

Tru64 UNIX New Hardware Delivery Release Notes and Installation Instructions

February 2003

Product Version: NHD-6 for Tru64 UNIX Versions 5.1A
and 5.1B

The New Hardware Delivery Release Notes and Installation Instructions for NHD-6 describes the contents of this release and tells you how to install the NHD-6 kit onto your system. NHD-6 requires HP Tru64 UNIX Version 5.1A or 5.1B.

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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.

Audience

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

New and Changed Features

This section describes the changes to this manual since the NHD-5 release:

- The following hardware is supported in NHD-6 and described in *Chapter 1*:
 - AlphaServer ES47/ES80/GS1280 functional support (*Section 1.1*)
 - AlphaServer DS20L systems (*Section 1.2*)
 - Broadcom 5703 communication processors as cluster interconnect devices (*Section 1.3*)
 - Smart Array 5300A series RAID controllers (*Section 1.4*)
- NHD-6 provides support to both Versions 5.1A and 5.1B of the operating system. The release notes in *Chapter 2* are organized into three sections:
 - Release notes common to both Versions 5.1A and 5.1B (*Section 2.1*)
 - Release notes specific to Version 5.1A (*Section 2.2*)
 - Release notes specific to Version 5.1B (*Section 2.3*)

Versions of this manual for previous NHD releases are available on the World Wide Web at the following URL:

<http://www.tru64unix.compaq.com/docs/nhd/>

Technical updates to this manual are also available on the World Wide Web at the following URL:

http://www.tru64unix.compaq.com/docs/pub_page/nhd_update.html/

Organization

This manual is organized as follows:

<i>Chapter 1</i>	Explains New Hardware Delivery concepts and describes the hardware supported in the NHD-6 kit.
<i>Chapter 2</i>	Provides notes and restrictions pertaining to the NHD-6 kit and its supported hardware.
<i>Chapter 3</i>	Tells you where to get the NHD-6 kit and how to install it on your system.
<i>Appendix A</i>	Describes the wake-on-LAN utility and provides reference information.

Related Documentation

You may find the following HP Tru64 UNIX documents helpful when you install NHD-6:

- The documentation for the hardware supported in NHD-6.
- 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://www.tru64unix.compaq.com/docs/>

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- 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, <code>cat(1)</code> indicates that you can find information on the <code>cat</code> 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/ <i>x</i>	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).

1

Introduction

This chapter explains the New Hardware Delivery (NHD) process and describes the contents of the NHD-6 kit.

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.

A New Hardware Delivery (NHD) kit includes kernel modules that let your system support new or upgraded hardware. The kit is distributed on CD-ROM and also can be downloaded from the World Wide Web.

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
```

The NHD-6 release includes support for the following hardware:

- AlphaServer ES47/ES80/GS1280 functional support (Section 1.1)
- AlphaServer DS20L systems (Section 1.2)
- Broadcom 5703 communication processors as cluster interconnect devices (Section 1.3)
- Smart Array 5300A series RAID controllers (Section 1.4)

1.1 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 the following AlphaServer ES47/ES80/GS1280 functionality is included in NHD-6 for Version 5.1B only:

- Hardware interrupt redistribution (Section 1.1.1)
- Enhanced environmental monitoring (Section 1.1.2)

1.1.1 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-6 provides support for the ability to indict a failing or potentially failing CPU.

1.1.2 Enhanced Environmental Monitoring

NHD-6 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-6 provides support for action based on the status of any individual sensor rather than the single worst-case sensor model. The `envmon.mod` kernel module is no longer supported on the AlphaServer ES47/ES80/GS1280 hardware platforms.

NHD-6 support for these enhancements includes updates to the `envmond(8)` and `envconfig(8)` reference pages.

Table 1–1 lists the location of environmental monitoring reference page files in the NHD-6 kit distribution:

Table 1–1: Environmental Monitoring Reference Pages

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

1.2 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-6 supports AlphaServer DS20L systems for Versions 5.1A and 5.1B.

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)

1.3 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-6 supports the Broadcom 5703 communication processor as a cluster interconnect device for TruCluster configurations running Versions 5.1A and 5.1B.

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

1.4 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-6 supports SA5300A series RAID controllers for Versions 5.1A and 5.1B.

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-6 Release Notes

This chapter describes known issues and restrictions pertaining to the NHD-6 kit, and is divided into the following sections:

- Release notes common to both Versions 5.1A and 5.1B (Section 2.1)
- Release notes specific to Version 5.1A (Section 2.2)
- Release notes specific to Version 5.1B (Section 2.3)

2.1 Common Release Notes

The following release notes apply to NHD-6 on both Versions 5.1A and 5.1B of the operating system:

- Firmware version (Section 2.1.1)
- Updating firmware may cause system to hang (Section 2.1.2)
- Documentation (Section 2.1.3)
- Patch kit compatibility (Section 2.1.4)
- Shell access during Full Installation (Section 2.1.5)
- Full Installation only on DS20L (Section 2.1.6)
- DS20L or DS25 startup with no IDE disks (Section 2.1.7)
- Setting up Smart Array 5300A controllers (Section 2.1.8)
- Installation messages (Section 2.1.9)

2.1.1 Required Firmware

On AlphaServer ES47/ES80/GS1280 systems, this kit requires that the following console firmware be installed:

SRM V6.4-9 or higher.

2.1.2 Updating Firmware May Cause a System to Hang

After loading 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 performing 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-6 kit is installed on the RIS server.

There are two workarounds:

- Physically pull the cable from the 3X-DEGXA NIC before starting the installation.
- Add the NHD6 kit to the WCA RIS area. This is the recommended workaround.

2.1.3 Documentation

The following notes apply to NHD-6 documentation:

- The NHD-6 includes software applicable to Versions 5.1A and 5.1B. Software for each release is located in the following directories on the distribution media:
 - /520 — Version 5.1A
 - /540 — Version 5.1B

Where sample listings reflect common output, a placeholder such as *nnn* is used instead of listing both 520 and 540. Where appropriate, similar placeholders are used throughout documented listings and messages.

- The files and their layout in the NHD-6 kit distribution may be updated after this manual is published. Subsequently, the listings and messages documented in this manual may differ slightly from what you see on your system. This should have no effect on your installation.
- Some listings and messages may have a backslash (\) at the end of a line to indicate line continuation. The backslash character does not appear in the actual display.
- Updates to this manual after publication are provided in the form of technical updates, available at the following URL:

http://www.tru64unix.compaq.com/docs/pub_page/nhd_update.html

2.1.4 Patch Kit Compatibility

When you install NHD-6, you also must install the most current patch kit from the operating system Version 5.1A or 5.1B before you return your system to production. It does not matter whether you install NHD-6 or the patch kit first.

Tru64 UNIX Versions 5.1A and 5.1B patch kits are available on the World Wide Web at the following URLs:

<http://ftp.support.compaq.com/public/unix/v5.1a/>

<http://ftp.support.compaq.com/public/unix/v5.1b/>

Section 2.1.9.4 describes messages you may see if you install the current patch kit before you install NHD-6.

2.1.5 Shell Access During Full Installation

If you are installing NHD-6 from the New Hardware Delivery CD-ROM during a Full Installation and you try to launch a shell window, it will fail. You 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.

2.1.6 Full Installation Only on DS20L

You must install the NHD-6 kit during a Full Installation of the operating system on a DS20L system. The kernel modules to support the DS20L system are included in the NHD-6 kit.

2.1.7 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.

2.1.8 Setting Up SA5300A Controllers

This section discusses issues related to installing NHD-6 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-6 kit during a Full Installation of the operating system. If you install NHD-6 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-6 during a Full Installation of the operating system. If you are installing NHD-6 onto a system already running Version 5.1A or 5.1B 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-6 during a Full Installation, follow the instructions in Section 2.1.8.1 before you install the NHD-6 kit. This applies whether you are installing to an SA5300A-backed disk or to a non-SA5300A disk.
 - If you are installing NHD-6 onto a system already running Version 5.1A or 5.1B of the operating system and you have changed the value of the `heap_expand` console variable, follow the instructions in both Section 2.1.8.1 and Section 2.1.8.2 before you install the NHD-6 kit.

2.1.8.1 Performing SRM Console Actions

Before you install NHD-6 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 5.1A or 5.1B 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 2.1.8.2 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-6 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-6 during a Full Installation, you are ready to follow the instructions in Chapter 3.
- If you are installing NHD-6 onto a system that includes SA5300A series RAID controllers and is already running Version 5.1A or 5.1B of the operating system and you have changed the value of the `heap_expand` console variable, follow the steps in Section 2.1.8.2 before you install NHD-6.

2.1.8.2 Rebuilding the Kernel After Changing HEAP_EXPAND

If you are installing NHD-6 onto a system that includes SA5300A series RAID controllers and is already running Version 5.1A or 5.1B of the operating system, make sure you have performed all of the SRM console

actions in Section 2.1.8.1. 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="ffffffc0000230000"
```

