at speeds up to 833 MHz.

This system includes a maximum 166 MHz system bus with Double Data Rate (DDR) transfers, for a maximum bandwidth of 2.67 GB per second. It also includes a 256-bit memory bus, two 64-bit 33 MHz PCI buses, and an external L2 cache with a 128-bit data path supporting 4 MB cache per processor in DDR SRAMs.

The DS20L system can support up to 2 GB of memory in eight 256 MB dual inline memory modules (DIMMs) and provides two 64-bit 33 MHz PCI slots for I/O expansion.

NHD-7 supports AlphaServer DS20L systems for Version 5.1B and Version 5.1A.

The following list provides the orderable part numbers for DS20L systems:

- DA-81AAA-EA (512 MB, Symbios riser card)
- DA-81AAA-FA (1 GB, Symbios riser card)
- DA-81AAA-GA (2 GB, Symbios riser card)
- DA-81BAA-EA (512 MB, Adaptec riser card)
- DA-81BAA-FA (1 GB, Adaptec riser card)
- DA-81BAA-GA (2 GB, Adaptec riser card)

2.4 Broadcom 5703 PCI/PCI-X GbE Cluster Interconnect

The Broadcom 5703 gigabit Ethernet (GbE) communication processor is a 10/100/1000 base-T full/half duplex device, implemented as both a LAN-on-motherboard (LOM) on DS25 systems and as a network interface card (NIC). This device provides peripheral component interconnect (PCI) and PCI-extended (PCI-X) Gigabit Ethernet services to supported AlphaServer systems.

NHD-7 supports the Broadcom 5703 communication processor as a cluster interconnect device for TruCluster configurations running Version 5.1B and Version 5.1A.

The Broadcom 5703 LOM is integral to DS25 systems.

The following are the orderable part numbers for Broadcom 5703 NICs:

- 3X-DEGXA-SA supports multi-mode fiber (MMF) cable, using a duplex-SC connector
- 3X-DEGXA-TA supports unshielded twisted-pair (UTP) copper cable, using an RJ45 connector

2.5 Smart Array 5300A RAID Controllers

The Smart Array (SA) 5300A series RAID controllers are two-channel (128 MB memory) and four-channel (256 MB memory) Ultra3 SCSI hard drive array

controllers with battery-backed cache. The SA5300A series controllers support Ultra3 LVD SCSI technology for improved data transfer rates (160 MB/second per channel) and are backward compatible with devices using older SCSI technologies.

NHD-7 supports SA5300A series RAID controllers for Version 5.1B and Version 5.1A.

The following are the orderable part numbers for SA5300A series RAID controllers:

- 3X-KZPDC-BE (two-channel SA5302A controller with 128 MB cache)
- 3X-KZPDC-DF (four-channel SA5304A controller with 256 MB cache)

NHD-7 Release Notes

This chapter describes known issues and restrictions pertaining to the NHD-7 kit. The following topics are discussed:

- Updating firmware may cause system to hang (Section 3.1)
- Accessing the shell during Full Installation (Section 3.2)
- Performing a Full Installation only on DS20L (Section 3.3)
- Starting the DS20L or DS25 platforms with no IDE disks (Section 3.4)
- Setting up Smart Array 5300A controllers (Section 3.5)
- Installation messages (Section 3.6)

3.1 Updating Firmware May Cause a System to Hang

After you load new console firmware for the AlphaServer DS25 and ES45, the presence of a 3X-DEGXA-SA/TA network interface card (NIC) on the system may cause the system to hang when you perform a RIS (Remote Installation Services) installation. This can occur even if the 3X-DEGXA NIC is being used as a cluster interconnect and another NIC is connected to the network. This condition should not occur if the NHD kit is installed on the RIS server.

To work around this problem, take one of the following actions:

- Add the NHD kit to the RIS area. This is the recommended workaround.
- Physically disconnect the cable from the 3X-DEGXA NIC before starting the installation.

3.2 Shell Access During Full Installation

If you are installing NHD-7 from the New Hardware Delivery CD-ROM during a Full Installation and you try to launch a shell window, it will fail. You will see the following message in the console window:

```
Error acquiring pty slave as controlling terminal: Not a typewriter.
```

Perform the following steps to access the shell:

1. Exit the Full Installation process to access the shell from the console device.
2. At the shell prompt, perform the intended actions.
3. Enter **restart** and press Return to restart the Full Installation process.

3.3 Full Installation Only on DS15 and DS20L

You must install the NHD-7 kit during a Full Installation of the operating system on a DS15 and DS20L system. The kernel modules to support the DS20L system are included in the NHD-7 kit.

3.4 DS20L or DS25 Startup with No IDE Disks

You may encounter the following behavior when starting up a DS20L or DS25 system configured with SCSI disks but no IDE disks:

- If you power on a DS20L or DS25 system and it has no IDE disks installed, the IDE controller driver may detect and report a stray interrupt. Subsequent boots without cycling power do not exhibit this behavior. This is a known issue and can be ignored.
- If you boot a DS20L or DS25 system from a SCSI disk and it has no IDE disks installed, the system may report IDE probe errors during the boot process. Boot time may be increased as the system issues bus resets. This is a known issue.

3.5 Setting Up SA5300A Controllers

The following issues related to installing NHD-7 onto a system that includes SA5300A series RAID controllers:

- If you want to use a disk managed by an SA5300A series RAID controller as a boot device, you must install the NHD-7 kit during a Full Installation of the operating system. If you install NHD-7 onto an existing system with the `nhd_install` script, disks managed by SA5300A series RAID controllers cannot be used as boot devices.
- If your system includes SA5300A series RAID controllers, you must perform certain actions from the SRM console before you install NHD-7 during a Full Installation of the operating system. If you are installing NHD-7 onto a system already running Version 5.1B or Version 5.1A of the operating system, you must perform the same actions from the SRM console and may need to perform additional steps to rebuild the kernel before you run the `nhd_install` script.
 - If you are installing NHD-7 during a Full Installation, follow the instructions in Section 3.5.1 before you install the NHD-7 kit. This applies whether you are installing to an SA5300A-backed disk or to a non-SA5300A disk.
 - If you are installing NHD-7 onto a system already running Version 5.1B or Version 5.1A of the operating system and you have changed the value of the `heap_expand` console variable, follow the instructions in both Section 3.5.1 and Section 3.5.2 before you install the NHD-7 kit.

3.5.1 Performing SRM Console Actions

Before you install NHD-7 onto a system that includes SA5300A series RAID controllers, follow these steps:

1. At the console prompt, use the following command to determine the console device name of the SA5300A controller:

```
>>> show config | more
```

Look for devices with a `py` prefix; you see output similar to the following:

```
CPQ SmartArray 5300  pya.0.0.10.0
```

In this example, the console device name of SA5300A controller is `pya0`. SA5300A controllers are assigned console device name `pya0`, `pyb0`, `pyc0`, and so on, in the order they are scanned by the system when it powers up.

2. Determine the value of the `heap_expand` console variable:

```
>>> show heap_expand
heap_expand = nMB
```

- If the value is 2MB, go to the next step.
- If the value is anything else, set the value to 2MB:

```
>>> set heap_expand 2MB
```

Caution

If your system is already running Version 5.1B or Version 5.1A of the operating system and you change the value of the `heap_expand` console variable, you may not be able to reboot your system unless you follow the kernel rebuilding instructions in Section 3.5.2 first.

3. Initialize the system:

```
>>> init
```

4. Set the value of the `bootbios` console variable to the SA5300A console device name. For example:

```
>>> set bootbios pya0
```

5. Initialize the system again:

```
>>> init
```

6. If you are installing NHD-7 to an SA5300A-backed disk, you must create at least one logical volume first. See the SA5300A series RAID controller *Installation and Configuration Guide* for the procedure to create logical volumes with the Option ROM Configuration for Arrays (ORCA) offline configuration utility.

The target SA5300A BIOS now runs whenever the console is initialized. The console `show dev` command will show SA5300A-backed logical disks such as `DYA0`, `DYA1`, and so on when `bootbios` is set to `pya0`.

If you have more than one SA5300A series RAID controller, you will only see the devices backed by the controller specified by the `bootbios` setting.

- If you are installing NHD-7 during a Full Installation, you are ready to follow the instructions in Chapter 4 if you are installing on a Version 5.1B system and Chapter 5 if you are installing on a Version 5.1A system.
- If you are installing NHD-7 onto a system that includes SA5300A series RAID controllers and is already running Version 5.1B or Version 5.1A of the operating system and you have changed the value of the `heap_expand` console variable, follow the steps in Section 3.5.2 before you install NHD-7.

3.5.2 Rebuilding the Kernel After Changing HEAP_EXPAND

If you are installing NHD-7 onto a system that includes SA5300A series RAID controllers and is already running Version 5.1B or Version 5.1A of the operating system, make sure you have performed all of the SRM console actions in Section 3.5.1. If you have changed the value of the `heap_expand` console variable, follow these steps:

1. From the console prompt, boot the generic kernel:

```
>>> boot -fi /genvmunix
```

If you do not have a generic kernel on your boot disk, boot the generic kernel from the operating system software distribution CD-ROM.

2. At the root shell prompt, use the `sizer` command to create a temporary configuration file in the `/tmp` directory. For example:

```
# sizer -n filename
```

Make sure that `filename` or `filename.dev` does not already exist in the `/tmp` directory.

3. Search the temporary configuration file for the embedded value of the `LOADADDR` parameter. For example:

- ```
grep LOADADDR /tmp/myfile
makeoptions LOADADDR="fffffc0000230000"
```
4. Edit the current system configuration file `./SYSNAME` and change the existing value of the `LOADADDR` parameter to the value in the temporary configuration file. In this example, the value from the previous step is `fffffc0000230000`.
  5. Use the `doconfig` command to build a new custom kernel. For example:
 

```
doconfig -c /sys/conf/SYSNAME
```
  6. Copy the newly built kernel to `/vmunix`. For example:
 

```
cp /sys/SYSNAME/vmunix /vmunix
```
  7. Reboot your system.

## 3.6 Installation Messages

The following sections describe messages related to installing the NHD-7 kit and recommend what action to take.

### 3.6.1 Invalid Subclass Error

You might see this message during a RIS installation of Version 5.1B. It is a nonfatal error message that you can ignore.

```
Error: Line 2257: Invalid Tape Subclass
```

New classes have been added to the `ddr` file that are not supported with the version of the command of `ddr_config` that shipped with Version 5.1B of the operating system. The error is nonfatal because the correct `ddr` data base is installed on the target installation disk and the `ddr.db` will be rebuilt when the system is rebooted.

### 3.6.2 DS20L or DS25 Boot Messages

During a DS20L or DS25 system boot, you may see the following PCI table error message:

```
PCI device at bus 0, slot 3, function 0 could not be configured:
Vendor ID 0x1000, Device ID 0x21, Base class 0x1, Sub class 0x0
Sub-VID 0x14d9
Sub-DID 0x8002
has no matching entry in the PCI option table
```

You also may see the following unrelated driver error message:

```
<FDI: FATAL ERROR #174 sra:000000ff dor:000000ff msr:000000ff>
fd internal driver error: FDI PROBE FAIL (A,11).
```

Both of these messages reflect known errors and can be ignored.

### 3.6.3 DS20L or DS25 daemon.log Error Messages

After booting a DS20L or DS25 system, you may see error messages similar to the following in the `daemon.log` files:

```
Sep 24 11:28:37 hpsql6 [616]: Initializing the threshold structure
Sep 24 11:28:38 hpsql6 [616]: **ERROR svrsys_fru_parse.c line 1264: \
FRU Table TLV tag of 0 is not ISOLATIN1
```

These messages are generated when there is no field replaceable unit (FRU) table available on the system and can be ignored.

### 3.6.4 Tag File Creation Message

During the Setup Stage of a Rolling Upgrade, you may see a message similar to the following during tag file creation:

```
clubase: Entry not found in /cluster/admin/tmp/stanza.stdin.530756
```

This reflects a known error and can be ignored.

### 3.6.5 Older File Installation Error Messages

If you install the current patch kit for Version 5.1B or Version 5.1A of the operating system before you install the NHD-7 kit, you may see multiple error messages similar to the following when you install the patch kit:

```
OSHHWBASE521 version ./path/file is older than the previous, restoring previous version
```

These messages indicate that the files in the NHD-7 kit have been superseded by the files in the patch kit and that the patch kit's version of the files will be used instead. You can ignore these messages.

### 3.6.6 RIS Installation Error Messages

If you are installing NHD-7 from a RIS server, you may see messages similar to the following before the system is configured:

```
The /usr/sbin/versw -setnew command failed. This error is not fatal,
and the operating system installation will continue. The following
message was received from /usr/sbin/versw -setnew:
```

```
Failure to set the new version identifier
```

The kernel that is running at this point includes NHD bits, but NHD support has not yet been loaded or configured on your system. This reflects a known issue and can be ignored.

### 3.6.7 Version 5.1A Release Notes

The release notes in the following apply only to NHD-7 on Version 5.1A of the operating system:

#### 3.6.7.1 Full Installation Only on New DS25

If you are installing Version 5.1A of the operating system onto a DS25 system for the first time, you must install the kit during a Full Installation of the operating system. The kernel modules to support the DS25 are included in the NHD-7 kit.

If you have a DS25 system already running Version 5.1A with NHD-6, you can use the `nhd_install` script to install NHD-7.

#### 3.6.7.2 Rolling Upgrade Status Messages

If you are installing NHD-7 during a Rolling Upgrade onto a cluster running Version 5.1A and you check the cluster upgrade status, you see output similar to the following example (in this case, after the Setup Stage is complete):

```
clu_upgrade -v
Retrieving cluster upgrade status.
 Upgrade Status

Stage Status Date

setup started: Thu Jun 20 08:59:48 EDT 2002
 lead member: 1
 patch kit source: /mnt
 completed: Thu Jun 20 09:05:29 EDT 2002

Member Status Tagged File Status

ID Hostname State Rolled Running with On Next Boot

1 member01.site.place.net UP No No No
10 member10.site.place.net UP No Yes Yes
20 member20.site.place.net UP No Yes Yes
```

This output incorrectly indicates patch kit source rather than NHD kit source. The source information (in this example, /mnt) is correct; the label is in error.

---

## NHD for Version 5.1B Installation Instructions

This chapter tells you how to prepare for installation, where to get the NHD-7 kit, and how to install it on your Version 5.1B system. It includes the following topics:

- Preparing to install NHD (Section 4.1)
- Installing the NHD kit (Section 4.2)

See Chapter 5 for instructions on installing NHD-7 on Version 5.1A systems.

### 4.1 Preparing for an NHD-7 Installation

This section describes preliminary steps to take when installing the NHD-7 kit. It also describes the following:

- How to create a CD image on disk (Section 4.1.2), which you must do if you downloaded your kit from the Web.
- How to prepare your system for installing from a Remote Installation Services (RIS) server (Section 4.1.3).

#### 4.1.1 Preliminary Steps

Follow these steps before you install NHD-7:

1. If your system already is running Version 5.1B of the operating system, perform a full backup of your system.
2. Get the NHD-7 kit as described in Section 1.2.
3. Create an NHD-7 kit CD image as described in Section 4.1.2.
4. If you are installing from a RIS server, perform the following tasks:
  - a. Set up the RIS area as described in Section 4.1.3.1.
  - b. Register your system as a RIS client as described in Section 4.1.3.2.

See the *Sharing Software on a Local Area Network* manual for more information about RIS.

5. If your system already is running a version of the operating system, shut down your system.
6. Upgrade your system to the latest version of firmware for your processor.
7. Determine the console name of your system disk and any devices you will use for software distributions, such as the NHD-7 kit, the Tru64 UNIX operating system distribution, and the Associated Products, Volume 2, distribution for TruCluster software. This could include the following:
  - Any CD-ROM drives where you are mounting CD-ROMs
  - Any spare disk used to create a CD image
  - Your network interface adapter if you are installing from a RIS server
8. At the console prompt, set the value of the `bootdef_dev` variable to null:

```
>>> set bootdef_dev ""
```
9. At the console prompt, set the value of the `auto_action` variable to `halt`:

```
>>> set auto_action halt
```

10. At the console prompt, set the value of the `boot_osflags` variable to a:

```
>>> set boot_osflags a
```

11. Power down your system.
12. Review your hardware documentation and install your new hardware.

---

#### Note

---

If you add supported hardware after NHD-7 is already installed on your system, follow the instructions in Section 4.2.5 to include support for the new hardware in your custom kernel on either the single system or the cluster member where you install the new hardware.

---

13. Power up your system.
14. Install NHD-7 according to the instructions in Section 4.2.

---

#### Caution

---

Before you install NHD-7 onto a system that includes SA5300A series RAID controllers, see the release notes in Section 3.5. Failure to follow these instructions can cause your NHD-7 installation to fail.

---

## 4.1.2 Creating an NHD-7 Kit CD Image

If you downloaded an NHD-7 kit from the Web, you must first create a CD image of the kit on disk. (See Section 1.2 for information about downloading a kit.)

The following steps assume that you have downloaded the NHD-7 kit to `/usr/tmp` and that you have a spare disk with at least 750 MB of free space to use for the CD image.

---

#### Note

---

This procedure creates a CD image of the NHD-7 kit distribution for installation purposes. It does not allow you to burn a CD-ROM from this image.

