

# Tru64 UNIX New Hardware Delivery

## Release Notes and Installation Instructions

Part Number: 00-2NHD4-03

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**Product Version:** NHD4 for Tru64 UNIX Version 5.1A

*The New Hardware Delivery Release Notes and Installation Instructions* for NHD4 describes the contents of this release and tells you how to install the NHD4 kit on your system. NHD4 requires Compaq Tru64™ UNIX Version 5.1A.

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## About This Manual

New Hardware Delivery (NHD) provides installable kernel support for new hardware without requiring you to install a new release of the operating system. NHD kits can be ordered on CD or downloaded from the World Wide Web. This manual describes the contents of an NHD kit and how to acquire and install it. It does not tell you how to create an NHD kit.

### Audience

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

### Organization

This manual is organized as follows:

<i>Chapter 1</i>	Explains New Hardware Delivery concepts and describes the hardware supported in the NHD4 kit.
<i>Chapter 2</i>	Provides notes and restrictions pertaining to the NHD4 kit and its supported hardware.
<i>Chapter 3</i>	Tells you where to get the NHD4 kit and how to install it on your system.

### Related Documentation

You may find the following Tru64 UNIX documents helpful when you install NHD4:

- 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 advanced installation procedures such as Installation Cloning, Configuration Cloning, and how to customize the installation process with user supplied files.
- The *Cluster Installation* manual describes cluster preparation, installation, and creation and how to perform a rolling upgrade on the Tru64 UNIX operating system.

- The *clu\_upgrade Quick Reference* Best Practice, intended for experienced system administrators, describes how to use the `clu_upgrade` command for all stages of a rolling upgrade of TruCluster Server.
- 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. It assumes a knowledge of operating system concepts, commands, and configurations.
- *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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## Conventions

The following conventions are used in this manual:

<code>%</code>	A percent sign represents the C shell system prompt.
<code>\$</code>	A dollar sign represents the system prompt for the Bourne, Korn, and POSIX shells.
<code>#</code>	A number sign represents the superuser prompt.
<code>% cat</code>	Boldface type in interactive examples indicates typed user input.
<i>file</i>	Italic (slanted) type indicates variable values, placeholders, and function argument names.
<code>[ ]</code> <code>{ }</code>	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.
<code>...</code>	In syntax definitions, a horizontal ellipsis indicates that the preceding item can be repeated one or more times.
<code>cat(1)</code>	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.
<code>Return</code>	In an example, a key name enclosed in a box indicates that you press that key.

Ctrl/x

This symbol indicates that you hold down the first named key while pressing the key or mouse button that follows the slash. In examples, this key combination is enclosed in a box (for example, Ctrl/C).



---

## Introduction

This chapter explains the New Hardware Delivery (NHD) process and describes the contents of the NHD4 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` utility 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 NHD4 release includes support for the following hardware:

- 3Dlabs Oxygen VX1 2D AGP graphics controller (Section 1.1)
- Compaq AlphaServer DS20L system (Section 1.2)

## 1.1 VX1 AGP Graphics Controller

The 3Dlabs Oxygen VX1 AGP graphics controller provides accelerated 2D graphics port (AGP) support as well as support for PCI platforms on Compaq AlphaServer ES45 Model 1B systems. The kernel device driver supports

AGP transactions on the AGP bus and adds direct memory access (DMA) support, where the original VX1 PCI driver only supported programmed I/O (PIO). This release includes the device-dependent libraries for the Xserver, also supporting DMA. 3D graphics are not supported.

The orderable part number for the VX1 AGP graphics controller is SN-PBXGF-BC.

## 1.2 AlphaServer DS20L System

The Compaq 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 and the Compaq 21272 core logic chip set. 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, 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 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.

The following are 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)

---

## NHD4 Release Notes

This chapter describes known issues and restrictions pertaining to the NHD4 kit, and includes notes on the following areas:

- Documentation (Section 2.1)
- Patch kit compatibility (Section 2.2)
- Full Installation only on DS20L (Section 2.3)
- DS20L startup with no IDE disks (Section 2.4)
- Shell access during Full Installation (Section 2.5)
- Installation messages (Section 2.6)

### 2.1 Documentation

The files and their layout in the NHD4 kit are updated before production. 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 have a backslash (\) at the end of a line to indicate line continuation. The backslash character does not appear in the actual display.