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 `ffffffc0000230000`.

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.

2.1.9 Installation Messages

The following sections describe messages related to installing the NHD-6 kit and recommend what action to take.

2.1.9.1 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.

2.1.9.2 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 ISOLATINI
```

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

2.1.9.3 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.

2.1.9.4 Older File Installation Error Messages

If you install the current patch kit from Version 5.1A or 5.1B of the operating system before you install the NHD-6 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-6 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.

2.1.9.5 RIS Installation Error Messages

If you are installing NHD-6 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.

2.1.9.6 mknod Installation Error Message

When you install NHD-6 during a Full Installation or with the `nhd_install` utility, either from a CD-ROM or CD image, you may see messages similar to the following when the installation process is loading the NHD base subset:

```
Copying from /instkit1/nnn/kit (disk)
/usr/sbin/setld: mknod: not found
/usr/sbin/setld: /var/tmp/pipe5255: cannot open
Working...Thu May 23 14:23:11 EDT 2002
Verifying
mkfifo: /var/tmp/pipe5255: File exists
```

These reflect known issues and can be ignored.

2.2 Version 5.1A Release Notes

The following release notes apply only to NHD-6 on Version 5.1A of the operating system:

- Full Installation only on DS25 (Section 2.2.1)
- Installation messages (Section 2.2.2)

See Section 2.1 for release notes common to both Versions 5.1A and 5.1B of the operating system.

2.2.1 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 NHD-6 kit during a Full Installation of the operating system. The kernel modules to support the DS25 are included in the NHD-6 kit.

If you have a DS25 system already running Version 5.1A with NHD-5, you can use the `nhd_install` script to install NHD-6.

2.2.2 Installation Messages

The following sections describe messages related to installing the NHD-6 kit and recommend what action to take.

2.2.2.1 Rolling Upgrade Status Messages

If you are installing NHD-6 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.

2.3 Version 5.1B Release Notes

The following release notes apply only to NHD-6 on Version 5.1B of the operating system:

- Installing NHD-6 before the current Version 5.1B patch kit (Section 2.3.1)

2.3.1 Installing NHD-6 Before the Current Version 5.1B Patch Kit

If you are installing NHD-6 on ES47/ES80/GS1280 systems and encounter difficulty accessing the network to download the current Version 5.1B patch kit over the network, install the NHD-6 kit first.

NHD-6 Installation Instructions

This chapter tells you how to prepare for installation, where to get the NHD-6 kit, and how to install it on your system. It includes the following topics:

- Preparing to install NHD (Section 3.1)
- Getting the NHD kit (Section 3.2)
- Installing the NHD kit (Section 3.3)

3.1 Preparing for NHD-6 Installation

Follow these steps before you install NHD-6:

1. If your system already is running Version 5.1A or 5.1B of the operating system, perform a full backup of your system.
2. Get the NHD-6 kit as described in Section 3.2.
3. Determine the NHD kit to install.
 - The installable Version 5.1A kit is located on the distribution media at `/520/usr/sys/hardware/base.kit`.
 - The installable Version 5.1B kit is located on the distribution media at `/540/usr/sys/hardware/base.kit`.
4. If necessary, create an NHD-6 kit CD image as described in Section 3.2.3.
5. If you are installing from a RIS server, perform the following tasks:
 - a. Set up the RIS area as described in Section 3.2.4.1.
 - b. Register your system as a RIS client as described in Section 3.2.4.2.

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

6. If your system already is running a version of the operating system, shut down your system.
7. Upgrade your system to the latest version of firmware for your processor.
8. Determine the console name of your system disk and any devices you will use for software distributions, such as the NHD-6 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
9. At the console prompt, set the value of the `bootdef_dev` variable to null:

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