---

1. Log in as `root`.
2. Select a disk of at least 750 MB that is empty or can be overwritten. In this example, this disk will be referred to as `dskX`.
3. Use the `disklabel -e` command to make the `a` partition on `/dev/disk/dskXc` the same size as the `c` partition.
4. Create a new UFS file system on the spare disk. For example:

```
newfs /dev/rdisk/dsk2c
```

You will see output similar to this:

```
Warning: /dev/rdisk/dsk2c and overlapping partition(s) are marked in use.
If you continue with the operation you can
possibly destroy existing data.
CONTINUE? [y/n]
```

5. Enter **y** to continue. You will see output similar to this:

```
/dev/rdisk/dsk2c: 8380080 sectors in 3708 cylinders of 20 tracks, \
 113 sectors
4091.8MB in 232 cyl groups (16 c/g, 17.66MB/g, 4288 i/g)
```

```
super-block backups (for fsck -b #) at:
32, 36320, 72608, 108896, 145184, 181472, 217760, 252048,
290336, 326624, 362912, 399200, 435488, 471776, 508064, 544352,
```

```
:
```

```
7813664, 7849952, 7886240, 7922528, 7958816, 7995104, 8031392, 8067680,
8099872, 8136160, 8172448, 8208736, 8245024, 8281312, 8317600, 8353888,
```

6. Mount a new file system. For example:

```
mount /dev/disk/dskXc /mnt
```

7. Change directory to the new file system:

```
cd /mnt
```

8. Enter the following command to extract the NHD-7 kit into the CD image:

```
gzcat /usr/tmp/NHD7_REV_X7.1.tar.gz | tar xvf -
```

You will see a list of files as they are extracted.

9. Return to the root directory and unmount the CD image:

```
cd /
umount /mnt
```

You have created an NHD-7 CD image on the disk at `/dev/disk/dskXc`.

### 4.1.3 Preparing for a RIS installation

If you are installing NHD-7 from a RIS server, you first must do the following:

1. Set up the RIS area on the RIS server (Section 4.1.3.1).
2. Register the RIS client (Section 4.1.3.2).

---

#### Note

---

Although the examples in this section show the NHD-7 distribution on CD-ROM, you can use a CD image created from the downloaded NHD-7 kit, as described in Section 4.1.2.

---

See the *Sharing Software on a Local Area Network* manual for more information about RIS. The Troubleshooting RIS chapter is especially helpful if you encounter difficulties.

#### 4.1.3.1 Setting Up the RIS Area

Follow these steps to create a RIS area for NHD-7 on your RIS server:

1. Use the `ris` utility to install Version 5.1B of the base operating system into a new RIS area.

---

#### Caution

---

Use the standard method to create the RIS area, not the bootlink method.

Extract the base operating system; do not use symbolic links.

---

Optionally, you can install TruCluster Server and Worldwide Language Support in the same RIS area.

2. Load the NHD-7 CD-ROM into the RIS server's CD-ROM drive.
3. Mount the NHD-7 distribution. For example:

```
mount /dev/disk/cdrom0a /mnt
```

4. Run the `update_ris` script to install the NHD-7 kit into the RIS area. For example:

```
/mnt/tools/update_ris
```

You will see messages similar to the following:

```
Please select one of the following products to add NHD support to
```

```
1) /usr/var/adm/ris/ris9.alpha
'Tru64 UNIX V5.1x Operating System (Rev nnnn) '

2) /usr/var/adm/ris/ris6.alpha
'Tru64 UNIX V5.1x Operating System (Rev nnnn) '
```

```
Enter your selection or press <return> to quit:
```

---

### Note

---

The RIS areas you see depend upon your RIS server.

---

5. In this example, enter **2** and press Return. You will see messages similar to the following:

```
You are updating ris area /usr/var/adm/ris/ris6.alpha for:
V5.1x Operating System (Rev 1885)
with NHD support.
Is this correct? (y/n):
```

6. In this example, enter **y** and press Return. You will see messages similar to the following:

```
'Tru64 UNIX New Hardware for V5.1x'
1 'Tru64 UNIX New Hardware for V5.1x'
Building new network bootable kernel
/usr/var/adm/ris/ris6.alpha/kit has been updated with NHD-7 support
```

#### 4.1.3.2 Registering the RIS Client

See the *Sharing Software on a Local Area Network* manual for instructions on how to register RIS clients for a RIS area.

---

### Note

---

When you register a cluster as a RIS client, remember to register both the cluster alias and the lead cluster member. During client registration, you see the following prompt:

```
Is this client a cluster alias? (y/n) [n]:
```

- When you register a cluster alias, enter **y** and press Return.
  - When you register the lead cluster member, press Return. When prompted, enter the hardware address.
- 

## 4.2 Installing the NHD-7 Kit

This section tells you how to install the NHD-7 kit on a system in one of the following configurations:

- Single system already running Version 5.1B (Section 4.2.1)
- Single system during Full Installation of Version 5.1B:
  - Installing from a CD-ROM or CD image (Section 4.2.2.1)
  - Installing from RIS (Section 4.2.2.2)



- Cluster already running Version 5.1B (Section 4.2.3)
- Cluster during Full Installation of Version 5.1B (Section 4.2.4)

---

**Note**

---

You can install NHD-7 from CD-ROM or from a CD image that you create from the downloaded kit.

If you are installing NHD-7 during a Full Installation, you can install from a RIS area.

---

## 4.2.1 Installing on a Single System Running Version 5.1B

Before you start this procedure, you must have the NHD-7 distribution. See Section 1.2 for information about how to get the NHD-7 kit. See Section 4.1.2 on how to create an NHD-7 kit CD image for kits downloaded from the Web.

---

**Note**

---

You cannot use RIS to install NHD-7 on a single system running Version 5.1B

---



---

**Caution**

---

Before you install NHD-7 onto a system that includes SA5300A series RAID controllers, see the release notes in Section 3.5. Failure to follow these instructions can cause your NHD-7 installation to fail.

---

Follow these steps to install NHD-7 on a single system that already is running Version 5.1B of the Tru64 UNIX operating system:

1. Log in as `root`.
2. Mount the NHD-7 CD-ROM or the CD image you created in Section 4.1.2. For example:

```
mount /dev/disk/cdrom0a /mnt
```

or

```
mount /dev/disk/dskXc /mnt
```

3. Change directory to the mounted NHD-7 kit. For example:

```
cd /mnt
```

4. Run the `nhd_install` script:

```
./nhd_install
```

You will see output similar to the following:

```
Using kit at /mnt/540
```

```
"Would you like to install the V5.1x Tru64 Unix Patches: (y/n)
```

5. Answer **y** and press Return. You will see a list of the patches as they are installed, followed by output similar to the following:

```
Checking file system space required to install specified subsets:
```

```
File system space checked OK.
```

```
1 subsets will be installed.
```

```

Loading subset 1 of 1 ...

New Hardware Base System Support V7.0
 Copying from /mnt/540/kit (disk)
 Working....Mon Jul 21 13:59:55 EDT 2003

 Verifying

1 of 1 subsets installed successfully.

Configuring "New Hardware Base System Support V7.0" (OSHHWBASE540)

Rebuilding the /GENERIC file to include the kernel modules for the
new hardware. This may take a few minutes.

Successful setting of the new version identifier
Successful switch of the version identifiers

```

- At the shell prompt, shut down the system:

```
shutdown -h now
```

- At the console prompt, boot the generic kernel. For example:

```
>>> boot -fi genvmunix dqb0
```

- After the system boots, log in as root.

- At the shell prompt, use the doconfig utility to rebuild the custom kernel:

```
doconfig
```

You will see messages similar to the following:

```

*** KERNEL CONFIGURATION AND BUILD PROCEDURE ***

Enter a name for the kernel configuration file. [SYSNAME]:

A configuration file with the name 'SYSNAME' already exists.
Do you want to replace it? (y/n) [n]:

```

- Enter **y** and press Return. You will see messages similar to the following:

```

Saving /sys/conf/SYSNAME as /sys/conf/SYSNAME.bck

*** KERNEL OPTION SELECTION ***

Selection Kernel Option

1 System V Devices
2 NTP V3 Kernel Phase Lock Loop (NTP_TIME)
3 Kernel Breakpoint Debugger (KDEBUG)
4 Packetfilter driver (PACKETFILTER)
5 IP-in-IP Tunneling (IPTUNNEL)
6 IP Version 6 (IPV6)
7 Point-to-Point Protocol (PPP)
8 STREAMS pckt module (PCKT)
9 X/Open Transport Interface (XTISO, TIMOD, TIRDWR)
10 Digital Versatile Disk File System (DVDFS)
11 ISO 9660 Compact Disc File System (CDFS)
12 Audit Subsystem
13 ATM UNI 3.0/3.1 ILMI (ATMILMI3X)
14 IP Switching over ATM (ATMIFMP)
15 LAN Emulation over ATM (LANE)
16 Classical IP over ATM (ATMIP)
17 ATM UNI 3.0/3.1 Signalling for SVCs (UNI3X)
18 Asynchronous Transfer Mode (ATM)
19 All of the above
20 None of the above
21 Help
22 Display all options again

```

Enter your choices.

```
Choices (for example, 1 2 4-6) [20]:
```

- Select the kernel options you want built into your new custom kernel. Include the same options you were already running on your system. For example, if you want to select all listed kernel options, enter **19** and press Return.

You will see messages similar to the following:

```

You selected the following kernel options:
System V Devices
NTP V3 Kernel Phase Lock Loop (NTP_TIME)
Kernel Breakpoint Debugger (KDEEBUG)
Packetfilter driver (PACKETFILTER)
IP-in-IP Tunneling (IPTUNNEL)
IP Version 6 (IPV6)
Point-to-Point Protocol (PPP)
STREAMS pckt module (PCKT)
X/Open Transport Interface (XTISO, TIMOD, TIRDWR)
Digital Versatile Disk File System (DVDFS)
ISO 9660 Compact Disc File System (CDFS)
Audit Subsystem
ATM UNI 3.0/3.1 ILMI (ATMILMI3X)
IP Switching over ATM (ATMIFMP)
LAN Emulation over ATM (LANE)
Classical IP over ATM (ATMIP)
ATM UNI 3.0/3.1 Signalling for SVCs (UNI3X)
Asynchronous Transfer Mode (ATM)

```

Is that correct? (y/n) [y]:

12. Press Return to confirm your selection. You will see the following prompt:

```
Do you want to edit the configuration file? (y/n) [n]:
```

13. Press Return. You will see messages similar to the following:

```

*** PERFORMING KERNEL BUILD ***

A log file listing special device files is located in /dev/MAKEDEV.log
Working...Thu Jun 20 14:59:36 EDT 2003
Working...Thu Jun 20 15:01:53 EDT 2003
Working...Thu Jun 20 15:05:32 EDT 2003

The new kernel is /sys/SYSNAME/vmunix

```

14. Copy the new custom kernel to /vmunix. For example:

```
cp /sys/SYSNAME/vmunix /vmunix
```

15. Shut down the system:

```
shutdown -h now
```

16. At the console prompt, boot the system with the new custom kernel. For example:

```
>>> boot -fi "vmunix" dqb0
```

## 4.2.2 Installing on a Single System During a Full Installation of Version 5.1B

You can install NHD-7 on a single system during a Full Installation of the operating system from either of the following sources:

- NHD-7 kit on CD-ROM or on a CD image that you created from the downloaded kit (Section 4.2.2.1)
- NHD-7 kit in a RIS area along with the base operating system. (Section 4.2.2.2)

See Section 1.2 for information on getting the NHD kit, creating a CD image, and setting up a RIS area.

---

### Caution

---

Before you install NHD-7 onto a system that includes SA5300A series RAID controllers, see the release notes in Section 3.5. Failure to follow these instructions can cause your NHD-7 installation to fail.

---

#### 4.2.2.1 Installing from a CD-ROM or CD Image

Before you start this procedure, see the *Installation Guide* for information about the Full Installation process. You must have both the NHD-7 kit and the Tru64 UNIX Operating System distribution. See Section 1.2 for information about how to get the NHD-7 kit and, if necessary, create an NHD-7 kit CD image.

This process requires multiple CD-ROM swaps, which are documented in the directions that follow. The disk swaps are required because the addition and deletion of some global symbols in the operating system requires that some of the updated kernel `.mod` files contained in the NHD kit are boot linked in a specific order relative to the `.mod` files that are used from the Version 5.1B installation CD-ROMs.

You will be prompted in one of the following ways when the CD-ROM needs to be swapped:

- Insert media for kit `'dqa0:/540/usr/sys/hardware/base.kit'`  
This prompt means that the NHD CD-ROM must be in the CD drive.
- Insert boot media, hit `<return>` when ready:  
This prompt means that the operating system CD must be in the CD drive.

The following steps describe what you must do if you use two CD-ROMs and one CD drive. If you are using two CD drives or a CD image, adjust these steps as follows:

- If you are using multiple CD drives, you can place the NHD CD-ROM in one drive and the operating system installation CD-ROM in the other and will not have to swap CDs. When prompted for the “media for kit,” specify the console name of the CD drive containing the NHD CD-ROM. When prompted for the “boot media,” specify the console name of the drive containing the operating system CD-ROM.
- If you created a CD image of the NHD kit, you can place the operating system installation CD-ROM in the CD drive. When prompted for the “media for kit,” specify the console name of the disk containing the NHD CD-ROM. When prompted for the “boot media,” specify the console name of the drive containing the operating system CD-ROM.

1. If your system already is running a version of the operating system, log in as `root` and shut down the system.
2. Insert the Version 5.1B installation media in the CD drive. For the following steps, the drive is assumed to be `dqb0`.
3. At the console prompt, type the following:

```
>>> set bootdef_dev ""
```

4. At the console prompt, boot the generic kernel. For example:

```
>>> boot -fl fa -fi "GENERIC" dqb0
```

You will see messages similar to the following:

```
(boot dqb0.0.1.16.0 -file GENERIC -flags fa)
block 0 of dqb0.0.1.16.0 is a valid boot block
reading 15 blocks from dqb0.0.1.16.0
bootstrap code read in
base = 200000, image_start = 0, image_bytes = 1e00
initializing HWRPB at 2000
initializing page table at 3ff48000
initializing machine state
setting affinity to the primary CPU
jumping to bootstrap code
```

UNIX boot - Wednesday, August 01, 2001

Loading GENERIC ...  
Loading at fffffc0000250000

Enter all Foreign Hardware Kit Names.  
Device Names are entered as console names (e.g. dkb100).

Enter Device Name, or <return> if done:

---

**Note**

---

The message to enter foreign kit names starts the phase of the process where you specify kits and their locations. Do not enter a kit name here. Look at the actual prompt and enter the device name where the NHD-7 kit is located.

---

5. Enter the console device name of the CD-ROM drive at the prompt and press Return:

Enter Device Name, or <return> if done: **dqb0** **Return**

You will see a prompt similar to the following:

Enter Hardware Kit Name, or <return> if done with dqb0:

6. Enter the NHD-7 kit name and press Return:

**/540/usr/sys/hardware/base.kit** **Return**

You will see a prompt similar to the following:

Insert media for kit 'dqb0:/540/usr/sys/hardware/base.kit'  
hit <return> when ready, or 'q' to quit this kit:

7. Remove the Tru64 UNIX Operating System CD-ROM, load the New Hardware Delivery CD-ROM, and press Return.

8. Press Return at each of the following prompts you see:

Enter Hardware Kit Name, or <return> if done with dqa0: **Return**

Enter Device Name, or <return> if done: **Return**

You then see a prompt similar to the following:

Insert boot media, hit <return> when ready:

9. Remove the New Hardware Delivery CD-ROM, load the Tru64 UNIX Operating System CD-ROM, and press Return. You will see messages similar to the following:

Linking 207 objects: 207  
Insert media for kit 'dqb0:/540/usr/sys/hardware/base.kit'

10. Remove the Tru64 UNIX Operating System CD-ROM, load the New Hardware Delivery CD-ROM, and press Return. You will see messages similar to the following:

Linking 206 objects: 206  
Insert media for kit 'dqb0:/540/usr/sys/hardware/base.kit'

11. Remove the New Hardware Delivery CD-ROM, load the Tru64 UNIX Operating System CD-ROM, and press Return. You will see messages similar to the following:

205 204 203 202 201 200 199 198 197  
Insert media for kit 'dqb0:/540/usr/sys/hardware/base.kit'  
hit <Return> when ready or 'q' to quit:

12. Remove the Tru64 UNIX Operating System CD-ROM, load the New Hardware Delivery CD-ROM, and press Return. You will see messages similar to the following:

```
196
Insert boot media, hit <Return> when ready:
```

13. Remove the New Hardware Delivery CD-ROM, load the Tru64 UNIX Operating System CD-ROM, and press Return. You will see messages similar to the following:

```
195 194 193 192 191 190 189 188 187 186 185 184
Insert media for kit 'dqb0:/540/usr/sys/hardware/base.kit'
hit <Return> when ready or 'q' to quit:
```

14. Remove the Tru64 UNIX Operating System CD-ROM, load the New Hardware Delivery CD-ROM, and press Return. You will see messages similar to the following:

```
183
Insert boot media, hit <Return> when ready:
```

15. Remove the New Hardware Delivery CD-ROM, load the Tru64 UNIX Operating System CD-ROM, and press Return. You will see messages similar to the following:

```
182 181 180 179 178 177 176 175 174 173 172 171 170 169 168 167 166
165 164 163 162 161 160 159 158 157 156 155 154 153 152 151 150 149
```

:

```
50 49 48 47 46 45 44 43 42 41
Insert media for kit 'dqb0:/540/usr/sys/hardware/base.kit'
hit <Return> when ready or 'q' to quit:
```

16. Remove the Tru64 UNIX Operating System CD-ROM, load the New Hardware Delivery CD-ROM, and press Return. You will see messages similar to the following:

```
40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18
17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
Insert boot media, hit <Return> when ready:
```

17. Remove the New Hardware Delivery CD-ROM, load the Tru64 UNIX Operating System CD-ROM, and press Return. You will see messages similar to the following:

```
Sizes:
text = 8359680
data = 2151232
bss = 2433568
Starting at 0xfffffc0000262430
```

18. You will see the Tru64 UNIX installation screens. Enter host information, select subsets and target disks, and continue the Full Installation process as described in the *Installation Guide*.

After the final reboot, the Full Installation process configures the system and reboots the system.