### 2.2 Patch Kit Compatibility

This section describes issues related to Version 5.1A patch kits and NHD4.

#### 2.2.1 Install Both NHD4 and Patch Kit

When you install NHD4, you also must install the most current Version 5.1A patch kit before you return your system to production. It does not matter which one you install first.

### 2.3 Full Installation Only on DS20L

You must install the NHD4 kit during a Full Installation of the operating system on a DS20L system. The kernel modules to support the DS20L are included in the NHD4 kit.

## 2.4 DS20L Startup with No IDE Disks

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

- If you power on a DS20L 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 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.

## 2.5 Shell Access During Full Installation

If you are installing NHD4 from the *New Hardware Delivery* CD 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.

## 2.6 Installation Messages

This section describes messages related to installing the NHD4 kit and tells you whether to ignore them or take corrective action.

### 2.6.1 DS20L Boot Messages

During a DS20L 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.

2.6.2 DS20L daemon.log Error Messages

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

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

These messages are generated when there is no FRU table available on the system, and can be ignored.

2.6.3 Rolling Upgrade Setup Message

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

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

This reflects a known error and can be ignored.

2.6.4 Rolling Upgrade Status Messages

If you check the cluster upgrade status during a Rolling Upgrade, you see output similar to the following example, done after the Setup Stage is complete:

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

Stage      Status      Date
-----
setup      started:    Thu Oct 25 08:59:48 EDT 2002
           lead member: 1
           patch kit source: /mnt
           completed: Thu Oct 25 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.

2.6.5 AlphaServer 8400 Error Messages

If you are installing NHD4 on an AlphaServer 8400 system that is running Version 5.4 of the console firmware, you may see error messages similar to the following:

```
*** Error (eia0.0.0.4.0), Bad Checksum on eeprom
I82558 setmode failed: pid = 13, config_adap
eil, slot 5, bus 0, hose0
*** Error (eib0.0.0.5.0), Bad Checksum on eeprom
I82558 setmode failed: pid = 13, config_adap
```

These messages will not be displayed after you upgrade your console firmware to Version 5.5 or higher, and can be ignored.

## 2.6.6 Patch Kit Installation Error Messages

If you install NHD4 before you install the current Version 5.1A patch kit, you may see error messages when you install the patch kit. These messages indicate that the patch kit cannot install files that already have been installed with the NHD4 kit and can be ignored.

## 2.6.7 RIS Setup Error Messages

When you run the `update_ris` utility to install NHD4 into a RIS area, you may see messages similar to the following:

```
The /usr/var/adm/ris/ris6.alpha area already contains
NHD support for the following product:
```

```
4      'Tru64 UNIX New Hardware for V5.1A'
```

```
This product must be deleted from the /usr/var/adm/ris/ris6.alpha
area before the new kit can be added.  Use the /usr/sbin/ris command
to remove the product and then run the update_ris command again.
```

Use the `ris` utility to remove NHD4 from the RIS area, and rerun the `update_ris` utility to install NHD4 into the RIS area.

## 2.6.8 RIS Installation Error Messages

If you are installing NHD4 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.

---

## NHD4 Installation Instructions

This chapter tells you how to prepare for installation, where to get the NHD4 kit, and how to install it on your system. This 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 NHD4 Installation

Follow these steps to get ready to install NHD4:

1. If your system is already running Version 5.1A of the operating system, perform a full backup of your system.
2. Get the NHD4 kit as described in Section 3.2.
3. Determine the NHD kit to install. In the NHD4 kit distribution, the installable kit is located at `/520/usr/sys/hardware/base.kit` on the distribution media.
4. If necessary, create an NHD4 kit CD image as described in Section 3.2.3.
5. If you are installing from a RIS server, perform the following tasks:
  - Set up the RIS area as described in Section 3.2.4.1.
  - 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.
6. If your system is already running a version of the operating system, shut down your system:  
  

```
# shutdown -h now
```
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 NHD4 kit, the *Base Operating System* distribution, and the *Associated Products Volume 2* for TruCluster software. This could include the following:
  - Any CD 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. For example:  

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

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

```
>>> set boot_osflags a
```
  12. Power down your system.
  13. Review your hardware documentation and install your new hardware.
  14. Power up your system.
  15. Install NHD4 according to the instructions in Section 3.3.