```
>>> set auto_action halt
```
 11. At the console prompt, set the value of the `boot_osflags` variable to `a`:

```
>>> set boot_osflags a
```
 12. Power down your system.
 13. Review your hardware documentation and install your new hardware.

Note

If you add supported hardware after NHD-6 is already installed on your system, follow the instructions in Section 3.3.5 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.

14. Power up your system.
15. Install NHD-6 according to the instructions in Section 3.3.

Caution

Before you install NHD-6 onto a system that includes SA5300A series RAID controllers, see the release notes in Section 2.1.8. Failure to follow these instructions can cause your NHD-6 installation to fail.

3.2 Getting the NHD-6 Kit

This section tells you how to acquire the NHD-6 kit and what to do before you install it.

- You can get the NHD-6 kit from two sources:
 - Order it on CD-ROM from your Tru64 UNIX sales or service representative (Section 3.2.1).
 - Download it from the World Wide Web (Section 3.2.2).
- If you download the NHD-6 kit, you must create a CD image on disk (Section 3.2.3).
- If you are going to install NHD-6 from a RIS server, you must prepare for RIS installation (Section 3.2.4).

3.2.1 Ordering the NHD-6 Kit on CD-ROM

Contact your Tru64 UNIX sales or service representative at 1-800-888-0220. Order part number QA-MT4AX-H8 to get the NHD-6 kit on CD-ROM.

3.2.2 Downloading the NHD-6 Kit

You can download the NHD-6 kit from the World Wide Web at one of the following URLs:

<http://ftp.support.compaq.com/public/unix/v5.1a/nhd/6.0/>

<http://ftp.support.compaq.com/public/unix/v5.1b/nhd/6.0/>

This directory includes the following files:

nhd6.CHSUM - NHD-6 kit checksum information
 nhd6.README - NHD-6 customer letter
 nhd6.tar.gz - Compressed and archived NHD-6 kit

3.2.3 Creating an NHD-6 Kit CD Image

These instructions assume that you have downloaded the NHD-6 kit to /usr/tmp. Before you create a CD image, you must 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-6 kit distribution for installation purposes. It does not allow you to burn a CD-ROM from this image.

Follow these steps to create the NHD-6 CD image on disk:

1. Log in as root.
2. Create a new UFS file system on the spare disk. For example:

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

You 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]
```

3. Enter **y** to continue. You 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,
580640, 616928, 653216, 689504, 725792, 762080, 798368, 834656,
870944, 907232, 943520, 979808, 1016096, 1052384, 1088672, 1124960,
1157152, 1193440, 1229728, 1266016, 1302304, 1338592, 1374880, 1411168,
1447456, 1483744, 1520032, 1556320, 1592608, 1628896, 1665184, 1701472,
1737760, 1774048, 1810336, 1846624, 1882912, 1919200, 1955488, 1991776,
2028064, 2064352, 2100640, 2136928, 2173216, 2209504, 2245792, 2282080,
2314272, 2350560, 2386848, 2423136, 2459424, 2495712, 2532000, 2568288,
2604576, 2640864, 2677152, 2713440, 2749728, 2786016, 2822304, 2858592,
2894880, 2931168, 2967456, 3003744, 3040032, 3076320, 3112608, 3148896,
3185184, 3221472, 3257760, 3294048, 3330336, 3366624, 3402912, 3439200,
3471392, 3507680, 3543968, 3580256, 3616544, 3652832, 3689120, 3725208,
3761696, 3797984, 3834272, 3870560, 3906848, 3943136, 3979424, 4015712,
4052000, 4088288, 4124576, 4160864, 4197152, 4233440, 4269728, 4306016,
4342304, 4378592, 4414880, 4451168, 4487456, 4523744, 4560032, 4596320,
4632512, 4668800, 4705088, 4741376, 4777664, 4813952, 4850240, 4886528,
4922816, 4959104, 4995392, 5031680, 5067968, 5104256, 5140544, 5176832,
5213120, 5249408, 5285696, 5321984, 5358272, 5394560, 5430848, 5467136,
5503424, 5539712, 5576000, 5612288, 5648576, 5684864, 5721152, 5757440,
5793728, 5830016, 5866304, 5902592, 5938880, 5975168, 6011456, 6047744,
6084032, 6120320, 6156608, 6192896, 6229184, 6265472, 6301760, 6338048,
6374336, 6410624, 6446912, 6483200, 6519488, 6555776, 6592064, 6628352,
6664640, 6700928, 6737216, 6773504, 6809792, 6846080, 6882368, 6918656,
6954944, 6991232, 7027520, 7063808, 7100096, 7136384, 7172672, 7208960,
7245248, 7281536, 7317824, 7354112, 7390400, 7426688, 7462976, 7499264,
7535552, 7571840, 7608128, 7644416, 7680704, 7716992, 7753280, 7789568,
7825856, 7862144, 7898432, 7934720, 7971008, 8007296, 8043584, 8079872,
8116160, 8152448, 8188736, 8225024, 8261312, 8297600, 8333888,
```

4. Mount the spare disk where you will create the CD image. For example:

```
# mount /dev/disk/dsk2c /mnt
```

5. Change directory to the new file system:

```
# cd /mnt
```

6. Enter the following command to extract the NHD-6 kit into the CD image:

```
# gzcat /usr/tmp/nhd6.tar.gz | tar xvf -
```

You see a list of files as they are extracted.

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

```
# cd /
# umount /mnt
```

You have created an NHD-6 CD image on the disk at `/dev/disk/dsk2c`.

3.2.4 Preparing for RIS installation

If you are installing NHD-6 from a RIS server, you first must do the following:

1. Set up the RIS area on the RIS server (Section 3.2.4.1).
2. Register the RIS client (Section 3.2.4.2).

Note

Although the examples in this section show the NHD-6 distribution on CD-ROM, you can use a CD image created from the downloaded NHD-6 kit, as described in Section 3.2.2 and Section 3.2.3.

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.

3.2.4.1 Setting Up the RIS Area

Follow these steps to create a RIS area for NHD-6 on your RIS server:

1. Use the `ris` utility to install Version 5.1A or 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 may install TruCluster Server and Worldwide Language Support in the same RIS area.

2. Load the NHD-6 CD-ROM into the RIS server's CD-ROM drive.
3. Mount the NHD-6 distribution. For example:

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

4. Run the `update_ris` script to install the NHD-6 kit into the RIS area. For example:

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

You 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 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 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-6 support
```

3.2.4.2 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.
-

3.3 Installing the NHD-6 Kit

This section tells you how to install the NHD-6 kit on a system in one of the following configurations:

- Single system already running Version 5.1A or 5.1B (Section 3.3.1)
- Single system during Full Installation of Version 5.1A or 5.1B:
 - Installing from a CD-ROM or CD image (Section 3.3.2.1)
 - Installing from RIS (Section 3.3.2.2)
- Cluster already running Version 5.1A or 5.1B (Section 3.3.3)
- Cluster during Full Installation of Version 5.1A or 5.1B (Section 3.3.4)

Note

You can install NHD-6 from CD-ROM or a CD image that you create from the downloaded kit.

If you are installing NHD-6 during a Full Installation, you can install from a RIS area.

3.3.1 Installing on a Single System Running Version 5.1A or 5.1B

Before you start this procedure, you must have the NHD-6 distribution. See Section 3.2 for information about how to get the NHD-6 kit and, if necessary, how to create an NHD-6 kit CD image.

Note

You cannot use RIS to install NHD-6 with this method.

You cannot use this method to install NHD-6 on a DS25 system. See Section 3.3.2 for instructions on installing NHD-6 on a single system during a Full Installation of Version 5.1A or 5.1B.

Caution

Before you install NHD-6 onto a system that includes SA5300A series RAID controllers, see the release notes in Section 2.1.8. Failure to follow these instructions can cause your NHD-6 installation to fail.

Follow these steps to install NHD-6 on a single system that already is running Version 5.1A or 5.1B of the operating system:

1. Log in as `root`.
2. Mount the NHD-6 kit. For example:

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

3. Change directory to the mounted NHD-6 kit. For example:

```
# cd /mnt
```

4. Run the `nhd_install` script:

```
# ./nhd_install
```

You see output similar to the following:

```
Using kit at /mnt/nnn

Checking file system space required to install specified subsets:

File system space checked OK.

2 subsets will be installed.

Loading subset 1 of 1 ...

New Hardware Base System Support V6.0
Copying from /mnt/nnn/kit (disk)
Working....Thu Jun 20 13:59:55 EDT 2002

Verifying

1 of 1 subsets installed successfully.

Configuring "New Hardware Base System Support V6.0" (OSHHWBASEnnn)

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
```

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 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]:
```

9. Enter `y` and press Return. You 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]:

10. Select the kernel options you want built into your new custom kernel. This should 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 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]:

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

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

12. Enter **n** and press Return. You 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 2002
Working...Thu Jun 20 15:01:53 EDT 2002
Working...Thu Jun 20 15:05:32 EDT 2002

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

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

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

14. Shut down the system:

```
# shutdown -h now
```

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

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

Caution

When you install NHD-6, you also must install the most current Version 5.1A or 5.1B patch kit before you return your system to production. It does not matter whether you install NHD-6 or the release-appropriate patch kit first.

Tru64 UNIX Versions 5.1A and 5.1B patch kits are available on the World Wide Web at the following URLs:

<http://ftp.support.compaq.com/public/unix/v5.1a/>

<http://ftp.support.compaq.com/public/unix/v5.1b/>

3.3.2 Installing on a Single System During Full Installation of Version 5.1A or 5.1B

You can install NHD-6 on a single system during a Full Installation of the operating system from either of the following sources:

- NHD-6 kit on CD-ROM or on a CD image that you created from the downloaded kit (Section 3.3.2.1)
- NHD-6 kit in a RIS area along with the base operating system. (Section 3.3.2.2)

See Section 3.2 for information on getting the NHD kit, creating a CD image, and setting up a RIS area.

Caution

Before you install NHD-6 onto a system that includes SA5300A series RAID controllers, see the release notes in Section 2.1.8. Failure to follow these instructions can cause your NHD-6 installation to fail.

3.3.2.1 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-6 kit and the Tru64 UNIX Operating System distribution. See Section 3.2 for information about how to get the NHD-6 kit and, if necessary, create an NHD-6 kit CD image.

Follow these steps to install NHD-6 on a single system during a Full Installation:

1. If your system already is running a version of the operating system, log in as `root` and shut down the system.
2. What you do next depends upon the media you are using:
 - If you are using a single CD-ROM drive, load the Version 5.1A or 5.1B Tru64 UNIX Operating System CD-ROM into your CD-ROM drive.
 - If you are using multiple CD-ROM drives, load the Version 5.1A or 5.1B Tru64 UNIX Operating System CD-ROM into one CD-ROM drive and the New Hardware Delivery CD-ROM into another CD-ROM drive.
 - If you are using one or more CD images, make sure that the disks containing the CD images are on line and available.
 - If you are using a combination of CD-ROMs and CD images, make sure that all distribution media are on line and available.
3. At the console prompt, boot the generic kernel. For example:

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

You 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-6 kit is located.

4. Enter the console device name of the device where the NHD-6 kit is located:
 - If you are installing from a CD-ROM, enter the console device name of the CD-ROM drive. For example, **dqb0**.
 - If you are installing from a CD image on disk, enter the console device name of that disk. For example, **dka400**.
5. Press Return. You see a prompt similar to the following:

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

6. Enter the NHD-6 kit name:

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

You see a prompt similar to the following:

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

7. What you do next depends upon the media you are using:
 - If you are installing from a single CD-ROM drive, remove the Tru64 UNIX Operating System CD-ROM and load the New Hardware Delivery CD-ROM.
 - If you are installing from multiple CD-ROM drives, CD images, or both, do nothing.
8. Press Return. You see the following prompt:

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

9. Press Return. You see the following prompt:

```
Enter Device Name, or <return> if done:
```

10. Press Return, and the boot process verifies the NHD-6 kit. You see the following prompt:

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

11. What you do next depends upon the media you are using:

- If you are installing from a single CD-ROM drive, remove the New Hardware Delivery CD-ROM and load the Tru64 UNIX Operating System CD-ROM.
- If you are installing from multiple CD-ROM drives, CD images, or both, do nothing.

12. Press Return. As the base operating system kernel modules are linked, you see messages similar to the following:

```
Linking nnn objects: nnn nnn
...
105 104 103 102 101 100 99 98 97 96 95 94 93 92 91 90 89 88 87 86 85 84 83
82 81 80 79 78 77 76 75 74 73 72 71 70 69 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 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
```

Note

You may see a different number of objects linked, as the NHD-6 kit is updated several times before the distribution is finalized.

You see a prompt similar to the following:

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

13. What you do next depends upon the media you are using:

- If you are installing from a single CD-ROM drive, remove the Tru64 UNIX Operating System CD-ROM and load the New Hardware Delivery CD-ROM.
- If you are installing from multiple CD-ROM drives, CD images, or both, do nothing.

14. Press Return. As the NHD-6 kit kernel modules are linked, you see messages similar to the following:

```
8 7 6 5 4 3 2 1
```

Note

You may see a different number of objects linked, as the NHD-6 kit is updated several times before the distribution is finalized.

You see a prompt similar to the following:

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

15. What you do next depends upon the media you are using:
 - If you are installing from a single CD-ROM drive, remove the New Hardware Delivery CD-ROM and load the Tru64 UNIX Operating System CD-ROM.
 - If you are installing from multiple CD-ROM drives, CD images, or both, do nothing.
16. Press Return. You see the operating system boot and the Full Installation user interface start.
17. 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 see messages similar to the following:

```
UNIX boot - Wednesday, August 01, 2001

Loading /GENERIC ...
Loading at fffffffc0000250000

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

Enter Device Name, or <return> if done:
```

18. Enter the console device name for the NHD-6 kit, for example: **dqb0**. You see the following prompt:

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

19. Enter the NHD-6 kit name:

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

You see a prompt similar to the following:

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

20. What you do next depends upon the media you are using:

- If you are installing from a single CD-ROM drive, remove the Tru64 UNIX Operating System CD-ROM and load the New Hardware Delivery CD-ROM.
- If you are installing from multiple CD-ROM drives, CD images, or both, do nothing.

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

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

22. Because there are no other kits included in NHD-6, press Return. You see the following prompt:

```
Enter Device Name, or <return> if done:
```

23. Again, because there are no other kits to install, press Return. You 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.

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

```
Linking nnn objects: nnn nnn
...
...
105 104 103 102 101 100 99 98 97 96 95 94 93 92 91 90 89 88 87 86 85 84 83
82 81 80 79 78 77 76 75 74 73 72 71 70 69 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 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
Insert media for kit 'dka400:/nnn/usr/sys/hardware/base.kit'
hit <return> when ready or 'q' to quit:
```

25. If you removed the NHD-6 kit media, replace it. When the NHD-6 kit media is in place, press Return.

You see messages similar to the following:

```
8 7 6 5 4 3 2 1
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.

26. Press Return. You see the standard subset installation and configuration messages.

When the hardware kit is loaded and configured, you see messages similar to the following:

```
*** START LOAD HARDWARE KIT (Thu Jun 20 16:07:30 EDT 2002) ***

Validating distribution media...

The Hardware Support product has been successfully located.

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 V6.0
  Copying from /instkit1//nnn/kit (disk)
  Verifying

1 of 1 subsets installed successfully.

*** SYSTEM CONFIGURATION ***

Configuring "New Hardware Base System Support VTru64 UNIX.0" (OSHHWBASEnnn)

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

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

*** END LOAD HARDWARE KIT (Thu Jun 20 16:09:35 EDT 2002) ***
```

Note

If you are installing the Worldwide Language Support (WLS) subsets, you are prompted to insert the Associated Products, Volume 1 CD-ROM. See the Tru64 UNIX *Installation Guide* for information about installing WLS subsets.

You see messages similar to the following as the kernel is rebuilt:

```
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 16:13:24 EDT 2002
```

```
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.

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

3.3.2.2 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-6 kit and the Base Operating System distribution. See Section 3.2 for information about how to get the NHD-6 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, boot from the RIS server. For example:

```
>>> boot ewa0
```

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

3. 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-6 from a RIS server:

- After the base operating system subsets are installed, you see the New Hardware Base System Support V6.0 subset installed from the RIS server.
- During system configuration, you see messages similar to the following as NHD-6 is configured and the generic kernel is rebuilt:

```
Configuring "New Hardware Base System Support V6.0" (OSHHWBASEnnn)

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

4. You 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 2002
```

```
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.