You will see messages similar to the following:

```
UNIX boot - Wednesday, August 01, 2003
```

```
Loading /GENERIC ...
Loading at fffffc0000250000
```

```
Enter all Foreign Hardware Kit Names.
Device Names are entered as console names (e.g. dkb100).
```

Enter Device Name, or <return> if done:

19. Enter the console device name for the NHD-7 kit, for example: **dqb0**. You will see the following prompt:

Enter Hardware Kit Name, or <return> if done with dqb0:

20. Enter the NHD-7 kit name:

```
/540/usr/sys/hardware/base.kit
```

You will see a prompt similar to the following:

```
Insert media for kit 'dqb0:/540/usr/sys/hardware/base.kit'
hit <return> when ready, or 'q' to quit this kit:
```

21. Remove the Tru64 UNIX Operating System CD-ROM, load the New Hardware Delivery CD-ROM, and press Return. (You will not have to change media again.)

22. Press Return. You will see a prompt similar to the following:

Enter Hardware Kit Name, or <return> if done with dqb0:

23. Because there are no other kits included in NHD-7, press Return. You will see the following prompt:

Enter Device Name, or <return> if done:

24. Again, because there are no other kits to install, press Return. You will see the following prompt:

Insert boot media, hit <return> when ready:

---

**Note**

---

Although this prompt asks you to insert the boot media, do not insert the Tru64 UNIX Operating System CD-ROM. At this point in the installation process you are booting from the system disk, and no media change is necessary.

---

25. Press Return. You will see a prompt similar to the following:

```
Linking 207 objects: 207
```

```
:
```

```
Insert media for kit 'dka400:/540/usr/sys/hardware/base.kit'
hit <return> when ready or 'q' to quit:
```

26. Press Return. You will see messages similar to the following:

```
206
```

```
Insert boot media, hit <return> when ready:
```

---

**Note**

---

Although this prompt asks you to insert the boot media, do not insert the Tru64 UNIX Operating System CD-ROM. At this point in the installation process you are booting from the system disk, and no media change is necessary.

---

27. Press Return. You will see messages similar to the following:

```
205 204 203 202 201 200 199 198 197
```

```
Insert media for kit 'dqa0:/540/usr/sys/hardware/base.kit'
hit <Return> when ready or 'q' to quit:
```

28. Press Return. You will see messages similar to the following:

```
196
Insert boot media, hit <Return> when ready:
```

29. Press Return. You will see messages similar to the following:

```
195 194 193 192 191 190 189 188 187 186 185 184
Insert media for kit 'dqa0:/540/usr/sys/hardware/base.kit'
hit <Return> when ready or 'q' to quit:
```

30. Press Return. You will see messages similar to the following:

```
183
Insert boot media, hit <Return> when ready:
```

31. Press Return. You will see messages similar to the following:

```
182 181 180 179 178 177 176 175 174 173 172 171 170 169 168 167
:
61 60 59 58 57 56 55 54 53 52 51 50 49 48 47 46 45 44 43 42 41
Insert media for kit 'dqb0:/540/usr/sys/hardware/base.kit'
hit <Return> when ready or 'q' to quit:
```

32. Press Return. You will see messages similar to the following:

```
Insert boot media, hit <Return> when ready:
```

```
Sizes:
text = 8359680
data = 2151232
bss = 2433568
Starting at 0xfffffc0000262430
```

You will now see common system configuration messages and the installation of the NHD-7 and Version 5.1B patch kit. When the system boots one more time, the installation is complete.

33. Log in as `root` and configure your system from the System Setup Checklist. See the System Setup Checklist online help for more information.

#### 4.2.2.2 Installing from RIS

Before you start this procedure, see the *Installation Guide* for information about the Full Installation process. You must have both the NHD-7 kit and the Tru64 UNIX Operating System distribution. See Section 1.2 for information about how to get the NHD-7 kit and how to prepare for RIS installation.

1. If your system already is running a version of the operating system, log in as `root` and shut down the system.
2. At the console prompt, type the following:

```
>>> set bootdef_dev ""
```

3. At the console prompt, boot from the RIS server. For example:

```
>>> boot ewa0
```

You will see the operating system boot and the Full Installation user interface start.

4. Enter host information, select subsets and target disks, and continue the Full Installation process as described in the *Installation Guide*.

The following list describes differences you may see when you install NHD-7 from a RIS server:

- You may see the installation of the Version 5.1B Patch Kit before the kernel build.



- After the base operating system subsets are installed, you see the New Hardware Base System Support V7.0 subset installed from the RIS server.
- During system configuration, you may see messages similar to the following as NHD-7 is configured and the generic kernel is rebuilt:

```
Configuring "New Hardware Base System Support V7.0" (OSHHWBASE540)

Rebuilding the /GENERIC file to include the kernel modules for the
new hardware. This may take a few minutes.
```

5. You will see messages similar to the following as the kernel is rebuilt before the final reboot:

```
The system name assigned to your machine is 'sysname'.
*** KERNEL CONFIGURATION AND BUILD PROCEDURE ***
```

```
The system will now automatically build a kernel
with all options and then reboot. This can take
up to 15 minutes, depending on the processor type.
```

```
When the login prompt appears after the system
has rebooted, use 'root' as the login name and
the SUPERUSER password that was entered during
this procedure, to log into the system.
```

```
*** PERFORMING KERNEL BUILD ***
Working...Thu Jun 20 14:06:34 EDT 2003
```

```
The new version ID has been successfully set on this system.
The entire set of new functionality has been enabled.
```

```
This message is contained in the file /var/adm/smlogs/it.log for
future reference.syncing disks... done
rebooting.... (transferring to monitor)
```

The system reboots with the custom kernel, and you see the login prompt.

6. Log in as `root` and configure your system from the System Setup Checklist. See the System Setup Checklist online help for more information.

### 4.2.3 Installing on a Cluster Running Version 5.1B

Before you install NHD-7 on an existing cluster, see the Rolling Upgrade chapter in the TruCluster Server *Cluster Installation* manual. You must have the NHD-7 kit distribution, the Tru64 UNIX Operating System CD-ROM, and the Associated Products, Volume 2, CD-ROM, which includes the TruCluster Server software. See Section 1.2 for information about how to get the NHD-7 kit and, if necessary, create an NHD-7 kit CD image or prepare for RIS installation.

---

#### Caution

---

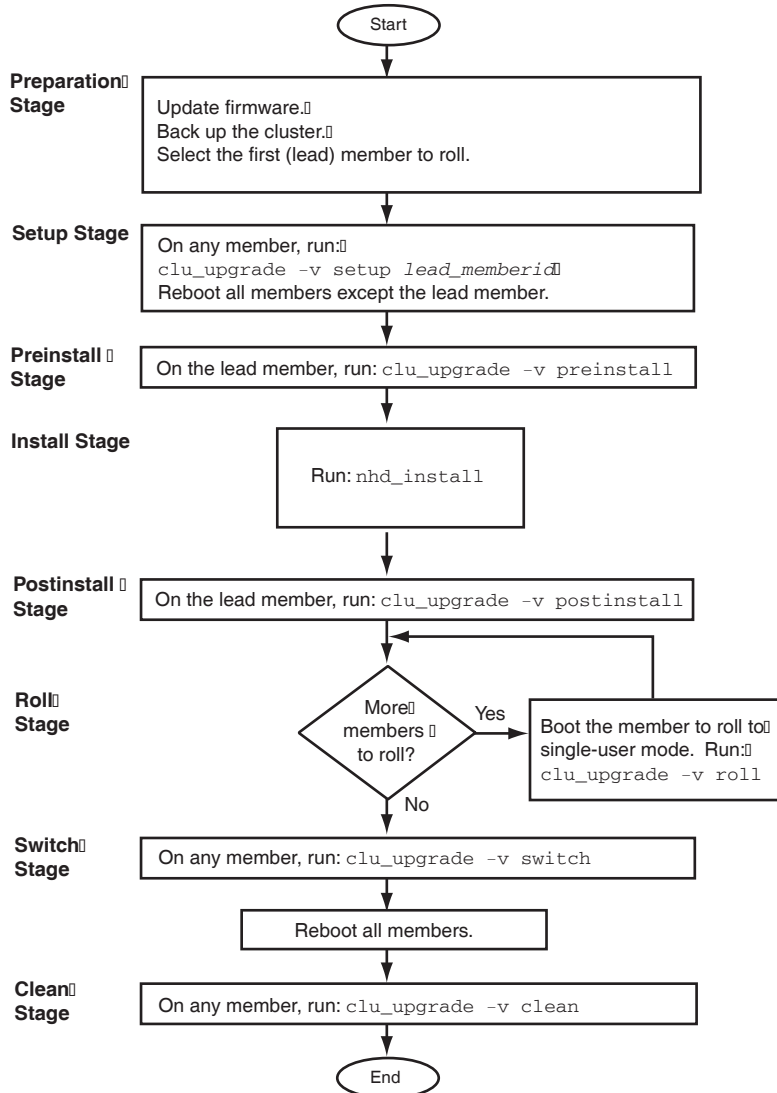
Before you install NHD-7 onto a system that includes SA5300A series RAID controllers, see the release notes in Section 3.5. Failure to follow these instructions can cause your NHD-7 installation to fail.

---

Perform a Rolling Upgrade as described in the following sections to install NHD-7 on an existing cluster. See the *clu\_upgrade Quick Reference Best Practice* and the Rolling Upgrade chapter in the TruCluster Server *Cluster Installation* manual for more information.

Figure 4-1 shows a simplified flow chart of the tasks and stages that are part of an NHD Rolling Upgrade.

**Figure 4-1: NHD Rolling Upgrade**



ZK-1870U-AI

#### 4.2.3.1 Preparation Stage

Perform the tasks in the Rolling Upgrade Preparation Stage. See the Rolling Upgrade chapter in the TruCluster Server *Cluster Installation* manual for more information.

#### 4.2.3.2 Setup Stage

Perform the following steps in the Setup Stage:

1. Use the `clu_upgrade` command to start the Setup Stage. For example, if the lead member has member ID 1:

```
clu_upgrade -v setup 1
```

You will see the following messages:

```
Retrieving cluster upgrade status.
```

```
This is the cluster upgrade program.
```

```
You have indicated that you want to perform the 'setup' stage of the upgrade.
```

```
Do you want to continue to upgrade the cluster? [yes]:
```

2. Press Return. You will see the following messages:

What type of rolling upgrade will be performed?

```
Selection Type of Upgrade

1 An upgrade using the installupdate command
2 A patch using the dupatch command
3 A new hardware delivery using the nhd_install command
4 All of the above
5 None of the above
6 Help
7 Display all options again

```

Enter your Choices (for example, 1 2 2-3):

3. Enter **2 3** and press Return. You will see the following messages:

```
You selected the following rolling upgrade options: 2 3
Is that correct? (y/n) [y]:
```

4. Enter **y** and press Return. You will see the following messages:

```
Enter the full pathname of the patch kit kit mount point ['???']:
```

5. Enter the NHD kit mount point, **/mnt/540/Tru64UNIX\_Patches**, and press Return. You will see the following messages:

```
A patch kit has been found in the following location:
```

```
/mnt/nnn/Tru64UNIX_Patches
```

```
This kit has the following version information:
```

```
'"Tru64 UNIX V5.1x Patch Distribution"
(T64V51BB24AS0003-20030627PatchTools540,27-Jun-2003:16:04:41)'
```

```
Is this the correct nhd kit for the update being performed? [yes]:
```

6. Press Return. You will see the following message:

```
Enter the full pathname of the nhd kit mount point ['???']:
```

7. Enter the NHD kit mount point, **/mnt**, and press Return. You will see the following messages:

```
A nhd kit has been found in the following location:
```

```
/mnt
```

```
This kit has the following version information:
```

```
'Tru64 UNIX New Hardware for V5.1x'
```

```
Is this the correct nhd kit for the update being performed? [yes]:
```

8. Enter **yes** and press Return . You will see the following messages:

```
Checking inventory and available disk space.
Marking stage 'setup' as 'started'.
Copying NHD kit '/mnt' to '/var/adm/update/NHDKit/'.
nhd_install -copy 540 /var/adm/update/NHDKit/
```

```
Creating tagged files.
```

```
.....
```

```
The cluster upgrade 'setup' stage has completed successfully.
Reboot all cluster members except member: '1'
Marking stage 'setup' as 'completed'.
```

```
The 'setup' stage of the upgrade has completed successfully.
```

---

### Note

---

You may see the following message during this step:

```
clubase: Entry not found in /cluster/admin/tmp/stanza.stdin.530756
```

This is a known error and can be ignored.

---

9. Reboot all your cluster members except the lead member. See the Rolling Upgrade chapter in the TruCluster Server *Cluster Installation* manual for more information.

### 4.2.3.3 Preinstall Stage

Perform the following steps in the Preinstall Stage:

1. Use the `clu_upgrade` command to start the Preinstall Stage:

```
clu_upgrade -v preinstall
```

You will see the following messages:

```
Retrieving cluster upgrade status.
```

```
This is the cluster upgrade program.
You have indicated that you want to perform the 'preinstall' stage of the
upgrade.
```

```
Do you want to continue to upgrade the cluster? [yes]:
```

2. Enter **yes** and press Return . You will see the following messages:

```
clu_upgrade has previously created the required tagged files and would
normally check and repair any tagged files which may have been modified
since they were created. If you feel that the tagged files have not changed
since they were created you may bypass these checks and continue with the
rolling upgrade.
```

```
Do you wish to skip tag file checking? [no]:
```

3. If the Preinstall Stage is performed immediately after the Setup Stage, you can skip tagged file checking. If time has elapsed between the Setup Stage and Preinstall Stage, you may want to check the tagged files. The prompt asks if you want to skip tagged file checking.

- If you want to check tagged files, enter **no** at the prompt and press Return. You will see the following message, followed by a progress indicator and by informational messages about the end of the preinstall stage:

```
Checking tagged files.
.....
```

- If you want to skip tagged file checking, enter **yes** and press Return. You will see informational messages about the end of the preinstall stage:

```
Marking stage 'preinstall' as 'started'.
```

```
Backing up member-specific data for member: 1
```

```
Marking stage 'preinstall' as 'completed'.
The cluster upgrade 'preinstall' stage has completed successfully.
You can now run the nhd_install command on the lead member.
```

```
The 'preinstall' stage of the upgrade has completed successfully.
```

---

#### Note

---

If you see the following message you can ignore it.

```
. find: bad starting directory
```

This is a known error and can be ignored.

---

### 4.2.3.4 Install Stage

Perform the following steps in the Install Stage:

1. Make sure that the NHD-7 distribution is still mounted.

2. Change directory to the mounted NHD-7 kit. For example:

```
cd /mnt
```

3. Use the `nhd_install` script to install the NHD-7 kit on the lead member:

```
./nhd_install
```

4. Answer yes to the following question and press Return:

```
NHD installation also requires installing patches
Would you like to install the NHD Kit, Tru64_UNIX_V5.1B and
TruCluster_V5.1B Patches: (y/n) [y]: y Return
```

5. At the shell prompt, shut down the system:

```
shutdown -h now
```

6. At the console prompt, boot the generic kernel. For example:

```
>>> boot -fi genvmunix dqb0
```

7. After the system boots, log in as `root`.

8. At the shell prompt, use the `doconfig` utility to rebuild the custom kernel:

```
doconfig
```

You will see messages similar to the following:

```
*** KERNEL CONFIGURATION AND BUILD PROCEDURE ***

Enter a name for the kernel configuration file. [SYSNAME]:
```

9. Press Return to accept the default. You will see messages similar to the following:

```
A configuration file with the name 'SYSNAME' already exists.
Do you want to replace it? (y/n) [n]:
```

10. Enter **y** and press Return. You will see messages similar to the following:

```
Saving /sys/conf/SYSNAME as /sys/conf/SYSNAME.bck
```

```
*** KERNEL OPTION SELECTION ***
```

```
Selection Kernel Option

1 System V Devices
2 NTP V3 Kernel Phase Lock Loop (NTP_TIME)
3 Kernel Breakpoint Debugger (KDEBUG)
4 Packetfilter driver (PACKETFILTER)
5 IP-in-IP Tunneling (IPTUNNEL)
6 IP Version 6 (IPV6)
7 Point-to-Point Protocol (PPP)
8 STREAMS pckt module (PCKT)
9 X/Open Transport Interface (XTISO, TIMOD, TIRDWR)
10 Digital Versatile Disk File System (DVDFS)
11 ISO 9660 Compact Disc File System (CDFS)
12 Audit Subsystem
13 ATM UNI 3.0/3.1 ILMI (ATMILMI3X)
14 IP Switching over ATM (ATMIFMP)
15 LAN Emulation over ATM (LANE)
16 Classical IP over ATM (ATMIP)
17 ATM UNI 3.0/3.1 Signalling for SVCs (UNI3X)
18 Asynchronous Transfer Mode (ATM)
19 All of the above
20 None of the above
21 Help
22 Display all options again

```

```
Enter your choices.
```

```
Choices (for example, 1 2 4-6) [20]:
```

11. Select the kernel options you want built into your new custom kernel. Include the same options you were already running on your system. In this example, if you want to select all listed kernel options, enter **19** and press Return.