---

**Note**

---

You can install NHD4 from CD or a CD image that you create from the downloaded kit.

If you are installing NHD4 during a Full Installation, you can install from a RIS area.

---

## 3.2 Getting the NHD4 Kit

This section tells you how to acquire the NHD4 kit and what to do before you install it.

- You can get the NHD4 kit from two sources:
  - Order it on CD-ROM from your Compaq representative (Section 3.2.1)
  - Download it from the World Wide Web (Section 3.2.2)
- If you download the NHD4 kit, you must create a CD image on disk (Section 3.2.3)
- If you are going to install NHD4 from a RIS server, you must prepare for RIS installation (Section 3.2.4)



### 3.2.1 Ordering the NHD4 Kit on CD

Contact your Compaq representative at 1-800-888-0220. Order part number QA-MT4AX-H8 to get the NHD4 kit on CD-ROM.

### 3.2.2 Downloading the NHD4 Kit

You can download the NHD4 kit from the following URL:

<http://ftp.support.compaq.com/public/unix/v5.1a/nhd/4.0/>

This directory includes the following files:

- nhd4.CHSUM - NHD4 kit checksum information
- nhd4.README - NHD4 customer letter
- nhd4.tar.gz - compressed and archived NHD4 kit

### 3.2.3 Creating an NHD4 Kit CD Image

These instructions assume that you have downloaded the NHD4 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 NHD4 kit distribution for installation purposes. It does not allow you to burn a CD from this image.

---

Follow these steps to create the NHD4 CD image on disk:

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

```
# newfs /dev/disk/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,
4632608, 4668896, 4705184, 4741472, 4777760, 4814048, 4850336, 4886624,
4922912, 4959200, 5000000, 5040000, 5080000, 5120000, 5160000, 5200000,
5240000, 5280000, 5320000, 5360000, 5400000, 5440000, 5480000, 5520000,
5560000, 5600000, 5640000, 5680000, 5720000, 5760000, 5800000, 5840000,
5880000, 5920000, 5960000, 6000000, 6040000, 6080000, 6120000, 6160000,
6200000, 6240000, 6280000, 6320000, 6360000, 6400000, 6440000, 6480000,
6520000, 6560000, 6600000, 6640000, 6680000, 6720000, 6760000, 6800000,
6840000, 6880000, 6920000, 6960000, 7000000, 7040000, 7080000, 7120000,
7160000, 7200000, 7240000, 7280000, 7320000, 7360000, 7400000, 7440000,
7480000, 7520000, 7560000, 7600000, 7640000, 7680000, 7720000, 7760000,
7800000, 7840000, 7880000, 7920000, 7960000, 8000000, 8040000, 8080000,
8120000, 8160000, 8200000, 8240000, 8280000, 8320000, 8360000, 8400000,
8440000, 8480000, 8520000, 8560000, 8600000, 8640000, 8680000, 8720000,
8760000, 8800000, 8840000, 8880000, 8920000, 8960000, 9000000, 9040000,
9080000, 9120000, 9160000, 9200000, 9240000, 9280000, 9320000, 9360000,
9400000, 9440000, 9480000, 9520000, 9560000, 9600000, 9640000, 9680000,
9720000, 9760000, 9800000, 9840000, 9880000, 9920000, 9960000, 10000000

```

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 NHD4 kit into the CD image:

```
# gzcatt /usr/tmp/nhd4.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 NHD4 CD image on the disk at `/dev/disk/dsk2c`.

### 3.2.4 Preparing for RIS installation

If you are installing NHD4 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)

See the *Sharing Software on a Local Area Network* manual for RIS information. 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 NHD4 on your RIS server:

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

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#### Caution

---

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

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

---

You optionally may install TruCluster Server and Worldwide Language Support in the same RIS area.

2. Load the NHD4 CD into the RIS server's CD-ROM drive.
3. Mount the NHD4 CD. For example:  