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

Caution

When you install NHD-6, you also must install the most current Version 5.1A or 5.1B patch kit before you return your system to production. It does not matter whether you install NHD-6 or the release-appropriate patch kit first.

Tru64 UNIX Versions 5.1A and 5.1B patch kits are available on the World Wide Web at the following URLs:

<http://ftp.support.compaq.com/public/unix/v5.1a/>

<http://ftp.support.compaq.com/public/unix/v5.1b/>

3.3.3 Installing on a Cluster Running Version 5.1A or 5.1B

Before you install NHD-6 on an existing cluster, see the Rolling Upgrade chapter in the TruCluster Server *Cluster Installation* manual. You must have the NHD-6 kit distribution, the Tru64 UNIX Operating System CD-ROM, and the Associated Products, Volume 2, CD-ROM that includes the TruCluster Server software. See Section 3.2 for information about how

to get the NHD-6 kit and, if necessary, create an NHD-6 kit CD image or prepare for RIS installation.

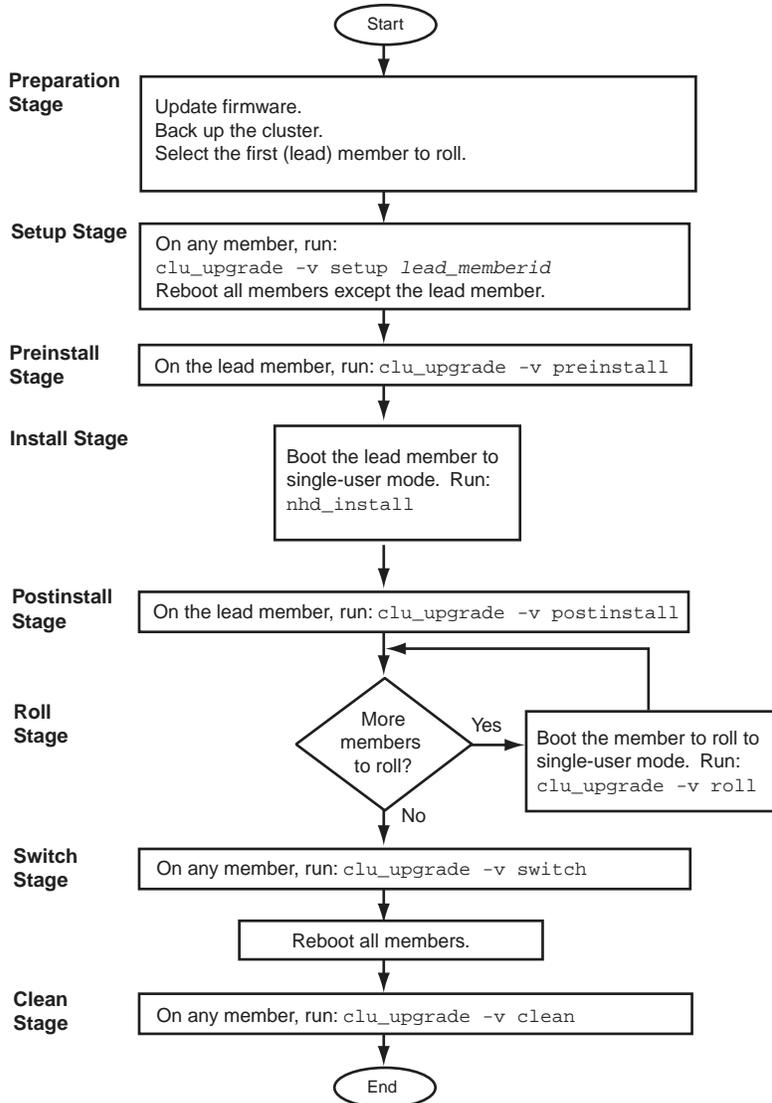
Caution

Before you install NHD-6 onto a system that includes SA5300A series RAID controllers, see the release notes in Section 2.1.8. Failure to follow these instructions can cause your NHD-6 installation to fail.

Perform a Rolling Upgrade as described in the following sections to install NHD-6 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 3–1 shows a simplified flow chart of the tasks and stages that are part of an NHD Rolling Upgrade.

Figure 3–1: NHD Rolling Upgrade



ZK-1870U-AI

3.3.3.1 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.

3.3.3.2 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 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 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 3 and press Return. You see the following messages:

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

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

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

5. Enter the NHD kit mount point, for example: `/mnt`, and press Return. You 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]:
```

6. Enter **yes** and press Return . You 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 nnn /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.

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

3.3.3.3 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 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 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 where created. If you feel that the tagged files have not changed
since they where 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 do want to check tagged files, enter **no** at the prompt and press Return. You see the following message, followed by a progress indicator:

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

- If you want to skip tagged file checking, enter **yes** and press Return.

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

```
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

You may see the following message during this step:

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

This is a known error and can be ignored.

3.3.3.4 Install Stage

Perform the following steps in the Install Stage:

1. Make sure that the NHD-6 distribution is still mounted.
2. Change directory to the mounted NHD-6 kit. For example:

```
# cd /mnt
```
3. Use the `nhd_install` script to install the NHD-6 kit on the lead member:

```
# ./nhd_install
```
4. At the shell prompt, shut down the system:

```
# shutdown -h now
```
5. At the console prompt, boot the generic kernel. For example:

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

```
# doconfig
```

You see messages similar to the following:

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

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

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

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

9. Enter **y** and press Return. You 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 pkt 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]:
```

10. Select the kernel options you want built into your new custom kernel. This should 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 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 pkt 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]:

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

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

12. Enter **n** and press Return. You 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 2002
Working....Thu Jun 20 15:01:53 EDT 2002
Working....Thu Jun 20 15:05:32 EDT 2002

The new kernel is /sys/SYSNAME/vmunix