You will see messages similar to the following:

```

You selected the following kernel options:
System V Devices
NTP V3 Kernel Phase Lock Loop (NTP_TIME)
Kernel Breakpoint Debugger (KDEEBUG)
Packetfilter driver (PACKETFILTER)
IP-in-IP Tunneling (IPTUNNEL)
IP Version 6 (IPV6)
Point-to-Point Protocol (PPP)
STREAMS pckt module (PCKT)
X/Open Transport Interface (XTISO, TIMOD, TIRDWR)
Digital Versatile Disk File System (DVDFS)
ISO 9660 Compact Disc File System (CDFS)
Audit Subsystem
ATM UNI 3.0/3.1 ILMI (ATMILMI3X)
IP Switching over ATM (ATMIFMP)
LAN Emulation over ATM (LANE)
Classical IP over ATM (ATMIP)
ATM UNI 3.0/3.1 Signalling for SVCs (UNI3X)
Asynchronous Transfer Mode (ATM)

```

Is that correct? (y/n) [y]:

- Enter **y** to confirm your selection and press Return. You will see the following prompt:

```
Do you want to edit the configuration file? (y/n) [n]:
```

- Enter **n** and press Return. You will see messages similar to the following:

```

*** PERFORMING KERNEL BUILD ***

A log file listing special device files is located in /dev/MAKEDEV.log
Working...Thu Jun 20 14:59:36 EDT 2003
Working...Thu Jun 20 15:01:53 EDT 2003
Working...Thu Jun 20 15:05:32 EDT 2003

The new kernel is /sys/SYSNAME/vmunix

```

- Copy the new custom kernel to the member-specific directory on the lead member. For example:

```
cp /sys/SYSNAME/vmunix /cluster/members/memberN/boot_partition
```

- Shut down the lead member:

```
shutdown -h now
```

- At the console prompt, boot the lead member with the new custom kernel. For example:

```
>>> boot -fi "vmunix" dqb0
```

- Log in as `root` on the lead member.

- Use the `clu_upgrade` command to check the installation status:

```
clu_upgrade -v
```

You will see messages similar to the following:

```

Retrieving cluster upgrade status.
Upgrade Status

Stage Status Date

setup started: Thu Jun 20 16:50:43 EDT 2003
 lead member: 1
 nhd kit source: /mnt
 completed: Thu Jun 20 16:52:34 EDT 2003

preinstall started: Thu Jun 20 16:54:46 EDT 2003
 completed: Thu Jun 20 16:55:16 EDT 2003

nhd started: Thu Jun 20 16:55:57 EDT 2003
 completed: Thu Jun 20 16:57:42 EDT 2003

Member Status Tagged File Status
ID Hostname State Rolled Running with On Next Boot

```

```
1 member01.site.place.net UP Yes No No
```

### 4.2.3.5 Postinstall Stage

Perform the following steps in the Postinstall Stage:

1. On the lead member, use the `clu_upgrade` command to start the Postinstall Stage:

```
clu_upgrade -v postinstall
```

You will see the following messages:

```
Retrieving cluster upgrade status.
```

```
This is the cluster upgrade program.
```

```
You have indicated that you want to perform the 'postinstall' stage of the upgrade.
```

```
Do you want to continue to upgrade the cluster? [yes]:
```

2. Enter **yes** and press Return . You will see the following messages:

```
Marking stage 'postinstall' as 'started'.
```

```
Marking stage 'postinstall' as 'completed'.
```

```
The 'postinstall' stage of the upgrade has completed successfully.
```

3. Use the `clu_upgrade` command to check the installation status:

```
clu_upgrade -v
```

You will see messages similar to the following:

```
Retrieving cluster upgrade status.
```

```
Upgrade Status
```

| Stage       | Status          | Date                         |
|-------------|-----------------|------------------------------|
| setup       | started:        | Thu Jun 20 16:50:43 EDT 2003 |
|             | lead member:    | 1                            |
|             | nhd kit source: | /mnt                         |
|             | completed:      | Thu Jun 20 16:52:34 EDT 2003 |
| preinstall  | started:        | Thu Jun 20 16:54:46 EDT 2003 |
|             | completed:      | Thu Jun 20 16:55:16 EDT 2003 |
| nhd         | started:        | Thu Jun 20 16:55:57 EDT 2003 |
|             | completed:      | Thu Jun 20 16:57:42 EDT 2003 |
| postinstall | started:        | Thu Jun 20 16:58:28 EDT 2003 |
|             | completed:      | Thu Jun 20 16:58:28 EDT 2003 |
| roll        | started:        | Thu Jun 20 16:58:29 EDT 2003 |
|             | members rolled: | 1                            |
|             | completed:      | Thu Jun 20 16:58:29 EDT 2003 |

| ID | Hostname                | Member Status | State  | Tagged File  | Status       |
|----|-------------------------|---------------|--------|--------------|--------------|
|    |                         |               | Rolled | Running with | On Next Boot |
| 1  | member01.site.place.net | UP            | Yes    | No           | No           |
| 10 | member10.site.place.net | UP            | No     | Yes          | Yes          |

### 4.2.3.6 Roll Stage

Before running the Roll Stage, see the Rolling Upgrade chapter in the TruCluster Server *Cluster Installation* manual.

Perform the following steps for each additional cluster member:

1. Log in to the cluster member as `root`.

2. Shut down the cluster member:

```
shutdown -h now
```

3. At the console prompt, boot the cluster member to single-user mode:

```
>>> boot -fl s
```

4. Use the `init s` command to initialize process control:

```
init s
```

5. Use the `bcheckrc` command to mount and check local file systems:

```
bcheckrc
```

You will see output similar to the following:

```
Checking device naming:
 Passed.
CNX QDISK: Successfully claimed quorum disk, adding 1 vote.
Checking local filesystems
Mounting / (root)
user_cfg_pt: reconfigured
root_mounted_rw: reconfigured
Mounting /cluster/members/member57/boot_partition (boot file system)
user_cfg_pt: reconfigured
root_mounted_rw: reconfigured
user_cfg_pt: reconfigured
dsfmgr: NOTE: updating kernel basenames for system at /
 scp kevM tty00 tty01 lp0 dsk3 dsk4 dsk5 dsk6 dsk7 dsk8 floppy1 cdrom1 dmapi
Mounting local filesystems
exec: /sbin/mount_advfs -F 0x14000 cluster_root#root /
cluster_root#root on / type advfs (rw)
exec: /sbin/mount_advfs -F 0x4000 cluster_usr#usr /usr
cluster_usr#usr on /usr: Device busy
exec: /sbin/mount_advfs -F 0x4000 cluster_var#var /var
cluster_var#var on /var: Device busy
/proc on /proc type procfs (rw)
```

6. Use the `lmf reset` command to copy license information into the kernel cache:

```
lmf reset
```

7. Use the `clu_upgrade` command to start the Roll Stage:

```
clu_upgrade -v roll
```

You will see messages similar to the following:

```
This is the cluster upgrade program.
You have indicated that you want to perform the 'roll' stage of the
upgrade.
```

```
Do you want to continue to upgrade the cluster? [yes]:
```

8. Enter **yes** and press Return .

---

### Note

---

You may see the following message during this step:

```
clubase: Entry not found in /cluster/admin/tmp/stanza.stdin.530756
```

This is a known error and can be ignored.

You also may see messages similar to the following:

```
*** Warning ***
The cluster upgrade command was unable to find or verify the configuration
file used to build this member's kernel. clu_upgrade attempts to make a
backup copy of the configuration file which it would restore as required
during a clu_upgrade undo command. To use the default configuration file
or to continue without backing up a configuration file hit return.
Enter the name of the configuration file for this member [SYSNAME]:
```

Press Return to use *SYSNAME* as the configuration file name.

---

You will see messages similar to the following:

```
Backing up member-specific data for member: 10

The 'roll' stage has completed successfully. This
```



member must be rebooted in order to run with the newly installed software.  
Do you want to reboot this member at this time? []:

9. Enter **y** and press Return. You will see the following message:

```
You indicated that you want to reboot this member at this time.
Is that correct? [yes]:
```

10. Enter **y** and press Return. You will see messages similar to the following:

```
The 'roll' stage of the upgrade has completed successfully.
Terminated
syncing disks... done
drd: Clean Shutdown
rebooting.... (transferring to monitor)
```

The cluster member reboots and reconfigures.

11. Use the `clu_upgrade` command to check the installation status:

```
clu_upgrade -v
```

You will see messages similar to the following:

```
Retrieving cluster upgrade status.
Upgrade Status
```

| Stage       | Status                       | Date                                      |
|-------------|------------------------------|-------------------------------------------|
| setup       | started:                     | Thu Jun 20 16:40:07 EDT 2003              |
|             | lead member:                 | 1                                         |
|             | nhd kit source:              | /mnt                                      |
|             | tagged files list:           | /cluster/admin/clu_upgrade/tag_files.list |
|             | tagged files missing:        | /cluster/admin/clu_upgrade/tag_files.miss |
| completed:  | Thu Jun 20 16:42:48 EDT 2003 |                                           |
| preinstall  | started:                     | Thu Jun 20 16:51:09 EDT 2003              |
|             | completed:                   | Thu Jun 20 16:52:32 EDT 2003              |
| nhd         | started:                     | Thu Jun 20 16:54:49 EDT 2003              |
|             | completed:                   | Thu Jun 20 16:58:08 EDT 2003              |
| postinstall | started:                     | Thu Jun 20 17:18:12 EDT 2003              |
|             | completed:                   | Thu Jun 20 17:18:12 EDT 2003              |
| roll        | started:                     | Thu Jun 20 17:22:24 EDT 2003              |
|             | members rolled:              | 1 10                                      |
|             | completed:                   | Thu Jun 20 17:32:42 EDT 2003              |

| ID | Hostname                | Member Status | State | Rolled | Tagged File Running with | Status On Next Boot |
|----|-------------------------|---------------|-------|--------|--------------------------|---------------------|
| 1  | member01.site.place.net | UP            | Yes   | No     | No                       |                     |
| 10 | member10.site.place.net | UP            | Yes   | No     | No                       |                     |

Repeat this process for each remaining cluster member.

### 4.2.3.7 Switch Stage

Perform the following steps in the Switch Stage:

1. After the Roll Stage is complete, use the `clu_upgrade` command to start the Switch Stage on any cluster member:

```
clu_upgrade -v switch
```

You will see the following messages:

```
Retrieving cluster upgrade status.
```

```
This is the cluster upgrade program.
You have indicated that you want to perform the 'switch' stage of the
upgrade.
```

```
Do you want to continue to upgrade the cluster? [yes]:
```

2. Enter **yes** and press Return . You will see the following messages:

```
Initiating version switch on cluster members
.Marking stage 'switch' as 'started'.
```

```
Switch already switched

Marking stage 'switch' as 'completed'.
The cluster upgrade 'switch' stage has completed successfully.
All cluster members must be rebooted before running the 'clean' command.

The 'switch' stage of the upgrade has completed successfully.
```

3. After you complete the Switch Stage, reboot all cluster members. After each member reboots, you see the login prompt.
4. Log in to the system as `root`.
5. Use the `clu_upgrade` command to check the installation status:

```
clu_upgrade -v
```

You will see messages similar to the following:

```
Retrieving cluster upgrade status.
Upgrade Status

Stage Status Date

setup started: Thu Jun 20 16:40:07 EDT 2003
 lead member: 1
 nhd kit source: /mnt
 tagged files list: /cluster/admin/clu_upgrade/tag_files.list
 tagged files missing: /cluster/admin/clu_upgrade/tag_files.miss
 completed: Thu Jun 20 16:42:48 EDT 2003

preinstall started: Thu Jun 20 16:51:09 EDT 2003
 completed: Thu Jun 20 16:52:32 EDT 2003

nhd started: Thu Jun 20 16:54:49 EDT 2003
 completed: Thu Jun 20 16:58:08 EDT 2003

postinstall started: Thu Jun 20 17:18:12 EDT 2003
 completed: Thu Jun 20 17:18:12 EDT 2003

roll started: Thu Jun 20 17:22:24 EDT 2003
 members rolled: 1 10
 completed: Thu Jun 20 17:32:42 EDT 2003

switch started: Thu Jun 20 16:37:50 EDT 2003
 completed: Thu Jun 20 16:38:20 EDT 2003

Member Status
ID Hostname State Rolled Tagged File Status
Running with On Next Boot

1 member01.site.place.net UP Yes No No
```

### 4.2.3.8 Clean Stage

Perform the following steps in the Clean Stage:

1. After the Switch Stage is complete, use the `clu_upgrade` command to start the Clean Stage on any cluster member:

```
clu_upgrade -v clean
```

You will see the following messages:

```
Retrieving cluster upgrade status.

This is the cluster upgrade program.
You have indicated that you want to perform the 'clean' stage of the
upgrade.

Do you want to continue to upgrade the cluster? [yes]:
```

2. Enter **yes** and press Return . You will see the following messages:

```
.Marking stage 'clean' as 'started'.

Deleting tagged files.
....
```

```
Removing back-up and kit files
Marking stage 'clean' as 'completed'.
The 'clean' stage of the upgrade has completed successfully.
```

3. Use the `clu_upgrade` command to check the installation status:

```
clu_upgrade -v
```

You will see messages similar to the following:

```
Retrieving cluster upgrade status.
There is currently no cluster upgrade in progress.

The last cluster upgrade completed successfully on:
Thu Jun 20 17:05:25 EDT 2003
History for this upgrade can be found in the directory:
 /cluster/admin/clu_upgrade/history/Compaq.Tru64.UNIX.V5.1x.Rev.1885-1
```

#### 4.2.4 Installing on a Cluster During a Full Installation of Version 5.1B

Before you start this procedure, see the TruCluster Server *Cluster Installation* manual for information about creating a cluster. You must have the NHD-7 kit distribution, the Version 5.1B Tru64 UNIX Operating System CD-ROM, and the Associated Products, Volume 2, CD-ROM, which includes the Version 5.1B TruCluster Server software.

---

#### Caution

---

Before you install NHD-7 onto a system that includes SA5300A series RAID controllers, see the release notes in Section 3.5. Failure to follow these instructions can cause your NHD-7 installation to fail.

---

Follow these steps to install NHD-7 on a new cluster during a Full Installation:

1. Install NHD-7 during a Full Installation on the system that will be the first cluster member, as described in Section 4.2.2.
2. Load the Version 5.1B Associated Products, Volume 2, CD-ROM into the CD-ROM drive.
3. Mount the Associated Products, Volume 2, CD-ROM. For example:

```
mount /dev/disk/cdrom0a /mnt
```

4. Use the `setld -l` command to load the TruCluster Server software:

```
setld -l /mnt/TruCluster/kit
```

You will see output similar to the following:

```
*** Enter subset selections ***

The following subsets are mandatory and will be installed automatically
unless you choose to exit without installing any subsets:

 * TruCluster Base Components

The subsets listed below are optional:

 There may be more optional subsets than can be presented on a single
 screen. If this is the case, you can choose subsets screen by screen
 or all at once on the last screen. All of the choices you make will
 be collected for your confirmation before any subsets are installed.

- TruCluster(TM) Software :
 1) TruCluster Migration Components
 2) TruCluster Reference Pages

Estimated free disk space(MB) in root:269.2 usr:18175.4 var:18665.0

Choices (for example, 1 2 4-6):
```

Or you may choose one of the following options:

- 3) ALL mandatory and all optional subsets
- 4) MANDATORY subsets only
- 5) CANCEL selections and redisplay menus
- 6) EXIT without installing any subsets

Estimated free disk space (MB) in root:269.2 usr:18175.4 var:18665.0

Enter your choices or press RETURN to redisplay menus.

Choices (for example, 1 2 4-6):

5. Enter **3** to select all mandatory and optional subsets. You will see output similar to the following:

You are installing the following mandatory subsets:

TruCluster Base Components

You are installing the following optional subsets:

- TruCluster(TM) Software :
- TruCluster Migration Components
- TruCluster Reference Pages

Estimated free disk space (MB) in root:269.2 usr:18173.6 var:18665.0

Is this correct? (y/n):

6. Enter **y** to confirm your selection. You will see output similar to the following:

Checking file system space required to install selected subsets:

File system space checked OK.

3 subsets will be installed.

Loading subset 1 of 3 ...

TruCluster Migration Components  
Copying from /mnt/TruCluster/kit (disk)  
Verifying

Loading subset 2 of 3 ...

TruCluster Reference Pages  
Copying from /mnt/TruCluster/kit (disk)  
Verifying

Loading subset 3 of 3 ...

TruCluster Base Components  
Copying from /mnt/TruCluster/kit (disk)  
Verifying

3 of 3 subsets installed successfully.

Configuring "TruCluster Migration Components" (TCRMIGRATE540)

Configuring "TruCluster Reference Pages" (TCRMAN540)  
Running : /usr/sbin/mkwhatiss : in the background...

Configuring "TruCluster Base Components" (TCRBASE540)

Use /usr/sbin/clu\_create to create a cluster.

7. Change to the root directory and unmount the Associated Products, Volume 2, CD-ROM:

```
cd /
umount /mnt
```

8. Remove the Associated Products, Volume 2, CD-ROM and load the New Hardware Delivery CD-ROM.

9. Mount the NHD-7 kit. For example:

```
mount /dev/disk/cdrom0a /mnt
```

10. Change directory to the mounted NHD-7 ki:

```
cd /mnt
```

11. Enter the following command to install the NHD cluster kit:

```
./nhd_install
```

---

### Note

---

The `nhd_install` script checks your system before installing the NHD cluster kit. You do not have to use the `-install_cluster` argument.

---

You will see output similar to the following:

```
Checking file system space required to install specified subsets:

File system space checked OK.

1 subsets will be installed.

Loading subset 1 of 1 ...

New Hardware TruCluster(TM) Support V6.0
 Copying from /mnt/540/kit (disk)
 Working...Thu Jun 20 18:16:41 EDT 2003
 Verifying

1 of 1 subsets installed successfully.

Configuring "New Hardware TruCluster(TM) Support V6.0" (OSHTCRBASE540)

The installation of the New Hardware TruCluster(TM) Support V6.0 (OSHTCRBASE540)
software subset is complete.
```

12. After installing the NHD cluster kit, use the `clu_create` command to create a single-member cluster, as described in the *TruCluster Server Cluster Installation* manual.
13. Add additional cluster members as needed. See the *TruCluster Server Cluster Installation* manual for more information.