```
# mount /dev/disk/cdrom0a /mnt
```
4. Run the `update_ris` script to install the NHD4 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 V5.1A Operating System (Rev 1885)'
```

```
2) /usr/var/adm/ris/ris8.alpha
'Tru64 UNIX V5.1 Operating System (Rev 732)'
```

```
3) /usr/var/adm/ris/ris6.alpha
'Tru64 UNIX V5.1A Operating System ( Rev 1885 )'
```

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

---

#### Note

---

The number of RIS areas depends upon your RIS server.

---

5. In this example, enter 3 and press Return. You see messages similar to the following:

```
You are updating ris area /usr/var/adm/ris/ris6.alpha for:
V5.1A 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 V5.1A'  
3      'Tru64 UNIX New Hardware for V5.1A'  
Building new network bootable kernel  
/usr/var/adm/ris/ris6.alpha/kit has been updated with NHD4 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.

---

#### Caution

---

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 NHD4 Kit

This section tells you how to install the NHD4 kit on a system in one of the following configurations:

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

---

#### Note

---

You can install NHD4 from CD or a CD image that you create from the downloaded kit.

If you are installing NHD4 during a Full Installation, you can install from a RIS area.

---

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

Before you start this procedure, you must have the NHD4 distribution. See Section 3.2 for information about how to get the NHD4 kit and, if necessary, create an NHD4 kit CD image as described in Section 3.2.3.

---

#### Note

---

You cannot use RIS to install NHD4 with this method.

You cannot use this method to install NHD4 on a DS20L system. See Section 3.3.2 for instructions on installing NHD4 on a single system during a Full Installation of Version 5.1A.

---

Follow these steps to install NHD4 on a single system that is already running Version 5.1A of the operating system:

1. Log in as `root`.
2. Mount the NHD4 kit. For example:  

```
# mount /dev/disk/cdrom0a /mnt
```
3. Change directory to the mounted NHD4 kit. For example:  

```
# cd /mnt
```
4. Run the `nhd_install` script:

```
# ./nhd_install
```

You see output similar to the following:

```
Using kit at /mnt/520

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 V4.0
  Copying from /mnt/520/kit (disk)
    Working....Thu Jan 17 13:59:55 EST 2002

Verifying

1 of 1 subsets installed successfully.

Configuring "New Hardware Base System Support V4.0" (OSHHWBASE520)

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

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

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

```
# shutdown -h now
```

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

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

7. Log in as root.

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

```
# 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 pkt module (PKT)
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....Mon Oct 15 14:59:36 EDT 2002
Working....Mon Oct 15 15:01:53 EDT 2002
Working....Mon Oct 15 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. For example:

```
# shutdown -h now
```

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

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

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

You can install NHD4 on a single system during a Full Installation of the operating system from either of the following sources:

- NHD4 kit on CD or on a CD image that you created from the downloaded kit (Section 3.3.2.1)
- NHD4 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 and, creating a CD image, and setting up a RIS area.

#### 3.3.2.1 Installing from a CD or CD Image

Before you start this procedure, see the *Installation Guide* for information about the Full Installation process. You must have both the NHD4 kit and the *Base Operating System* distribution. See Section 3.2 for information about how to get the NHD4 kit and, if necessary, create an NHD4 kit CD image.

Follow these steps to install NHD4 on a single system during a Full Installation:

1. If your system is already running a version of the operating system follow these steps:
  - a. Log in as `root`.
  - b. Shut down the system. For example:

```
# shutdown -h now
```
2. What you do next depends upon the media you are using.
  - If you are using a single CD drive, load the Version 5.1A *Base Operating System* CD into your CD drive.
  - If you are using multiple CD drives, load the Version 5.1A *Base Operating System* CD into one CD drive and the *New Hardware Delivery* CD into another CD 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 CDs 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 -f1 fa -fi "GENERIC" dqb0
```