```

13. 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
```

14. Shut down the lead member:

```
# shutdown -h now
```

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

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

16. Log in as root on the lead member.

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

```
# clu_upgrade -v
```

You see messages similar to the following:

```

Retrieving cluster upgrade status.
Upgrade Status

Stage          Status          Date
-----
setup          started:        Thu Jun 20 16:50:43 EDT 2002
                lead member:    1
                nhd kit source: /mnt
                completed:   Thu Jun 20 16:52:34 EDT 2002
preinstall    started:        Thu Jun 20 16:54:46 EDT 2002

```

```

                completed:          Thu Jun 20 16:55:16 EDT 2002
nhd             started:            Thu Jun 20 16:55:57 EDT 2002
                completed:          Thu Jun 20 16:57:42 EDT 2002

```

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

Note

If your system is running Version 5.1A, the 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.

3.3.3.5 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 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 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 see messages similar to the following:

```
Retrieving cluster upgrade status.
Upgrade Status

Stage      Status      Date
-----
setup     started:    Thu Jun 20 16:50:43 EDT 2002
          lead member: 1
          nhd kit source: /mnt
          completed: Thu Jun 20 16:52:34 EDT 2002
```

```

preinstall  started:           Thu Jun 20 16:54:46 EDT 2002
            completed:        Thu Jun 20 16:55:16 EDT 2002

nhd         started:           Thu Jun 20 16:55:57 EDT 2002
            completed:        Thu Jun 20 16:57:42 EDT 2002

postinstall started:           Thu Jun 20 16:58:28 EDT 2002
            completed:        Thu Jun 20 16:58:28 EDT 2002

roll        started:           Thu Jun 20 16:58:29 EDT 2002
            members rolled:    1
            completed:        Thu Jun 20 16:58:29 EDT 2002

```

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

Note

If your system is running Version 5.1A, the 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.

3.3.3.6 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 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 kevmm tty00 tty01 lp0 dsk3 dsk4 dsk5 dsk6 dsk7 dsk8 floppy1 cdrom1 dmap1
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 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 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? []:

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

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

- Enter **y** and press Return. You 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.

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

```
# clu_upgrade -v
```

You see messages similar to the following:

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

Stage	Status	Date
setup	started:	Thu Jun 20 16:40:07 EDT 2002
	lead member:	1
	nhd kit source:	/mnt
	tagged files list:	/cluster/admin/clu_upgrade/tag_files.list
	completed:	Thu Jun 20 16:42:48 EDT 2002
preinstall	started:	Thu Jun 20 16:51:09 EDT 2002
	completed:	Thu Jun 20 16:52:32 EDT 2002
nhd	started:	Thu Jun 20 16:54:49 EDT 2002
	completed:	Thu Jun 20 16:58:08 EDT 2002
postinstall	started:	Thu Jun 20 17:18:12 EDT 2002
	completed:	Thu Jun 20 17:18:12 EDT 2002
roll	started:	Thu Jun 20 17:22:24 EDT 2002
	members rolled:	1 10
	completed:	Thu Jun 20 17:32:42 EDT 2002

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

Note

If your system is running Version 5.1A, the 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.

Repeat this process for each remaining cluster member.

3.3.3.7 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 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 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 see messages similar to the following:

```
Retrieving cluster upgrade status.
```

```
Upgrade Status
```

Stage	Status	Date
setup	started:	Thu Jun 20 16:40:07 EDT 2002
	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 2002

```

preinstall  started:          Thu Jun 20 16:51:09 EDT 2002
            completed:       Thu Jun 20 16:52:32 EDT 2002

nhd         started:          Thu Jun 20 16:54:49 EDT 2002
            completed:       Thu Jun 20 16:58:08 EDT 2002

postinstall started:          Thu Jun 20 17:18:12 EDT 2002
            completed:       Thu Jun 20 17:18:12 EDT 2002

roll        started:          Thu Jun 20 17:22:24 EDT 2002
            members rolled:  1 10
            completed:       Thu Jun 20 17:32:42 EDT 2002

switch      started:          Thu Jun 20 16:37:50 EDT 2002
            completed:       Thu Jun 20 16:38:20 EDT 2002

```

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

Note

If your system is running Version 5.1A, the 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.

3.3.3.8 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 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 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 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 2002  
History for this upgrade can be found in the directory:  
/cluster/admin/clu_upgrade/history/Compaq.Tru64.UNIX.V5.1x.Rev.1885-1
```

Caution

When you install NHD-6, you also must install the most current Version 5.1A or 5.1B patch kit before you return your system to production.

- You must install both the Tru64 UNIX and the TruCluster patches.
- It does not matter whether you install NHD-6 or the release-appropriate patch kits first.

Tru64 UNIX Versions 5.1A and 5.1B patch kits are available on the World Wide Web at the following URLs:

<http://ftp.support.compaq.com/public/unix/v5.1a/>

<http://ftp.support.compaq.com/public/unix/v5.1b/>

3.3.4 Installing on a Cluster During Full Installation of Version 5.1A or 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-6 kit distribution, the Version 5.1A or 5.1B Tru64 UNIX Operating System CD-ROM, and the Associated Products, Volume 2, CD-ROM that includes the Version 5.1B TruCluster Server software.

Caution

Before you install NHD-6 onto a system that includes SA5300A series RAID controllers, see the release notes in Section 2.1.8. Failure to follow these instructions can cause your NHD-6 installation to fail.

Follow these steps to install NHD-6 on a new cluster during a Full Installation:

1. Install NHD-6 during a Full Installation on the system that will be the first cluster member, as described in Section 3.3.2.
2. Load the Version 5.1A or 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 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 diskpace(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 diskpace(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 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 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" (TCRMIGRATEnnn)

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

Configuring "TruCluster Base Components" (TCRBASEnnn)

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-6 kit. For example:

```

# mount /dev/disk/cdrom0a /mnt

```

10. Change directory to the mounted NHD-6 kit. For example:

```

# cd /mnt

```

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

```
# ./install_nhd
```

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 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/nnn/kit (disk)
    Working....Thu Jun 20 18:16:41 EDT 2002
  Verifying

1 of 1 subsets installed successfully.