## 4.2.5 Rebuilding the Kernel After Adding Supported Hardware

The preceding instructions tell you to install the supported hardware before you install the NHD-7 kit. There may be circumstances where you must add supported hardware after NHD-7 is already installed on your system. For example, you may add a Smart Array 5304 RAID controller to an existing AlphaServer DS25 system.

Follow these instructions to include support for the new hardware in your custom kernel on either the single system or the cluster member where you install the new hardware:

1. At the shell prompt, shut down the system:  

```
shutdown -h now
```
2. Make sure that the value of the `auto_action` console variable is set to `halt`:  

```
>>> set auto_action halt
```
3. Power down the system, install the new hardware, and power up the system.
4. At the console prompt, boot the generic kernel:  

```
>>> boot -fi genvmunix dqb0
```
5. After the system boots, log in as `root`.
6. At the shell prompt, use the `doconfig` utility to rebuild the custom kernel:  

```
doconfig
```

You will see messages similar to the following:

```
*** KERNEL CONFIGURATION AND BUILD PROCEDURE ***
Enter a name for the kernel configuration file. [SYSNAME]:
```

7. Press Return to accept the default. You will see messages similar to the following:

```
A configuration file with the name 'SYSNAME' already exists.
Do you want to replace it? (y/n) [n]:
```

8. Enter **y** and press Return. You will see messages similar to the following:

```
Saving /sys/conf/SYSNAME as /sys/conf/SYSNAME.bck
*** KERNEL OPTION SELECTION ***

Selection Kernel Option

1 System V Devices
2 NTP V3 Kernel Phase Lock Loop (NTP_TIME)
3 Kernel Breakpoint Debugger (KDEBUG)
4 Packetfilter driver (PACKETFILTER)
5 IP-in-IP Tunneling (IPTUNNEL)
6 IP Version 6 (IPV6)
7 Point-to-Point Protocol (PPP)
8 STREAMS pckt module (PCKT)
9 X/Open Transport Interface (XTISO, TIMOD, TIRDWR)
10 Digital Versatile Disk File System (DVDFS)
11 ISO 9660 Compact Disc File System (CDFS)
12 Audit Subsystem
13 ATM UNI 3.0/3.1 ILMI (ATMILMI3X)
14 IP Switching over ATM (ATMIFMP)
15 LAN Emulation over ATM (LANE)
16 Classical IP over ATM (ATMIP)
17 ATM UNI 3.0/3.1 Signalling for SVCs (UNI3X)
18 Asynchronous Transfer Mode (ATM)
19 All of the above
20 None of the above
21 Help
22 Display all options again

Enter your choices.

Choices (for example, 1 2 4-6) [20]:
```

9. Select the kernel options you want built into your new custom kernel. Include the same options you were already running on your system. In this example, if you want to select all listed kernel options, enter **19** and press Return.

You will see messages similar to the following:

```
You selected the following kernel options:
System V Devices
NTP V3 Kernel Phase Lock Loop (NTP_TIME)
Kernel Breakpoint Debugger (KDEBUG)
Packetfilter driver (PACKETFILTER)
IP-in-IP Tunneling (IPTUNNEL)
IP Version 6 (IPV6)
Point-to-Point Protocol (PPP)
STREAMS pckt module (PCKT)
X/Open Transport Interface (XTISO, TIMOD, TIRDWR)
Digital Versatile Disk File System (DVDFS)
ISO 9660 Compact Disc File System (CDFS)
Audit Subsystem
ATM UNI 3.0/3.1 ILMI (ATMILMI3X)
IP Switching over ATM (ATMIFMP)
LAN Emulation over ATM (LANE)
Classical IP over ATM (ATMIP)
ATM UNI 3.0/3.1 Signalling for SVCs (UNI3X)
Asynchronous Transfer Mode (ATM)

Is that correct? (y/n) [y]:
```

10. Enter **y** to confirm your selection and press Return. You will see the following prompt:

```
Do you want to edit the configuration file? (y/n) [n]:
```

11. Enter **n** and press Return. You will see messages similar to the following:

```
*** PERFORMING KERNEL BUILD ***

A log file listing special device files is located in /dev/MAKEDEV.log
Working...Thu Jun 20 14:59:36 EDT 2003
Working...Thu Jun 20 15:01:53 EDT 2003
Working...Thu Jun 20 15:05:32 EDT 2003

The new kernel is /sys/SYSNAME/vmunix
```

12. Copy the new custom kernel.

- On a single system, use the following command to copy the new custom kernel to /vmunix:

```
cp /sys/SYSNAME/vmunix /vmunix
```

- On cluster member *N* where you installed the hardware, use the following command to copy the new custom kernel to the member-specific directory:

```
cp /sys/SYSNAME/vmunix /cluster/members/memberN/boot_partition
```

13. Shut down your system:

```
shutdown -h now
```

14. At the console prompt, boot the lead member with the new custom kernel:

```
>>> boot -fi "vmunix" dqb0
```





---

## NHD for Version 5.1A Installation Instructions

This chapter tells you how to prepare for installation, where to get the NHD-7 kit, and how to install it on your Version 5.1A system. It includes the following topics:

- Preparing to install NHD (Section 5.1)
- Installing the NHD kit (Section 5.2)

See Chapter 4 for instructions on installing NHD-7 on Version 5.1B systems.

### 5.1 Preparing for the Installation

This section describes preliminary steps to take when installing the NHD-7 kit. It also describes the following:

- How to create a CD image on disk (Section 5.1.2), which you must do if you downloaded your kit from the Web.
- How to prepare your system for installing from a Remote Installation Services (RIS) server (Section 5.1.3).

#### 5.1.1 Preliminary Steps

Follow these steps before you install NHD-7:

1. If your system already is running Version 5.1A of the operating system, perform a full backup of your system.
2. Get the NHD-7 kit as described in Section 1.2.
3. Create an NHD-7 kit CD image as described in Section 5.1.2.
4. If you are installing from a RIS server, perform the following tasks:
  - a. Set up the RIS area as described in Section 5.1.3.1.
  - b. Register your system as a RIS client as described in Section 5.1.3.2.

See the *Sharing Software on a Local Area Network* manual for more information about RIS.

5. If your system already is running a version of the operating system, shut down your system./
6. Upgrade your system to the latest version of firmware for your processor.
7. Determine the console name of your system disk and any devices you will use for software distributions, such as the NHD-7 kit, the Tru64 UNIX operating system distribution, and the Associated Products, Volume 2, distribution for TruCluster software. This could include the following:
  - Any CD-ROM drives where you are mounting CD-ROMs
  - Any spare disk used to create a CD image
  - Your network interface adapter if you are installing from a RIS server
8. At the console prompt, set the value of the `bootdef_dev` variable to null:

```
>>> set bootdef_dev ""
```
9. At the console prompt, set the value of the `auto_action` variable to `halt`:

```
>>> set auto_action halt
```

10. At the console prompt, set the value of the `boot_osflags` variable to a:

```
>>> set boot_osflags a
```

11. Power down your system.
12. Review your hardware documentation and install your new hardware.

---

#### Note

---

If you add supported hardware after NHD-7 is already installed on your system, follow the instructions in Section 5.2.5 to include support for the new hardware in your custom kernel on either the single system or the cluster member where you install the new hardware.

---

13. Power up your system.
14. Install NHD-7 according to the instructions in Section 5.2.

---

#### Caution

---

Before you install NHD-7 onto a system that includes SA5300A series RAID controllers, see the release notes in Section 3.5. Failure to follow these instructions can cause your NHD-7 installation to fail.

---

## 5.1.2 Creating an NHD-7 Kit CD Image

If you downloaded an NHD-7 kit from the Web, you must first create a CD image of the kit on disk. (See Section 1.2 for information about downloading a kit.)

The following steps assume that you have downloaded the NHD-7 kit to `/usr/tmp` and that you have a spare disk with at least 750 MB of free space to use for the CD image.

---

#### Note

---

This procedure creates a CD image of the NHD-7 kit distribution for installation purposes. It does not allow you to burn a CD-ROM from this image.

---

1. Log in as `root`.
2. Select a disk of at least 750 MB that is empty or can be overwritten. In this example, this disk will be referred to as `dskX`.
3. Use the `disklabel -e` command to make the `a` partition on `/dev/disk/dskXc` the same size as the `c` partition.
4. Create a new UFS file system on the spare disk. For example:

```
newfs /dev/rdisk/dsk2c
```

You will see output similar to this:

```
Warning: /dev/rdisk/dsk2c and overlapping partition(s) are marked in use.
If you continue with the operation you can
possibly destroy existing data.
CONTINUE? [y/n]
```

5. Enter **y** to continue. You will see output similar to this:

```
/dev/rdisk/dsk2c: 8380080 sectors in 3708 cylinders of 20 tracks, \
 113 sectors
4091.8MB in 232 cyl groups (16 c/g, 17.66MB/g, 4288 i/g)
```

```
super-block backups (for fsck -b #) at:
32, 36320, 72608, 108896, 145184, 181472, 217760, 252048,
290336, 326624, 362912, 399200, 435488, 471776, 508064, 544352,
:
```

```
7813664, 7849952, 7886240, 7922528, 7958816, 7995104, 8031392, 8067680,
8099872, 8136160, 8172448, 8208736, 8245024, 8281312, 8317600, 8353888,
```

6. Mount a new file system. For example:

```
mount /dev/disk/dskXc /mnt
```

7. Change directory to the new file system:

```
cd /mnt
```

8. Enter the following command to extract the NHD-7 kit into the CD image:

```
gzcat /usr/tmp/NHD7_REV_X7.1.tar.gz | tar xvf -
```

You will see a list of files as they are extracted.

9. Return to the root directory and unmount the CD image:

```
cd /
umount /mnt
```

You have created an NHD-7 CD image on the disk at `/dev/disk/dskXc`.

### 5.1.3 Preparing for a RIS installation

If you are installing NHD-7 from a RIS server, you first must do the following:

1. Set up the RIS area on the RIS server (Section 4.1.3.1).
2. Register the RIS client (Section 4.1.3.2).

---

#### Note

Although the examples in this section show the NHD-7 distribution on CD-ROM, you can use a CD image created from the downloaded NHD-7 kit, as described in Section 5.1.2.

---

See the *Sharing Software on a Local Area Network* manual for more information about RIS. The Troubleshooting RIS chapter is especially helpful if you encounter difficulties.

#### 5.1.3.1 Setting Up the RIS Area

Follow these steps to create a RIS area for NHD-7 on your RIS server:

1. Use the `ris` utility to install Version 5.1A of the base operating system into a new RIS area.

---

#### Caution

Use the standard method to create the RIS area, not the bootlink method.

Extract the base operating system; do not use symbolic links.

---

Optionally, you can install TruCluster Server and Worldwide Language Support in the same RIS area.

2. Load the NHD-7 CD-ROM into the RIS server's CD-ROM drive.
3. Mount the NHD-7 distribution. For example:

```
mount /dev/disk/cdrom0a /mnt
```

4. Run the `update_ris` script to install the NHD-7 kit into the RIS area. For example:

```
/mnt/tools/update_ris
```

You will see messages similar to the following:

```
Please select one of the following products to add NHD support to
```

```
1) /usr/var/adm/ris/ris9.alpha
'Tru64 UNIX V5.1x Operating System (Rev nnnn) '

2) /usr/var/adm/ris/ris6.alpha
'Tru64 UNIX V5.1x Operating System (Rev nnnn) '
```

```
Enter your selection or press <return> to quit:
```

---

### Note

---

The RIS areas you see depend upon your RIS server.

---

5. In this example, enter **2** and press Return. You will see messages similar to the following:

```
You are updating ris area /usr/var/adm/ris/ris6.alpha for:
V5.1x Operating System (Rev 1885)
with NHD support.
Is this correct? (y/n):
```

6. In this example, enter **y** and press Return. You will see messages similar to the following:

```
'Tru64 UNIX New Hardware for V5.1x'
1 'Tru64 UNIX New Hardware for V5.1x'
Building new network bootable kernel
/usr/var/adm/ris/ris6.alpha/kit has been updated with NHD-7 support
```

### 5.1.3.2 Registering the RIS Client

See the *Sharing Software on a Local Area Network* manual for instructions on how to register RIS clients for a RIS area.

---

### Note

---

When you register a cluster as a RIS client, remember to register both the cluster alias and the lead cluster member. During client registration, you see the following prompt:

```
Is this client a cluster alias? (y/n) [n]:
```

- When you register a cluster alias, enter **y** and press Return.
  - When you register the lead cluster member, press Return. When prompted, enter the hardware address.
- 

## 5.2 Installing the NHD-7 Kit

This section tells you how to install the NHD-7 kit on a system in one of the following configurations:

- Single system already running Version 5.1A (Section 5.2.1)
- Single system during Full Installation of Version 5.1A:
  - Installing from a CD-ROM or CD image ()
  - Installing from RIS ()

- Cluster already running Version 5.1A (Section 5.2.3)
- Cluster during Full Installation of Version 5.1A (Section 5.2.4)

---

**Note**

---

You can install NHD-7 from CD-ROM or from a CD image that you create from the downloaded kit.

If you are installing NHD-7 during a Full Installation, you can install from a RIS area.

---

## 5.2.1 Installing on a Single System Running Version 5.1A

Before you start this procedure, you must have the NHD-7 distribution. See Section 1.2 for information about how to get the NHD-7 kit. See Section 5.1.2 on how to create an NHD-7 kit CD image for kits downloaded from the Web.

---

**Note**

---

You cannot use RIS to install NHD-7 on a single system running Version 5.1A

---



---

**Caution**

---

Before you install NHD-7 onto a system that includes SA5300A series RAID controllers, see the release notes in Section 3.5. Failure to follow these instructions can cause your NHD-7 installation to fail.

---

Follow these steps to install NHD-7 on a single system that already is running Version 5.1A of the Tru64 UNIX operating system:

1. Log in as `root`.
2. Mount the NHD-7 CD-ROM or the CD image you created in Section 4.1.2. For example:

```
mount /dev/disk/cdrom0a /mnt
```

or

```
mount /dev/disk/dskXc /mnt
```

3. Change directory to the mounted NHD-7 kit. For example:

```
cd /mnt
```

4. Run the `nhd_install` script:

```
./nhd_install
```

You will see output similar to the following:

```
Using kit at /mnt/520
```

```
"Would you like to install the V5.1x Tru64 Unix Patches: (y/n)
```

5. Answer **y** and press Return. You will see a list of the patches as they are installed, followed by output similar to the following:

```
Checking file system space required to install specified subsets:
```

```
File system space checked OK.
```

```
1 subsets will be installed.
```

```

Loading subset 1 of 1 ...

New Hardware Base System Support V7.0
 Copying from /mnt/520/kit (disk)
 Working....Mon Jul 21 13:59:55 EDT 2003

 Verifying

1 of 1 subsets installed successfully.

Configuring "New Hardware Base System Support V7.0" (OSHHWBASE520)

Rebuilding the /GENERIC file to include the kernel modules for the
new hardware. This may take a few minutes.

Successful setting of the new version identifier
Successful switch of the version identifiers

```

- At the shell prompt, shut down the system:

```
shutdown -h now
```

- At the console prompt, boot the generic kernel. For example:

```
>>> boot -fi genvmunix dqb0
```

- After the system boots, log in as root.

- At the shell prompt, use the doconfig utility to rebuild the custom kernel:

```
doconfig
```

You will see messages similar to the following:

```

*** KERNEL CONFIGURATION AND BUILD PROCEDURE ***

Enter a name for the kernel configuration file. [SYSNAME]:

A configuration file with the name 'SYSNAME' already exists.
Do you want to replace it? (y/n) [n]:

```

- Enter **y** and press Return. You will see messages similar to the following:

```

Saving /sys/conf/SYSNAME as /sys/conf/SYSNAME.bck

*** KERNEL OPTION SELECTION ***

Selection Kernel Option

1 System V Devices
2 NTP V3 Kernel Phase Lock Loop (NTP_TIME)
3 Kernel Breakpoint Debugger (KDEBUG)
4 Packetfilter driver (PACKETFILTER)
5 IP-in-IP Tunneling (IPTUNNEL)
6 IP Version 6 (IPV6)
7 Point-to-Point Protocol (PPP)
8 STREAMS pckt module (PCKT)
9 X/Open Transport Interface (XTISO, TIMOD, TIRDWR)
10 Digital Versatile Disk File System (DVDFS)
11 ISO 9660 Compact Disc File System (CDFS)
12 Audit Subsystem
13 ATM UNI 3.0/3.1 ILMI (ATMILMI3X)
14 IP Switching over ATM (ATMIFMP)
15 LAN Emulation over ATM (LANE)
16 Classical IP over ATM (ATMIP)
17 ATM UNI 3.0/3.1 Signalling for SVCs (UNI3X)
18 Asynchronous Transfer Mode (ATM)
19 All of the above
20 None of the above
21 Help
22 Display all options again

```

Enter your choices.

```
Choices (for example, 1 2 4-6) [20]:
```

- Select the kernel options you want built into your new custom kernel. Include the same options you were already running on your system. For example, if you want to select all listed kernel options, enter **19** and press Return.