You see messages similar to the following:

```
(boot dqb0.0.1.16.0 -file GENERIC -flags fa)
dqb0.0.1.16.0 has no media present or is disabled via the RUN/STOP switch
failed to open dqb0.0.1.16.0
P00>>>boot -fl fa -fi GENERIC dqb0
(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 January 30, 2002

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 NHD4 kit is located.

---

4. Enter the console device name of the device where the NHD4 kit is located.
  - If you are installing from a CD, enter the console device name of the CD 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 NHD4 kit name:

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

You see a prompt similar to the following:

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

7. What you do next depends upon the media you are using.

- If you are installing from a single CD-ROM drive, remove the *Base Operating System* CD and load the *New Hardware Delivery* CD.
- 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 NHD4 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 and load the *Base Operating System* CD.
- 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 195 objects: 195 194 193 192 191 190 189 188 187 186 185 184 183 182
181 180 179 178 177 176 175 174 173 172 171 170 169 168 167 166 165 164 163
162 161 160 159 158 157 156 155 154 153 152 151 150 149 148 147 146 145 144
143 142 141 140 139 138 137 136 135 134 133 132 131 130 129 128 127 126 125
124 123 122 121 120 119 118 117 116 115 114 113 112 111 110 109 108 107 106
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 NHD4 kit is updated several times before the distribution is finalized.

---

You see a prompt similar to the following:

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

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

- If you are installing from a single CD-ROM drive, remove the *Base Operating System* CD and load the *New Hardware Delivery* CD.

- If you are installing from multiple CD-ROM drives, CD images, or both, do nothing.
14. Press Return. As the NHD4 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 NHD4 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 and load the *Base Operating System* CD.
  - 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 January 30, 2002
```

```
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 NHD4 kit, for example: **dqb0**. You see the following prompt:

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

19. Enter the NHD4 kit name:

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

You see a prompt similar to the following:

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

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

- If you are installing from a single CD-ROM drive, remove the *Base Operating System* CD and load the *New Hardware Delivery* CD.
- 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 NHD4, 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:
```

---

### Caution

---

Although this prompt asks you to insert the boot media, do not insert the *Base Operating System* CD. 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 195 objects: 195 194 193 192 191 190 189 188 187 186 185 184 183 182
181 180 179 178 177 176 175 174 173 172 171 170 169 168 167 166 165 164 163
162 161 160 159 158 157 156 155 154 153 152 151 150 149 148 147 146 145 144
143 142 141 140 139 138 137 136 135 134 133 132 131 130 129 128 127 126 125
124 123 122 121 120 119 118 117 116 115 114 113 112 111 110 109 108 107 106
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:/520/usr/sys/hardware/base.kit'
hit <return> when ready or 'q' to quit:
```

25. As you have not removed the NHD4 kit media, press Return. You see messages similar to the following:

```
8 7 6 5 4 3 2 1
Insert boot media, hit <return> when ready:
```

---

### Caution

---

Although this prompt asks you to insert the boot media, do not insert the *Base Operating System* CD. 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 (Wed Jan 09 16:07:30 EST 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 V4.0
  Copying from /instkit1//520/kit (disk)
  Verifying

1 of 1 subsets installed successfully.

*** SYSTEM CONFIGURATION ***

Configuring "New Hardware Base System Support V4.0" (OSHHWBASE520)

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 (Wed Jan 09 16:09:35 EST 2002) ***
```

---

### Note

---

If you are installing the Worldwide Language Support (WLS) subsets, you are prompted to insert the *Associated Products Volume 1* CD. See the *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....Wed Jan 9 16:13:24 EST 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 NHD4 kit and the *Base Operating System* distribution. See Section 3.2 for information about how to get the NHD4 kit and how to prepare for RIS installation.