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

The installation of the New Hardware TruCluster(TM) Support V6.0 (OSHTCRBASEnnn)
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 for more information.
13. Add additional cluster members as needed. See the *TruCluster Server Cluster Installation* manual for more information.

Caution

When you install NHD-6, you also must install the most current Version 5.1A or 5.1B patch kit before you return your system to production.

- You must install both the Tru64 UNIX and the TruCluster patches.
- You must install TruCluster Server software before you install TruCluster patches.
- It does not matter whether you install NHD-6 or the release-appropriate patch kits first.

Tru64 UNIX Versions 5.1A and 5.1B patch kits are available on the World Wide Web at the following URLs:

```
http://ftp.support.compaq.com/public/unix/v5.1a/
```

```
http://ftp.support.compaq.com/public/unix/v5.1b/
```

3.3.5 Rebuilding the Kernel After Adding Supported Hardware

The preceding instructions tell you to install the supported hardware before you install the NHD-6 kit. There may be circumstances where you must add supported hardware after NHD-6 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 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 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 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. This should 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 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 see the following prompt:

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

11. Enter **n** and press Return. You 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 2002
Working...Thu Jun 20 15:01:53 EDT 2002
Working...Thu Jun 20 15:05:32 EDT 2002

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

Wake-On-LAN Utility

The wake-on-LAN (wol) utility allows you to send a network packet from another system on the same subnet to power on a target system where this feature is supported.

This utility and its reference page are included in Version 5.1B. For Version 5.1A, the wol(8) utility is included in the NHD-6 kit at `./520/usr/sbin/wol`, and multiple versions of the reference page are included in the `./DOC/man8` directory.

Name

wol — Send network packet over subnet to turn on target system power

Synopsis

`/usr/sbin/wol` [*nw_interface*] *hw_address*

Options

nw_interface

Specifies the network interface to use in making the connection to the target system, for example: `tu1`. This argument is optional.

Operands

hw_address

Specifies the hardware network address of the target system, for example: `0A-1B-2C-3D-5E-6F`. This argument is mandatory.

Description

The wol utility (wake-on-LAN) generates and transmits a network packet to power on a remote system on the same subnet. Before you can use the wol utility, you must enable the remote system management wake-on-LAN feature on the target system.

You must specify the target system's hardware address. You may optionally specify the network interface to use in making the connection to the target system. If no network interface is specified, the wol utility locates the first configured network interface and prompts you for confirmation.

To enable the wake-on-LAN feature, set the target system's `wol_enable` console variable to `on` and reset the system so that the network controller can read the new state. Use one of the following methods to enable this feature on the target system:

- From the target system's console prompt, enter the following commands:

```
>>> set wol_enable on
>>> init
```

- From the target system's UNIX root prompt, enter the following commands:

```
% consvar -s wol_enable on
set wol_enable = on
% consvar -a
Console environment variables saved
% reboot
```

Use one of the following methods to disable the wake-on-LAN feature:

- From the target system's console prompt, enter the following commands:

```
>>> set wol_enable off
>>> init
```

- From the target system's UNIX root prompt, enter the following commands:

```
% consvar -s wol_enable off
set wol_enable = on
% consvar -a
Console environment variables saved
% reboot
```

Note

You must reset the target system for the new setting to take effect.

Restrictions

You must be logged in as `root` or have superuser privileges to use the `wol` utility.

The target system must be on the same subnet as the system where you invoke the `wol` utility.

You cannot turn off the power on a target system with the `wol` utility.

The wake-on-LAN feature is only available on specific platforms. On platforms that support this feature, additional restrictions may apply. For example, the wake-on-LAN feature may be supported on specific network

interface ports only. See your hardware documentation for additional information.

Exit Status

0 (Zero) Success.

>0 An error occurred.

Errors

```
Error detecting default interface
```

Explanation:

The `wol` utility cannot detect a default network interface automatically.

User Action:

- Verify that a configured network interface exists on your system.
- Manually specify a configured network interface on the `wol` command line.

```
Patterns must be specified as hex digits
```

```
The Magic Packet address must be specified as 00-11-22-33-44-55
```

Explanation:

The hardware network address entered was in the wrong format. This argument must be in the following format: `xx-xx-xx-xx-xx-xx`, where `x` is a hexadecimal character (0 through 9 and A through F, inclusive).

User Action:

Specify the hardware network address correctly.

```
wand: socket: Address family not supported by protocol family
```

Explanation:

The system where you entered the `wol` command is not on the same subnet as the target system.

User Action:

Enter the `wol` command on a system that is on the same subnet as the target system.

Examples

1. The following example shows a simple use of the `wol` utility, where the host system detects the first configured network interface and prompts for confirmation:

```
# /usr/sbin/wol 00-02-56-00-03-29
No sending device specified, using tu0, continue? (y/n) y
```

2. The following example shows the same use of the `wol` utility, where the user declines confirmation of the selected network interface:

```
# /usr/sbin/wol 00-02-56-00-03-29
No sending device specified, using tu0, continue? (y/n) n
Aborting...
```

3. The following example explicitly specifies a network interface:

```
# /usr/sbin/wol tu1 00-02-56-00-03-29
```

Environment Variables

`wol_enable`

Enables or disables the wake-on-LAN feature on the target system.
Valid values are `on` and `off`.

Note

This is a system console variable, not a UNIX environment variable. The *Description* section tells you how to enable the wake-on-LAN feature on the target system. You must enable this feature before you use the `wol` utility.

Files

`/usr/sbin/wol`

Wake-on-LAN utility.

See Also

Commands: `consvar(8)`, `halt(8)`, `reboot(8)`, `shutdown(8)`

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(See NHD)

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