You will see messages similar to the following:

```

You selected the following kernel options:
System V Devices
NTP V3 Kernel Phase Lock Loop (NTP_TIME)
Kernel Breakpoint Debugger (KDEEBUG)
Packetfilter driver (PACKETFILTER)
IP-in-IP Tunneling (IPTUNNEL)
IP Version 6 (IPV6)
Point-to-Point Protocol (PPP)
STREAMS pckt module (PCKT)
X/Open Transport Interface (XTISO, TIMOD, TIRDWR)
Digital Versatile Disk File System (DVDFS)
ISO 9660 Compact Disc File System (CDFS)
Audit Subsystem
ATM UNI 3.0/3.1 ILMI (ATMILMI3X)
IP Switching over ATM (ATMIFMP)
LAN Emulation over ATM (LANE)
Classical IP over ATM (ATMIP)
ATM UNI 3.0/3.1 Signalling for SVCs (UNI3X)
Asynchronous Transfer Mode (ATM)

```

Is that correct? (y/n) [y]:

12. Press Return to confirm your selection. You will see the following prompt:

```
Do you want to edit the configuration file? (y/n) [n]:
```

13. Press Return. You will see messages similar to the following:

```

*** PERFORMING KERNEL BUILD ***

A log file listing special device files is located in /dev/MAKEDEV.log
Working...Thu Jun 20 14:59:36 EDT 2003
Working...Thu Jun 20 15:01:53 EDT 2003
Working...Thu Jun 20 15:05:32 EDT 2003

The new kernel is /sys/SYSNAME/vmunix

```

14. Copy the new custom kernel to /vmunix. For example:

```
cp /sys/SYSNAME/vmunix /vmunix
```

15. Shut down the system:

```
shutdown -h now
```

16. At the console prompt, boot the system with the new custom kernel. For example:

```
>>> boot -fi "vmunix" dqb0
```

## 5.2.2 Installing on a Single System During a Full Installation of Version 5.1A

You can install NHD-7 on a single system during a Full Installation of the operating system from either of the following sources:

- NHD-7 kit on CD-ROM or on a CD image that you created from the downloaded kit ()
- NHD-7 kit in a RIS area along with the base operating system. ()

See Section 1.2 for information on getting the NHD kit, creating a CD image, and setting up a RIS area.

---

### Caution

---

Before you install NHD-7 onto a system that includes SA5300A series RAID controllers, see the release notes in Section 3.5. Failure to follow these instructions can cause your NHD-7 installation to fail.

---

### 5.2.2.1 Installing from a CD-ROM or CD Image

Before you start this procedure, see the *Installation Guide* for information about the Full Installation process. You must have both the NHD-7 kit and the Tru64 UNIX Operating System distribution. See Section 1.2 for information about how to get the NHD-7 kit and, if necessary, create an NHD-7 kit CD image.

This process requires multiple CD-ROM swaps, which are documented in the directions that follow. The disk swaps are required because the addition and deletion of some global symbols in the operating system requires that some of the updated kernel `.mod` files contained in the NHD kit are boot linked in a specific order relative to the `.mod` files that are used from the Version 5.1A installation CD-ROMs.

You will be prompted in one of the following ways when the CD-ROM needs to be swapped:

- Insert media for kit `'dqa0:/520/usr/sys/hardware/base.kit'`  
This prompt means that the NHD CD-ROM must be in the CD drive.
- Insert boot media, hit `<return>` when ready:  
This prompt means that the operating system CD must be in the CD drive.

The following steps describe what you must do if you use two CD-ROMs and one CD drive. If you are using two CD drives or a CD image, adjust these steps as follows:

- If you are using multiple CD drives, you can place the NHD CD-ROM in one drive and the operating system installation CD-ROM in the other and will not have to swap CDs. When prompted for the “media for kit,” specify the console name of the CD drive containing the NHD CD-ROM. When prompted for the “boot media,” specify the console name of the drive containing the operating system CD-ROM.
- If you created a CD image of the NHD kit, you can place the operating system installation CD-ROM in the CD drive. When prompted for the “media for kit,” specify the console name of the disk containing the NHD CD-ROM. When prompted for the “boot media,” specify the console name of the drive containing the operating system CD-ROM.

1. If your system already is running a version of the operating system, log in as `root` and shut down the system.
2. Insert the Version 5.1A installation media in the CD drive. For the following steps, the drive is assumed to be `dqb0`.
3. At the console prompt, type the following:

```
>>> set bootdef_dev ""
```

4. At the console prompt, boot the generic kernel. For example:

```
>>> boot -fl fa -fi "GENERIC" dqb0
```

You will see messages similar to the following:

```
(boot dqb0.0.1.16.0 -file GENERIC -flags fa)
block 0 of dqb0.0.1.16.0 is a valid boot block
reading 15 blocks from dqb0.0.1.16.0
bootstrap code read in
base = 200000, image_start = 0, image_bytes = 1e00
initializing HWRPB at 2000
initializing page table at 3ff48000
initializing machine state
setting affinity to the primary CPU
jumping to bootstrap code
```



UNIX boot - Wednesday, August 01, 2001

Loading GENERIC ...  
Loading at fffffc0000250000

Enter all Foreign Hardware Kit Names.  
Device Names are entered as console names (e.g. dkb100).

Enter Device Name, or <return> if done:

---

**Note**

---

The message to enter foreign kit names starts the phase of the process where you specify kits and their locations. Do not enter a kit name here. Look at the actual prompt and enter the device name where the NHD-7 kit is located.

---

5. Enter the console device name of the CD-ROM drive at the prompt and press Return:

Enter Device Name, or <return> if done: **dqb0** **Return**

You will see a prompt similar to the following:

Enter Hardware Kit Name, or <return> if done with dqb0:

6. Enter the NHD-7 kit name and press Return:

**/520/usr/sys/hardware/base.kit** **Return**

You will see a prompt similar to the following:

Insert media for kit 'dqb0:/520/usr/sys/hardware/base.kit'  
hit <return> when ready, or 'q' to quit this kit:

7. Remove the Tru64 UNIX Operating System CD-ROM, load the New Hardware Delivery CD-ROM, and press Return.

8. Press Return at each of the following prompts you see:

Enter Hardware Kit Name, or <return> if done with dqa0: **Return**

Enter Device Name, or <return> if done: **Return**

You then see a prompt similar to the following:

Insert boot media, hit <return> when ready:

9. Remove the New Hardware Delivery CD-ROM, load the Tru64 UNIX Operating System CD-ROM, and press Return. You will see messages similar to the following:

Linking 198 objects: 198  
Insert media for kit 'dqb0:/520/usr/sys/hardware/base.kit'

10. Remove the Tru64 UNIX Operating System CD-ROM, load the New Hardware Delivery CD-ROM, and press Return. You will see messages similar to the following:

197  
Insert boot media, hit <Return> when ready:

11. Remove the New Hardware Delivery CD-ROM, load the Tru64 UNIX Operating System CD-ROM, and press Return. You will see messages similar to the following:

196 195 194 193 192 191 190 189 188  
Insert media for kit 'dqb0:/520/usr/sys/hardware/base.kit'  
hit <Return> when ready or 'q' to quit:

12. Remove the Tru64 UNIX Operating System CD-ROM, load the New Hardware Delivery CD-ROM, and press Return. You will see messages similar to the following:

```
187
Insert boot media, hit <Return> when ready:
```

13. Remove the New Hardware Delivery CD-ROM, load the Tru64 UNIX Operating System CD-ROM, and press Return. You will see messages similar to the following:

```
186 185 184 183 182 181 180 179 178
Insert media for kit 'dqb0:/520/usr/sys/hardware/base.kit'
hit <Return> when ready or 'q' to quit:
```

14. Remove the Tru64 UNIX Operating System CD-ROM, load the New Hardware Delivery CD-ROM, and press Return. You will see messages similar to the following:

```
177
Insert boot media, hit <Return> when ready:
```

15. Remove the New Hardware Delivery CD-ROM, load the Tru64 UNIX Operating System CD-ROM, and press Return. You will see messages similar to the following:

```
176 175 174 173 172 171 170 169 168 167 166 165 164 163 162 161 160 159 158 157
156 155 154 153 152 151 150 149 148 147 146 145 144 143 142 141 140 139 138 137
```

:

```
68 67 66 65 64 63 62 61 60 59 58 57 56 55 54 53 52 51 50 49 48 47 46 45 44 43
Insert media for kit 'dqb0:/520/usr/sys/hardware/base.kit'
hit <Return> when ready or 'q' to quit:
```

16. Remove the Tru64 UNIX Operating System CD-ROM, load the New Hardware Delivery CD-ROM, and press Return. You will see messages similar to the following:

```
42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16
15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
Insert boot media, hit <Return> when ready:
```

17. Remove the New Hardware Delivery CD-ROM, load the Tru64 UNIX Operating System CD-ROM, and press Return. You will see messages similar to the following:

```
Sizes:
text = 8359680
data = 2151232
bss = 2433568
Starting at 0xfffffc0000262430
```

18. You will see the Tru64 UNIX installation screens. Enter host information, select subsets and target disks, and continue the Full Installation process as described in the *Installation Guide*.

After the final reboot, the Full Installation process configures the system and reboots the system.

You will see messages similar to the following:

```
UNIX boot - Wednesday, August 01, 2003
```

```
Loading /GENERIC ...
Loading at fffffc0000250000
```

```
Enter all Foreign Hardware Kit Names.
Device Names are entered as console names (e.g. dkb100).
```

Enter Device Name, or <return> if done:

19. Enter the console device name for the NHD-7 kit, for example: **dqb0**. You will see the following prompt:

Enter Hardware Kit Name, or <return> if done with dqb0:

20. Enter the NHD-7 kit name:

```
/520/usr/sys/hardware/base.kit
```

You will see a prompt similar to the following:

```
Insert media for kit 'dqb0:/520/usr/sys/hardware/base.kit'
hit <return> when ready, or 'q' to quit this kit:
```

21. Remove the Tru64 UNIX Operating System CD-ROM, load the New Hardware Delivery CD-ROM, and press Return. (You will not have to change media again.)

22. Press Return. You will see a prompt similar to the following:

Enter Hardware Kit Name, or <return> if done with dqb0:

23. Because there are no other kits included in NHD-7, press Return. You will see the following prompt:

Enter Device Name, or <return> if done:

24. Again, because there are no other kits to install, press Return. You will see the following prompt:

Insert boot media, hit <return> when ready:

---

**Note**

---

Although this prompt asks you to insert the boot media, do not insert the Tru64 UNIX Operating System CD-ROM. At this point in the installation process you are booting from the system disk, and no media change is necessary.

---

25. Press Return. You will see a prompt similar to the following:

```
Linking 198 objects: 198
```

```
:
```

```
Insert media for kit 'dka400:/520/usr/sys/hardware/base.kit'
hit <return> when ready or 'q' to quit:
```

26. Press Return. You will see messages similar to the following:

```
197
```

```
Insert boot media, hit <return> when ready:
```

---

**Note**

---

Although this prompt asks you to insert the boot media, do not insert the Tru64 UNIX Operating System CD-ROM. At this point in the installation process you are booting from the system disk, and no media change is necessary.

---

27. Press Return. You will see messages similar to the following:

```
196 195 194 193 192 191 190 189 188
```

```
Insert media for kit 'dqa0:/520/usr/sys/hardware/base.kit'
hit <Return> when ready or 'q' to quit:
```

28. Press Return. You will see messages similar to the following:

```
187
Insert boot media, hit <Return> when ready:
```

29. Press Return. You will see messages similar to the following:

```
186 185 184 183 182 181 180 179 178
Insert media for kit 'dqa0:/520/usr/sys/hardware/base.kit'
hit <Return> when ready or 'q' to quit:
```

30. Press Return. You will see messages similar to the following:

```
177
Insert boot media, hit <Return> when ready:
```

31. Press Return. You will see messages similar to the following:

```
176 175 174 173 172 171 170 169 168 167 166 165 164 163 162 161 160 159 158 157
:
68 67 66 65 64 63 62 61 60 59 58 57 56 55 54 53 52 51 50 49 48 47 46 45 44 43
Insert media for kit 'dqb0:/520/usr/sys/hardware/base.kit'
hit <Return> when ready or 'q' to quit:
```

32. Press Return. You will see messages similar to the following:

```
Insert boot media, hit <Return> when ready:
```

```
Sizes:
text = 8359680
data = 2151232
bss = 2433568
Starting at 0xfffffc0000262430
```

You will now see common system configuration messages and the installation of the NHD-7 and Version 5.1A patch kit. When the system boots one more time, the installation is complete.

33. Log in as `root` and configure your system from the System Setup Checklist. See the System Setup Checklist online help for more information.

### 5.2.2.2 Installing from RIS

Before you start this procedure, see the *Installation Guide* for information about the Full Installation process. You must have both the NHD-7 kit and the Tru64 UNIX Operating System distribution. See Section 1.2 for information about how to get the NHD-7 kit and how to prepare for RIS installation.

1. If your system already is running a version of the operating system, log in as `root` and shut down the system.
2. At the console prompt, type the following:

```
>>> set bootdef_dev ""
```

3. At the console prompt, boot from the RIS server. For example:

```
>>> boot ewa0
```

You will see the operating system boot and the Full Installation user interface start.

4. Enter host information, select subsets and target disks, and continue the Full Installation process as described in the *Installation Guide*.

The following list describes differences you may see when you install NHD-7 from a RIS server:

- You may see the installation of the Version 5.1A Patch Kit before the kernel build.

- After the base operating system subsets are installed, you see the New Hardware Base System Support V7.0 subset installed from the RIS server.
- During system configuration, you may see messages similar to the following as NHD-7 is configured and the generic kernel is rebuilt:

```
Configuring "New Hardware Base System Support V7.0" (OSHHWBASE520)

Rebuilding the /GENERIC file to include the kernel modules for the
new hardware. This may take a few minutes.
```

5. You will see messages similar to the following as the kernel is rebuilt before the final reboot:

```
The system name assigned to your machine is 'sysname'.
*** KERNEL CONFIGURATION AND BUILD PROCEDURE ***
```

```
The system will now automatically build a kernel
with all options and then reboot. This can take
up to 15 minutes, depending on the processor type.
```

```
When the login prompt appears after the system
has rebooted, use 'root' as the login name and
the SUPERUSER password that was entered during
this procedure, to log into the system.
```

```
*** PERFORMING KERNEL BUILD ***
Working...Thu Jun 20 14:06:34 EDT 2003
```

```
The new version ID has been successfully set on this system.
The entire set of new functionality has been enabled.
```

```
This message is contained in the file /var/adm/smlogs/it.log for
future reference.syncing disks... done
rebooting.... (transferring to monitor)
```

The system reboots with the custom kernel, and you see the login prompt.

6. Log in as `root` and configure your system from the System Setup Checklist. See the System Setup Checklist online help for more information.

### 5.2.3 Installing on a Cluster Running Version 5.1A

Before you install NHD-7 on an existing cluster, see the Rolling Upgrade chapter in the TruCluster Server *Cluster Installation* manual. You must have the NHD-7 kit distribution, the Tru64 UNIX Operating System CD-ROM, and the Associated Products, Volume 2, CD-ROM, which includes the TruCluster Server software. See Section 1.2 for information about how to get the NHD-7 kit and, if necessary, create an NHD-7 kit CD image or prepare for RIS installation.

---

#### Caution

---

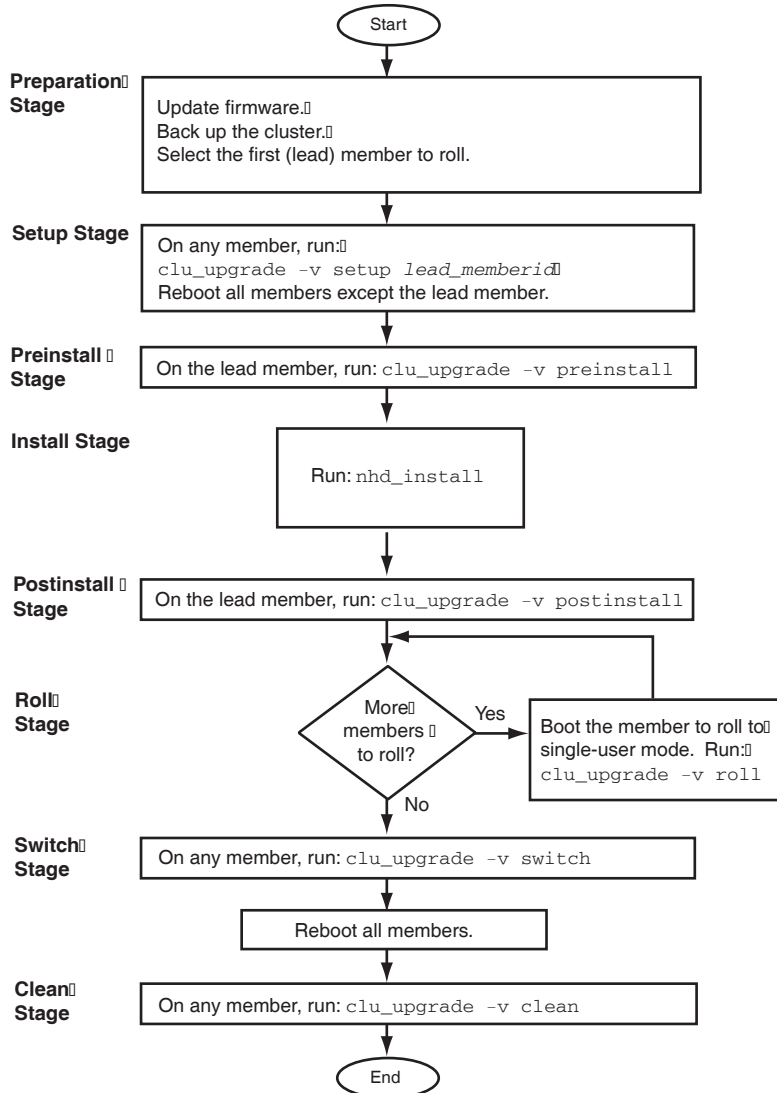
Before you install NHD-7 onto a system that includes SA5300A series RAID controllers, see the release notes in Section 3.5. Failure to follow these instructions can cause your NHD-7 installation to fail.

---

Perform a Rolling Upgrade as described in the following sections to install NHD-7 on an existing cluster. See the *clu\_upgrade Quick Reference Best Practice* and the Rolling Upgrade chapter in the TruCluster Server *Cluster Installation* manual for more information.

Figure 5-1 shows a simplified flow chart of the tasks and stages that are part of an NHD Rolling Upgrade.