1. If your system already is running a version of the operating system follow these steps:

- a. Log in as `root`.
- b. Shut down the system. For example:

```
# shutdown -h now
```

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 NHD4 from a RIS server:

- After the base operating system subsets are installed, you see the New Hardware Base System Support V4.0 subset installed from the RIS server.
- During system configuration you see messages similar to the following as NHD4 is configured and the generic kernel is rebuilt:

```
Configuring "New Hardware Base System Support V4.0" (OSHHWBASE520)

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....Mon Jan 28 14:06:34 EST 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.

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

Before you install NHD4 on an existing cluster, see the *Rolling Upgrade* chapter in the Tru64 UNIX *Cluster Installation* manual. You must have the NHD4 kit distribution, the Version 5.1A *Base Operating System* CD, and the *Associated Products Volume 2* CD that includes the Version 5.1A TruCluster Server software. See Section 3.2 for information about how to get the NHD4 kit and, if necessary, create an NHD4 kit CD image or prepare for RIS installation.

---

**Note**

---

You must install NHD4 during a Full Installation if you are installing from RIS, or if you are installing NHD4 on a DS20L system. The kernel modules for the DS20L are included in the NHD4 kit.

Go to Section 3.3.4 to install NHD4 on a cluster during a Full Installation.

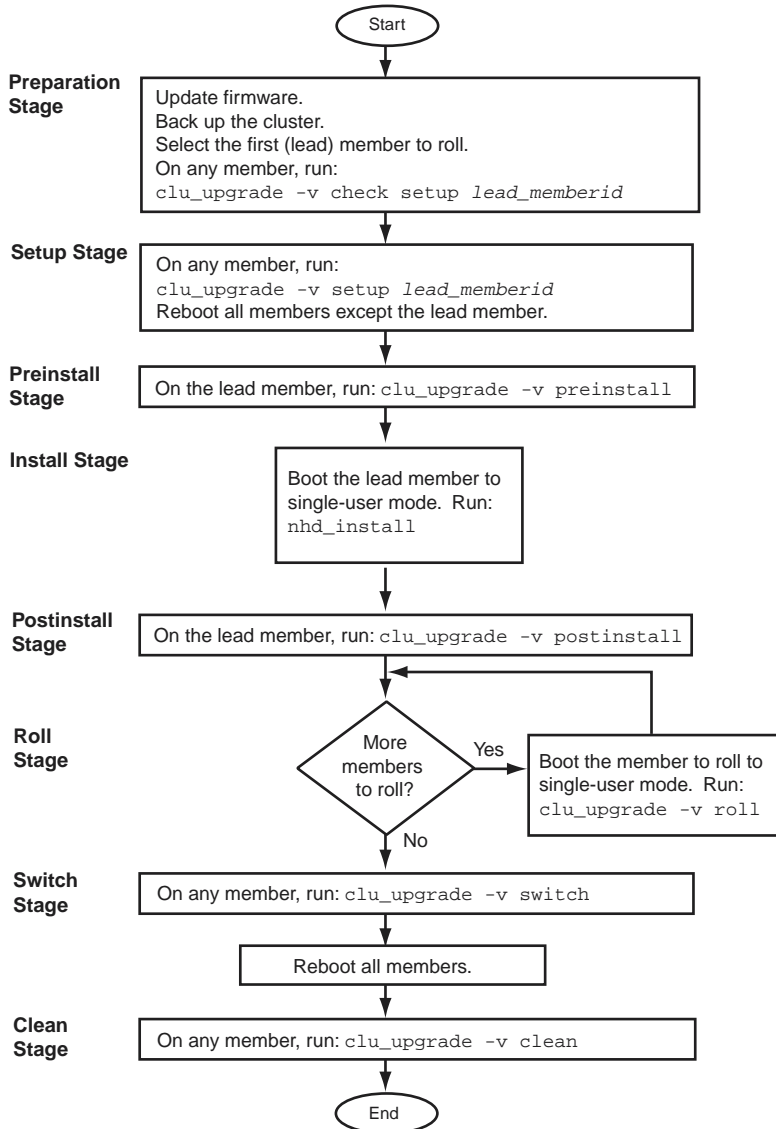
---

Perform a Rolling Upgrade as described in the following sections to install NHD4 on an existing cluster. See the *clu\_upgrade Quick Reference Best Practice* and the *Rolling Upgrade* chapter in the *Tru64 UNIX Cluster Installation* manual for additional 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 *Tru64 UNIX Cluster Installation* manual.

### 3.3.3.2 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 V5.1A'
```

```
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 520 /var/adm/update/NHDKit/
```

```

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

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

```

---

### Note

---

You may see the following message during this step:

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

This is a known error and can be ignored.

---

7. Reboot all your cluster members except the lead member. See the *Rolling Upgrade* chapter in the Tru64 UNIX *Cluster Installation* manual.

### 3.3.3.3 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 right after the Setup Stage, you can skip tagged file checking. If a period of time has elapsed between the Setup Stage and Preinstall Stage, you may want to check the tagged files.
  - If you want to check tagged files, Enter **no** and press Return. You see the following message, followed by a progress indicator:

```

Checking tagged files.
.....

```

- If you want to skip checking tagged files, 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

1. Make sure that the NHD4 distribution is still mounted.
2. Change directory to the mounted NHD4 kit:
 

```
# cd /mnt
```
3. Use the `nhd_install` script to install the NHD4 kit on the lead member:

```
# ./nhd_install
```

You see messages similar to the following:

```
Using kit at /var/adm/520
-rw-r--r-- 1 root system 0 Jan 29 15:06 \
./usr/sys/hardware/database.nhd
the file/files above have changed since initial system load
and the changes cannot be accounted for through the normal
patch or NHD process. If you continue with the installation
these files will be replaced
continue (y or n)y

2 subsets will be installed.

Loading subset 1 of 2 ...

New Hardware Base System Support V4.0
Copying from /var/adm/520/kit (disk)
Verifying

Loading subset 2 of 2 ...

New Hardware TruCluster(TM) Support V4.0
Copying from /var/adm/520/kit (disk)
Verifying
```

```

2 of 2 subsets installed successfully.

*** Starting protofile merges for Tru64 UNIX New Hardware for V5.1A ***

*** Finished protofile merges for Tru64 UNIX New Hardware for V5.1A ***

*** SYSTEM CONFIGURATION ***

Configuring "New Hardware Base System Support V4.0" (OSHHWBASE520) \
on member0

Configuring "New Hardware TruCluster(TM) Support V4.0" (OSHTCRBASE520) \
on member0

The installation of the New Hardware TruCluster(TM) Support V4.0 \
(OSHTCRBASE520) software subset is complete.

Configuring "New Hardware Base System Support V4.0" (OSHHWBASE520) \
on member1

Configuring "New Hardware TruCluster(TM) Support V4.0" (OSHTCRBASE520) \
on member1
rebuilding kernel SYSNAME

*** KERNEL CONFIGURATION AND BUILD PROCEDURE ***

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

*** PERFORMING KERNEL BUILD ***
Working....Wed Jan 30 16:56:41 EST 2002

The new kernel is /sys/SYSNAME/vmunix

The installation of the New Hardware TruCluster(TM) Support V4.0 \
(OSHTCRBASE520) software subset is complete.

```

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

```
# cp /sys/SYSNAME/vmunix
/cluster/members/member1/boot_partition
```

5. Reboot the lead member.
6. Log in as root on the lead member.
7. 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:	Wed Jan 30 16:50:43 EST 2002
	lead member:	1
	patch kit source:	/mnt
	completed:	Wed Jan 30 16:52:34 EST 2002

```

preinstall    started:          Wed Jan 30 16:54:46 EST 2002
               completed:       Wed Jan 30 16:55:16 EST 2002

nhd           started:          Wed Jan 30 16:55:57 EST 2002
               completed:       Wed Jan 30 16:57:42 EST 2002

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

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

```

---

### Note

---

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.