**Figure 5-1: NHD Rolling Upgrade**



ZK-1870U-AI

### 5.2.3.1 Preparation Stage

Perform the tasks in the Rolling Upgrade Preparation Stage. See the Rolling Upgrade chapter in the TruCluster Server *Cluster Installation* manual for more information.

### 5.2.3.2 Setup Stage

Perform the following steps in the Setup Stage:

1. Use the `clu_upgrade` command to start the Setup Stage. For example, if the lead member has member ID 1:

```
clu_upgrade -v setup 1
```

You will see the following messages:

```
Retrieving cluster upgrade status.
```

```
This is the cluster upgrade program.
```

```
You have indicated that you want to perform the 'setup' stage of the upgrade.
```

```
Do you want to continue to upgrade the cluster? [yes]:
```

2. Press Return. You will see the following messages:

```
What type of rolling upgrade will be performed?

 Selection Type of Upgrade

 1 An upgrade using the installupdate command
 2 A patch using the dupatch command
 3 A new hardware delivery using the nhd_install command
 4 All of the above
 5 None of the above
 6 Help
 7 Display all options again

Enter your Choices (for example, 1 2 2-3):
```

3. Enter **2 3** and press Return. You will see the following messages:

```
You selected the following rolling upgrade options: 2 3
Is that correct? (y/n) [y]:
```

4. Enter **y** and press Return. You will see the following messages:

```
Enter the full pathname of the patch kit kit mount point ['???']:
```

5. Enter the NHD kit mount point, **/mnt/520/Tru64UNIX\_Patches**, and press Return. You will see the following messages:

```
A patch kit has been found in the following location:

/mnt/nnn/Tru64UNIX_Patches

This kit has the following version information:

'Tru64 UNIX V5.1x Patch Distribution'
(T64V51BB24AS0003-20030627PatchTools520,27-Jun-2003:16:04:41)'

Is this the correct nhd kit for the update being performed? [yes]:
```

6. Press Return. You will see the following message:

```
Enter the full pathname of the nhd kit mount point ['???']:
```

7. Enter the NHD kit mount point, **/mnt**, and press Return. You will see the following messages:

```
A nhd kit has been found in the following location:

/mnt

This kit has the following version information:

'Tru64 UNIX New Hardware for V5.1x'

Is this the correct nhd kit for the update being performed? [yes]:
```

8. Enter **yes** and press Return . You will see the following messages:

```
Checking inventory and available disk space.
Marking stage 'setup' as 'started'.
Copying NHD kit '/mnt' to '/var/adm/update/NHDKit/'.
nhd_install -copy 520 /var/adm/update/NHDKit/

Creating tagged files.
.....
The cluster upgrade 'setup' stage has completed successfully.
Reboot all cluster members except member: '1'
Marking stage 'setup' as 'completed'.

The 'setup' stage of the upgrade has completed successfully.
```

---

**Note**

---

You may see the following message during this step:

```
clubase: Entry not found in /cluster/admin/tmp/stanza.stdin.530756
```

This is a known error and can be ignored.

---

9. Reboot all your cluster members except the lead member. See the Rolling Upgrade chapter in the TruCluster Server *Cluster Installation* manual for more information.

### 5.2.3.3 Preinstall Stage

Perform the following steps in the Preinstall Stage:

1. Use the `clu_upgrade` command to start the Preinstall Stage:

```
clu_upgrade -v preinstall
```

You will see the following messages:

```
Retrieving cluster upgrade status.
```

```
This is the cluster upgrade program.
You have indicated that you want to perform the 'preinstall' stage of the
upgrade.
```

```
Do you want to continue to upgrade the cluster? [yes]:
```

2. Enter **yes** and press Return . You will see the following messages:

```
clu_upgrade has previously created the required tagged files and would
normally check and repair any tagged files which may have been modified
since they were created. If you feel that the tagged files have not changed
since they were created you may bypass these checks and continue with the
rolling upgrade.
```

```
Do you wish to skip tag file checking? [no]:
```

3. If the Preinstall Stage is performed immediately after the Setup Stage, you can skip tagged file checking. If time has elapsed between the Setup Stage and Preinstall Stage, you may want to check the tagged files. The prompt asks if you want to skip tagged file checking.

- If you want to check tagged files, enter **no** at the prompt and press Return. You will see the following message, followed by a progress indicator and by informational messages about the end of the preinstall stage:

```
Checking tagged files.
.....
```

- If you want to skip tagged file checking, enter **yes** and press Return. You will see informational messages about the end of the preinstall stage:

```
Marking stage 'preinstall' as 'started'.
```

```
Backing up member-specific data for member: 1
```

```
Marking stage 'preinstall' as 'completed'.
The cluster upgrade 'preinstall' stage has completed successfully.
You can now run the nhd_install command on the lead member.
```

```
The 'preinstall' stage of the upgrade has completed successfully.
```

---

#### Note

---

If you see the following message you can ignore it.

```
. find: bad starting directory
```

This is a known error and can be ignored.

---

### 5.2.3.4 Install Stage

Perform the following steps in the Install Stage:

1. Make sure that the NHD-7 distribution is still mounted.



2. Change directory to the mounted NHD-7 kit. For example:

```
cd /mnt
```

3. Use the `nhd_install` script to install the NHD-7 kit on the lead member:

```
./nhd_install
```

4. Answer yes to the following question and press Return:

```
NHD installation also requires installing patches
Would you like to install the NHD Kit, Tru64_UNIX_V5.1A and
TruCluster_V5.1A Patches: (y/n) [y]: y Return
```

5. At the shell prompt, shut down the system:

```
shutdown -h now
```

6. At the console prompt, boot the generic kernel. For example:

```
>>> boot -fi genvmunix dqb0
```

7. After the system boots, log in as `root`.

8. At the shell prompt, use the `doconfig` utility to rebuild the custom kernel:

```
doconfig
```

You will see messages similar to the following:

```
*** KERNEL CONFIGURATION AND BUILD PROCEDURE ***

Enter a name for the kernel configuration file. [SYSNAME]:
```

9. Press Return to accept the default. You will see messages similar to the following:

```
A configuration file with the name 'SYSNAME' already exists.
Do you want to replace it? (y/n) [n]:
```

10. Enter **y** and press Return. You will see messages similar to the following:

```
Saving /sys/conf/SYSNAME as /sys/conf/SYSNAME.bck
```

```
*** KERNEL OPTION SELECTION ***
```

```
Selection Kernel Option

1 System V Devices
2 NTP V3 Kernel Phase Lock Loop (NTP_TIME)
3 Kernel Breakpoint Debugger (KDEBUG)
4 Packetfilter driver (PACKETFILTER)
5 IP-in-IP Tunneling (IPTUNNEL)
6 IP Version 6 (IPV6)
7 Point-to-Point Protocol (PPP)
8 STREAMS pckt module (PCKT)
9 X/Open Transport Interface (XTISO, TIMOD, TIRDWR)
10 Digital Versatile Disk File System (DVDFS)
11 ISO 9660 Compact Disc File System (CDFS)
12 Audit Subsystem
13 ATM UNI 3.0/3.1 ILMI (ATMILMI3X)
14 IP Switching over ATM (ATMIFMP)
15 LAN Emulation over ATM (LANE)
16 Classical IP over ATM (ATMIP)
17 ATM UNI 3.0/3.1 Signalling for SVCs (UNI3X)
18 Asynchronous Transfer Mode (ATM)
19 All of the above
20 None of the above
21 Help
22 Display all options again

```

```
Enter your choices.
```

```
Choices (for example, 1 2 4-6) [20]:
```

11. Select the kernel options you want built into your new custom kernel. Include the same options you were already running on your system. In this example, if you want to select all listed kernel options, enter **19** and press Return.

You will see messages similar to the following:

```

You selected the following kernel options:
System V Devices
NTP V3 Kernel Phase Lock Loop (NTP_TIME)
Kernel Breakpoint Debugger (KDEEBUG)
Packetfilter driver (PACKETFILTER)
IP-in-IP Tunneling (IPTUNNEL)
IP Version 6 (IPV6)
Point-to-Point Protocol (PPP)
STREAMS pckt module (PCKT)
X/Open Transport Interface (XTISO, TIMOD, TIRDWR)
Digital Versatile Disk File System (DVDFS)
ISO 9660 Compact Disc File System (CDFS)
Audit Subsystem
ATM UNI 3.0/3.1 ILMI (ATMILMI3X)
IP Switching over ATM (ATMIFMP)
LAN Emulation over ATM (LANE)
Classical IP over ATM (ATMIP)
ATM UNI 3.0/3.1 Signalling for SVCs (UNI3X)
Asynchronous Transfer Mode (ATM)

```

Is that correct? (y/n) [y]:

- Enter **y** to confirm your selection and press Return. You will see the following prompt:

```
Do you want to edit the configuration file? (y/n) [n]:
```

- Enter **n** and press Return. You will see messages similar to the following:

```

*** PERFORMING KERNEL BUILD ***

A log file listing special device files is located in /dev/MAKEDEV.log
Working...Thu Jun 20 14:59:36 EDT 2003
Working...Thu Jun 20 15:01:53 EDT 2003
Working...Thu Jun 20 15:05:32 EDT 2003

The new kernel is /sys/SYSNAME/vmunix

```

- Copy the new custom kernel to the member-specific directory on the lead member. For example:

```
cp /sys/SYSNAME/vmunix /cluster/members/memberN/boot_partition
```

- Shut down the lead member:

```
shutdown -h now
```

- At the console prompt, boot the lead member with the new custom kernel. For example:

```
>>> boot -fi "vmunix" dqb0
```

- Log in as `root` on the lead member.

- Use the `clu_upgrade` command to check the installation status:

```
clu_upgrade -v
```

You will see messages similar to the following:

```

Retrieving cluster upgrade status.
Upgrade Status

Stage Status Date

setup started: Thu Jun 20 16:50:43 EDT 2003
 lead member: 1
 nhd kit source: /mnt
 completed: Thu Jun 20 16:52:34 EDT 2003
preinstall started: Thu Jun 20 16:54:46 EDT 2003
 completed: Thu Jun 20 16:55:16 EDT 2003
nhd started: Thu Jun 20 16:55:57 EDT 2003
 completed: Thu Jun 20 16:57:42 EDT 2003

Member Status Tagged File Status
ID Hostname State Rolled Running with On Next Boot

```

```
1 member01.site.place.net UP Yes No No
```

### 5.2.3.5 Postinstall Stage

Perform the following steps in the Postinstall Stage:

1. On the lead member, use the `clu_upgrade` command to start the Postinstall Stage:

```
clu_upgrade -v postinstall
```

You will see the following messages:

```
Retrieving cluster upgrade status.
```

```
This is the cluster upgrade program.
```

```
You have indicated that you want to perform the 'postinstall' stage of the upgrade.
```

```
Do you want to continue to upgrade the cluster? [yes]:
```

2. Enter **yes** and press Return . You will see the following messages:

```
Marking stage 'postinstall' as 'started'.
```

```
Marking stage 'postinstall' as 'completed'.
```

```
The 'postinstall' stage of the upgrade has completed successfully.
```

3. Use the `clu_upgrade` command to check the installation status:

```
clu_upgrade -v
```

You will see messages similar to the following:

```
Retrieving cluster upgrade status.
```

```
Upgrade Status
```

| Stage       | Status          | Date                         |
|-------------|-----------------|------------------------------|
| setup       | started:        | Thu Jun 20 16:50:43 EDT 2003 |
|             | lead member:    | 1                            |
|             | nhd kit source: | /mnt                         |
|             | completed:      | Thu Jun 20 16:52:34 EDT 2003 |
| preinstall  | started:        | Thu Jun 20 16:54:46 EDT 2003 |
|             | completed:      | Thu Jun 20 16:55:16 EDT 2003 |
| nhd         | started:        | Thu Jun 20 16:55:57 EDT 2003 |
|             | completed:      | Thu Jun 20 16:57:42 EDT 2003 |
| postinstall | started:        | Thu Jun 20 16:58:28 EDT 2003 |
|             | completed:      | Thu Jun 20 16:58:28 EDT 2003 |
| roll        | started:        | Thu Jun 20 16:58:29 EDT 2003 |
|             | members rolled: | 1                            |
|             | completed:      | Thu Jun 20 16:58:29 EDT 2003 |

| ID | Hostname                | Member Status | State  | Tagged File  | Status       |
|----|-------------------------|---------------|--------|--------------|--------------|
|    |                         |               | Rolled | Running with | On Next Boot |
| 1  | member01.site.place.net | UP            | Yes    | No           | No           |
| 10 | member10.site.place.net | UP            | No     | Yes          | Yes          |

### 5.2.3.6 Roll Stage

Before running the Roll Stage, see the Rolling Upgrade chapter in the TruCluster Server *Cluster Installation* manual.

Perform the following steps for each additional cluster member:

1. Log in to the cluster member as `root`.
2. Shut down the cluster member:

```
shutdown -h now
```

3. At the console prompt, boot the cluster member to single-user mode:

```
>>> boot -fl s
```

4. Use the `init s` command to initialize process control:

```
init s
```

5. Use the `bcheckrc` command to mount and check local file systems:

```
bcheckrc
```

You will see output similar to the following:

```
Checking device naming:
 Passed.
CNX QDISK: Successfully claimed quorum disk, adding 1 vote.
Checking local filesystems
Mounting / (root)
user_cfg_pt: reconfigured
root_mounted_rw: reconfigured
Mounting /cluster/members/member57/boot_partition (boot file system)
user_cfg_pt: reconfigured
root_mounted_rw: reconfigured
user_cfg_pt: reconfigured
dsfmgr: NOTE: updating kernel basenames for system at /
 scp kevM tty00 tty01 lp0 dsk3 dsk4 dsk5 dsk6 dsk7 dsk8 floppy1 cdrom1 dmapi
Mounting local filesystems
exec: /sbin/mount_advfs -F 0x14000 cluster_root#root /
cluster_root#root on / type advfs (rw)
exec: /sbin/mount_advfs -F 0x4000 cluster_usr#usr /usr
cluster_usr#usr on /usr: Device busy
exec: /sbin/mount_advfs -F 0x4000 cluster_var#var /var
cluster_var#var on /var: Device busy
/proc on /proc type procfs (rw)
```

6. Use the `lmf reset` command to copy license information into the kernel cache:

```
lmf reset
```

7. Use the `clu_upgrade` command to start the Roll Stage:

```
clu_upgrade -v roll
```

You will see messages similar to the following:

```
This is the cluster upgrade program.
You have indicated that you want to perform the 'roll' stage of the
upgrade.
```

```
Do you want to continue to upgrade the cluster? [yes]:
```

8. Enter **yes** and press Return .

---

### Note

---

You may see the following message during this step:

```
clubase: Entry not found in /cluster/admin/tmp/stanza.stdin.530756
```

This is a known error and can be ignored.

You also may see messages similar to the following:

```
*** Warning ***
The cluster upgrade command was unable to find or verify the configuration
file used to build this member's kernel. clu_upgrade attempts to make a
backup copy of the configuration file which it would restore as required
during a clu_upgrade undo command. To use the default configuration file
or to continue without backing up a configuration file hit return.
Enter the name of the configuration file for this member [SYSNAME]:
```

Press Return to use *SYSNAME* as the configuration file name.

---

You will see messages similar to the following:

```
Backing up member-specific data for member: 10

The 'roll' stage has completed successfully. This
```

member must be rebooted in order to run with the newly installed software.  
Do you want to reboot this member at this time? []:

9. Enter **y** and press Return. You will see the following message:

```
You indicated that you want to reboot this member at this time.
Is that correct? [yes]:
```

10. Enter **y** and press Return. You will see messages similar to the following:

```
The 'roll' stage of the upgrade has completed successfully.
Terminated
syncing disks... done
drd: Clean Shutdown
rebooting.... (transferring to monitor)
```

The cluster member reboots and reconfigures.

11. Use the `clu_upgrade` command to check the installation status:

```
clu_upgrade -v
```

You will see messages similar to the following:

```
Retrieving cluster upgrade status.
Upgrade Status
```

| Stage       | Status                | Date                                      |
|-------------|-----------------------|-------------------------------------------|
| setup       | started:              | Thu Jun 20 16:40:07 EDT 2003              |
|             | lead member:          | 1                                         |
|             | nhd kit source:       | /mnt                                      |
|             | tagged files list:    | /cluster/admin/clu_upgrade/tag_files.list |
|             | tagged files missing: | /cluster/admin/clu_upgrade/tag_files.miss |
|             | completed:            | Thu Jun 20 16:42:48 EDT 2003              |
| preinstall  | started:              | Thu Jun 20 16:51:09 EDT 2003              |
|             | completed:            | Thu Jun 20 16:52:32 EDT 2003              |
| nhd         | started:              | Thu Jun 20 16:54:49 EDT 2003              |
|             | completed:            | Thu Jun 20 16:58:08 EDT 2003              |
| postinstall | started:              | Thu Jun 20 17:18:12 EDT 2003              |
|             | completed:            | Thu Jun 20 17:18:12 EDT 2003              |
| roll        | started:              | Thu Jun 20 17:22:24 EDT 2003              |
|             | members rolled:       | 1 10                                      |
|             | completed:            | Thu Jun 20 17:32:42 EDT 2003              |

| ID | Hostname                | Member Status | State | Rolled | Tagged File Running with | Status On Next Boot |
|----|-------------------------|---------------|-------|--------|--------------------------|---------------------|
| 1  | member01.site.place.net | UP            | Yes   | No     | No                       |                     |
| 10 | member10.site.place.net | UP            | Yes   | No     | No                       |                     |

Repeat this process for each remaining cluster member.

### 5.2.3.7 Switch Stage

Perform the following steps in the Switch Stage:

1. After the Roll Stage is complete, use the `clu_upgrade` command to start the Switch Stage on any cluster member:

```
clu_upgrade -v switch
```

You will see the following messages:

```
Retrieving cluster upgrade status.
```

```
This is the cluster upgrade program.
You have indicated that you want to perform the 'switch' stage of the
upgrade.
```

```
Do you want to continue to upgrade the cluster? [yes]:
```

2. Enter **yes** and press Return . You will see the following messages:

```
Initiating version switch on cluster members
.Marking stage 'switch' as 'started'.
```

```
Switch already switched

Marking stage 'switch' as 'completed'.
The cluster upgrade 'switch' stage has completed successfully.
All cluster members must be rebooted before running the 'clean' command.

The 'switch' stage of the upgrade has completed successfully.
```

3. After you complete the Switch Stage, reboot all cluster members. After each member reboots, you see the login prompt.
4. Log in to the system as `root`.
5. Use the `clu_upgrade` command to check the installation status:

```
clu_upgrade -v
```

You will see messages similar to the following:

```
Retrieving cluster upgrade status.
Upgrade Status

Stage Status Date

setup started: Thu Jun 20 16:40:07 EDT 2003
 lead member: 1
 nhd kit source: /mnt
 tagged files list: /cluster/admin/clu_upgrade/tag_files.list
 tagged files missing: /cluster/admin/clu_upgrade/tag_files.miss
 completed: Thu Jun 20 16:42:48 EDT 2003

preinstall started: Thu Jun 20 16:51:09 EDT 2003
 completed: Thu Jun 20 16:52:32 EDT 2003

nhd started: Thu Jun 20 16:54:49 EDT 2003
 completed: Thu Jun 20 16:58:08 EDT 2003

postinstall started: Thu Jun 20 17:18:12 EDT 2003
 completed: Thu Jun 20 17:18:12 EDT 2003

roll started: Thu Jun 20 17:22:24 EDT 2003
 members rolled: 1 10
 completed: Thu Jun 20 17:32:42 EDT 2003

switch started: Thu Jun 20 16:37:50 EDT 2003
 completed: Thu Jun 20 16:38:20 EDT 2003

Member Status
ID Hostname State Rolled Tagged File Status
Running with On Next Boot

1 member01.site.place.net UP Yes No No
```

### 5.2.3.8 Clean Stage

Perform the following steps in the Clean Stage:

1. After the Switch Stage is complete, use the `clu_upgrade` command to start the Clean Stage on any cluster member:

```
clu_upgrade -v clean
```

You will see the following messages:

```
Retrieving cluster upgrade status.

This is the cluster upgrade program.
You have indicated that you want to perform the 'clean' stage of the
upgrade.

Do you want to continue to upgrade the cluster? [yes]:
```

2. Enter **yes** and press Return . You will see the following messages:

```
.Marking stage 'clean' as 'started'.

Deleting tagged files.
....
```

```
Removing back-up and kit files
Marking stage 'clean' as 'completed'.
The 'clean' stage of the upgrade has completed successfully.
```

3. Use the `clu_upgrade` command to check the installation status:

```
clu_upgrade -v
```

You will see messages similar to the following:

```
Retrieving cluster upgrade status.
There is currently no cluster upgrade in progress.

The last cluster upgrade completed successfully on:
Thu Jun 20 17:05:25 EDT 2003
History for this upgrade can be found in the directory:
 /cluster/admin/clu_upgrade/history/Compaq.Tru64.UNIX.V5.1x.Rev.1885-1
```

## 5.2.4 Installing on a Cluster During a Full Installation of Version 5.1A

Before you start this procedure, see the TruCluster Server *Cluster Installation* manual for information about creating a cluster. You must have the NHD-7 kit distribution, the Version 5.1A Tru64 UNIX Operating System CD-ROM, and the Associated Products, Volume 2, CD-ROM, which includes the Version 5.1A TruCluster Server software.

### Caution

Before you install NHD-7 onto a system that includes SA5300A series RAID controllers, see the release notes in Section 3.5. Failure to follow these instructions can cause your NHD-7 installation to fail.

Follow these steps to install NHD-7 on a new cluster during a Full Installation:

1. Install NHD-7 during a Full Installation on the system that will be the first cluster member, as described in Section 4.2.2.
2. Load the Version 5.1A Associated Products, Volume 2, CD-ROM into the CD-ROM drive.
3. Mount the Associated Products, Volume 2, CD-ROM. For example:

```
mount /dev/disk/cdrom0a /mnt
```

4. Use the `setld -l` command to load the TruCluster Server software:

```
setld -l /mnt/TruCluster/kit
```

You will see output similar to the following:

```
*** Enter subset selections ***

The following subsets are mandatory and will be installed automatically
unless you choose to exit without installing any subsets:

 * TruCluster Base Components

The subsets listed below are optional:

 There may be more optional subsets than can be presented on a single
 screen. If this is the case, you can choose subsets screen by screen
 or all at once on the last screen. All of the choices you make will
 be collected for your confirmation before any subsets are installed.

- TruCluster(TM) Software :
 1) TruCluster Migration Components
 2) TruCluster Reference Pages

Estimated free disk space(MB) in root:269.2 usr:18175.4 var:18665.0

Choices (for example, 1 2 4-6):
```

Or you may choose one of the following options:

- 3) ALL mandatory and all optional subsets
- 4) MANDATORY subsets only
- 5) CANCEL selections and redisplay menus
- 6) EXIT without installing any subsets

Estimated free disk space (MB) in root:269.2 usr:18175.4 var:18665.0

Enter your choices or press RETURN to redisplay menus.

Choices (for example, 1 2 4-6):

5. Enter **3** to select all mandatory and optional subsets. You will see output similar to the following:

You are installing the following mandatory subsets:

TruCluster Base Components

You are installing the following optional subsets:

- TruCluster(TM) Software :
- TruCluster Migration Components
- TruCluster Reference Pages

Estimated free disk space (MB) in root:269.2 usr:18173.6 var:18665.0

Is this correct? (y/n):

6. Enter **y** to confirm your selection. You will see output similar to the following:

Checking file system space required to install selected subsets:

File system space checked OK.

3 subsets will be installed.

Loading subset 1 of 3 ...

TruCluster Migration Components  
Copying from /mnt/TruCluster/kit (disk)  
Verifying

Loading subset 2 of 3 ...

TruCluster Reference Pages  
Copying from /mnt/TruCluster/kit (disk)  
Verifying

Loading subset 3 of 3 ...

TruCluster Base Components  
Copying from /mnt/TruCluster/kit (disk)  
Verifying

3 of 3 subsets installed successfully.

Configuring "TruCluster Migration Components" (TCRMIGRATE520)

Configuring "TruCluster Reference Pages" (TCRMAN520)  
Running : /usr/sbin/mkwhatiss : in the background...

Configuring "TruCluster Base Components" (TCRBASE520)

Use /usr/sbin/clu\_create to create a cluster.

7. Change to the root directory and unmount the Associated Products, Volume 2, CD-ROM:

```
cd /
umount /mnt
```

8. Remove the Associated Products, Volume 2, CD-ROM and load the New Hardware Delivery CD-ROM.

9. Mount the NHD-7 kit. For example:

```
mount /dev/disk/cdrom0a /mnt
```



10. Change directory to the mounted NHD-7 ki:

```
cd /mnt
```

11. Enter the following command to install the NHD cluster kit:

```
./nhd_install
```

---

### Note

---

The `nhd_install` script checks your system before installing the NHD cluster kit. You do not have to use the `-install_cluster` argument.

---

You will see output similar to the following:

```
Checking file system space required to install specified subsets:
```

```
File system space checked OK.
```

```
1 subsets will be installed.
```

```
Loading subset 1 of 1 ...
```

```
New Hardware TruCluster(TM) Support V6.0
```

```
Copying from /mnt/520/kit (disk)
```

```
Working...Thu Jun 20 18:16:41 EDT 2003
```

```
Verifying
```

```
1 of 1 subsets installed successfully.
```

```
Configuring "New Hardware TruCluster(TM) Support V6.0" (OSHTCRBASE520)
```

```
The installation of the New Hardware TruCluster(TM) Support V6.0 (OSHTCRBASE520) software subset is complete.
```

12. After installing the NHD cluster kit, use the `clu_create` command to create a single-member cluster, as described in the *TruCluster Server Cluster Installation* manual.
13. Add additional cluster members as needed. See the *TruCluster Server Cluster Installation* manual for more information.

## 5.2.5 Rebuilding the Kernel After Adding Supported Hardware

The preceding instructions tell you to install the supported hardware before you install the NHD-7 kit. There may be circumstances where you must add supported hardware after NHD-7 is already installed on your system. For example, you may add a Smart Array 5304 RAID controller to an existing AlphaServer DS25 system.

Follow these instructions to include support for the new hardware in your custom kernel on either the single system or the cluster member where you install the new hardware:

1. At the shell prompt, shut down the system:

```
shutdown -h now
```

2. Make sure that the value of the `auto_action` console variable is set to `halt`:

```
>>> set auto_action halt
```

3. Power down the system, install the new hardware, and power up the system.

4. At the console prompt, boot the generic kernel:

```
>>> boot -fi genvmunix dqb0
```

5. After the system boots, log in as `root`.

6. At the shell prompt, use the `doconfig` utility to rebuild the custom kernel:

```
doconfig
```

You will see messages similar to the following:

```
*** KERNEL CONFIGURATION AND BUILD PROCEDURE ***

Enter a name for the kernel configuration file. [SYSNAME]:
```

7. Press Return to accept the default. You will see messages similar to the following:

```
A configuration file with the name 'SYSNAME' already exists.
Do you want to replace it? (y/n) [n]:
```

8. Enter **y** and press Return. You will see messages similar to the following:

```
Saving /sys/conf/SYSNAME as /sys/conf/SYSNAME.bck

*** KERNEL OPTION SELECTION ***

Selection Kernel Option

1 System V Devices
2 NTP V3 Kernel Phase Lock Loop (NTP_TIME)
3 Kernel Breakpoint Debugger (KDEBUG)
4 Packetfilter driver (PACKETFILTER)
5 IP-in-IP Tunneling (IPTUNNEL)
6 IP Version 6 (IPV6)
7 Point-to-Point Protocol (PPP)
8 STREAMS pckt module (PCKT)
9 X/Open Transport Interface (XTISO, TIMOD, TIRDWR)
10 Digital Versatile Disk File System (DVDFS)
11 ISO 9660 Compact Disc File System (CDFS)
12 Audit Subsystem
13 ATM UNI 3.0/3.1 ILMI (ATMILMI3X)
14 IP Switching over ATM (ATMIFMP)
15 LAN Emulation over ATM (LANE)
16 Classical IP over ATM (ATMIP)
17 ATM UNI 3.0/3.1 Signalling for SVCs (UNI3X)
18 Asynchronous Transfer Mode (ATM)
19 All of the above
20 None of the above
21 Help
22 Display all options again

Enter your choices.

Choices (for example, 1 2 4-6) [20]:
```

9. Select the kernel options you want built into your new custom kernel. Include the same options you were already running on your system. In this example, if you want to select all listed kernel options, enter **19** and press Return.

You will see messages similar to the following:

```
You selected the following kernel options:
System V Devices
NTP V3 Kernel Phase Lock Loop (NTP_TIME)
Kernel Breakpoint Debugger (KDEBUG)
Packetfilter driver (PACKETFILTER)
IP-in-IP Tunneling (IPTUNNEL)
IP Version 6 (IPV6)
Point-to-Point Protocol (PPP)
STREAMS pckt module (PCKT)
X/Open Transport Interface (XTISO, TIMOD, TIRDWR)
Digital Versatile Disk File System (DVDFS)
ISO 9660 Compact Disc File System (CDFS)
Audit Subsystem
ATM UNI 3.0/3.1 ILMI (ATMILMI3X)
IP Switching over ATM (ATMIFMP)
LAN Emulation over ATM (LANE)
Classical IP over ATM (ATMIP)
ATM UNI 3.0/3.1 Signalling for SVCs (UNI3X)
Asynchronous Transfer Mode (ATM)

Is that correct? (y/n) [y]:
```

10. Enter **y** to confirm your selection and press Return. You will see the following prompt:

```
Do you want to edit the configuration file? (y/n) [n]:
```

11. Enter **n** and press Return. You will see messages similar to the following:

```
*** PERFORMING KERNEL BUILD ***

A log file listing special device files is located in /dev/MAKEDEV.log
Working...Thu Jun 20 14:59:36 EDT 2003
Working...Thu Jun 20 15:01:53 EDT 2003
Working...Thu Jun 20 15:05:32 EDT 2003

The new kernel is /sys/SYSNAME/vmunix
```

12. Copy the new custom kernel.

- On a single system, use the following command to copy the new custom kernel to /vmunix:

```
cp /sys/SYSNAME/vmunix /vmunix
```

- On cluster member *N* where you installed the hardware, use the following command to copy the new custom kernel to the member-specific directory:

```
cp /sys/SYSNAME/vmunix /cluster/members/memberN/boot_partition
```

13. Shut down your system:

```
shutdown -h now
```

14. At the console prompt, boot the lead member with the new custom kernel:

```
>>> boot -fi "vmunix" dqb0
```



## A

---

**accessing shell during Full Installation**, 3-1  
**acquiring the NHD kit**, 1-1  
**AlphaServer DS20L**, 2-3

## B

---

**before installing NHD-7**  
setting up SA5300A, 3-2  
**Broadcom 5703 cluster interconnect**,  
2-3

## C

---

**cluster installation**  
( *See installing NHD* )  
**creating a CD image**  
on a Version 5.1A system, 5-2  
on a Version 5.1B system, 4-2

## D

---

**documentation**  
available on the Web, 1-2  
**DS15/TS15**, 2-1  
**DS20L**  
boot messages, 3-4  
daemon.log error messages, 3-4  
startup with no IDE disks, 3-1  
**DS25**  
boot messages, 3-4  
daemon.log error messages, 3-4  
startup with no IDE disks, 3-1

## E

---

**environmental monitoring**  
configuration, 2-2  
daemon, 2-2  
envconfig utility, 2-2  
ES47/ES80/GS1280, 2-2  
**error messages**  
patch kit installation, 3-5  
RIS Installation, 3-5  
**ES47/ES80/GS1280**  
environmental monitoring, 2-2  
functional support, 2-1  
hardware interrupt redistribution, 2-2

**EV68 processor**, 2-1

## F

---

**firmware**  
caution when updating, 3-1  
**Full Installation**  
( *See installing NHD* )

## H

---

**hardware**  
( *See supported hardware* )

## I

---

**IDE disks**  
DS20L startup without, 3-1  
DS25 startup without, 3-1  
**ignore these messages**  
DS20L boot, 3-4  
**installing NHD**  
new single system  
from CD-ROM, 5-12  
**installing NHD on Version 5.1A**  
creating a CD image for, 5-2  
error messages during, 3-4  
error messages with patch kits, 3-5  
error messages with RIS, 3-5  
existing cluster, 5-13  
Clean Stage, 5-22  
Install Stage, 5-16  
Postinstall Stage, 5-19  
Preinstall Stage, 5-16  
Preparation Stage, 5-14  
Roll Stage, 5-19  
Setup Stage, 5-14  
Switch Stage, 5-21  
existing single system, 5-5  
Full Installation  
accessing shell during, 3-1  
on new cluster, 5-23  
on new single system, 5-7  
new single system  
from CD-ROM, 5-8  
from RIS, 5-12  
preparing for on, 5-1  
**installing NHD on Version 5.1B**  
creating a CD image for, 4-2  
error messages during, 3-4

- error messages with patch kits, 3-5
- error messages with RIS, 3-5
- existing cluster, 4-13
  - Clean Stage, 4-22
  - Install Stage, 4-16
  - Postinstall Stage, 4-19
  - Preinstall Stage, 4-16
  - Preparation Stage, 4-14
  - Roll Stage, 4-19
  - Setup Stage, 4-14
  - Switch Stage, 4-21
- existing single system, 4-5
- Full Installation
  - accessing shell during, 3-1
  - on new cluster, 4-23
  - on new single system, 4-7
- new single system, 4-7
  - from CD-ROM, 4-8
  - from RIS, 4-12
- preparing for, 4-1

## K

---

### kernel

- rebuilding after adding hardware, 5-25

## N

---

### NHD kit

- acquiring, 1-1
- downloading, 1-1
- installing on Version 5.1A, 5-4
- installing on Version 5.1B, 4-4
- ordering CD-ROM, 1-1
- release notes for, 1-2

## P

---

### patch kit

- release notes and installation instructions for, 1-2

### patch kit installation

- error messages, 3-5

## R

---

### reference pages

- envconfig, 2-2
- envmond, 2-2

### release notes, 3-1

### resources, 1-2

#### RIS installation

- error messages, 3-5
- preparation for on Version 5.1A, 5-3
- preparation for on Version 5.1B system, 4-3

#### Rolling Upgrade on Version 5.1A

- Preparation Stage, 5-14
- Setup Stage, 5-14
- Preinstall Stage, 5-16
- Install Stage, 5-16
- Postinstall Stage, 5-19
- Roll Stage, 5-19
- Switch Stage, 5-21
- Clean Stage, 5-22

- tag file creation message, 3-4

#### Rolling Upgrade on Version 5.1B

- Preparation Stage, 4-14
- Setup Stage, 4-14
- Preinstall Stage, 4-16
- Install Stage, 4-16
- Postinstall Stage, 4-19
- Roll Stage, 4-19
- Switch Stage, 4-21
- Clean Stage, 4-22

- tag file creation message, 3-4

## S

---

### SA5300A, 3-2

- setting up, 3-2
  - SRM console, 3-2
  - kernel rebuild, 3-3
- support for, 2-3

### shell access during Full Installation, 3-1

### Smart Array 5300A RAID controllers ( See SA5300A )

### support

- ( See resources )

### supported hardware, 2-1

## T

---

### Titan chipset, 2-1

## W

---

### Web sites

- ( See resources )