---

### 3.3.3.5 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:        Wed Jan 30 16:50:43 EST 2002
           lead member:    1
           patch kit source: /mnt
           completed: Wed Jan 30 16:52:34 EST 2002

preinstall started:        Wed Jan 30 16:54:46 EST 2002
           completed:   Wed Jan 30 16:55:16 EST 2002

```

```

nhd          started:          Wed Jan 30 16:55:57 EST 2002
             completed:       Wed Jan 30 16:57:42 EST 2002

postinstall  started:          Wed Jan 30 16:58:28 EST 2002
             completed:       Wed Jan 30 16:58:28 EST 2002

roll         started:          Wed Jan 30 16:58:29 EST 2002
             members rolled:   1
             completed:       Wed Jan 30 16:58:29 EST 2002

```

ID	Member	Status	State	Tagged	File	Status
Hostname			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

---

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.

---

### 3.3.3.6 Roll Stage

Before running the Roll Stage, see the *Rolling Upgrade* chapter in the Tru64 UNIX *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. For example:  

```
# shutdown -h now
```
3. At the console prompt, boot the cluster member to single-user mode. For example:  

```
>>> boot -fl s
```
4. Use the `init s` command to initialize process control. For example:  

```
# init s
```
5. Use the `bcheckrc` command to mount and check local file systems. For example:  

```
# 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 filesystem)
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 dmapi
Mounting local filesystems
exec: /sbin/mount_advfs -F 0x14000 cluster_root#root /
cluster_root#root on / type advfs (rw)
exec: /sbin/mount_advfs -F 0x4000 cluster_usr#usr /usr
cluster_usr#usr on /usr: Device busy
exec: /sbin/mount_advfs -F 0x4000 cluster_var#var /var
cluster_var#var on /var: Device busy
/proc on /proc type procfs (rw)

```

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

```
# 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? []:

9. 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]:

10. 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.

11. 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: lead member: patch kit source: tagged files list: tagged files missing: completed:	Wed Jan 30 16:40:07 EST 2002 1 /var/adm /cluster/admin/clu_upgrade/tag_files.list /cluster/admin/clu_upgrade/tag_files.miss Wed Jan 30 16:42:48 EST 2002
preinstall	started: completed:	Wed Jan 30 16:51:09 EST 2002 Wed Jan 30 16:52:32 EST 2002
nhd	started: completed:	Wed Jan 30 16:54:49 EST 2002 Wed Jan 30 16:58:08 EST 2002
postinstall	started: completed:	Wed Jan 30 17:18:12 EST 2002 Wed Jan 30 17:18:12 EST 2002
roll	started: members rolled: completed:	Wed Jan 30 17:22:24 EST 2002 1 10 Wed Jan 30 17:32:42 EST 2002
switch	started: completed:	Wed Jan 30 16:37:50 EST 2002 Wed Jan 30 16:38:20 EST 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

---

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.

---

Repeat this process for each remaining cluster member.

#### 3.3.3.7 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 the member:

```
# reboot
```

The member reboots, and you see the shell 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:	Wed Jan 30 16:40:07 EST 2002
	lead member:	1
	patch kit source:	/var/adm

```

tagged files list: /cluster/admin/clu_upgrade/tag_files.list
tagged files missing: /cluster/admin/clu_upgrade/tag_files.miss
completed: Wed Jan 30 16:42:48 EST 2002

preinstall started: Wed Jan 30 16:51:09 EST 2002
completed: Wed Jan 30 16:52:32 EST 2002

nhd started: Wed Jan 30 16:54:49 EST 2002
completed: Wed Jan 30 16:58:08 EST 2002

postinstall started: Wed Jan 30 17:18:12 EST 2002
completed: Wed Jan 30 17:18:12 EST 2002

roll started: Wed Jan 30 17:22:24 EST 2002
members rolled: 1 10
completed: Wed Jan 30 17:32:42 EST 2002

switch started: Wed Jan 30 16:37:50 EST 2002
completed: Wed Jan 30 16:38:20 EST 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

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.

### 3.3.3.8 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:
Wed Jan 30 17:05:25 EST 2002
History for this upgrade can be found in the directory:
  /cluster/admin/clu_upgrade/history/Compaq.Tru64.UNIX.V5.1A.Rev.1885-1
```

### 3.3.4 Installing on a Cluster During Full Installation of Version 5.1A

Before you start this procedure, see the *clu\_upgrade Quick Reference* Best Practice and the Tru64 UNIX *Cluster Installation* manual for information about creating a cluster. You must have the NHD4 kit distribution, the Version 5.1A *Base Operating System* CD, and the *Associated Products Volume 2* CD that includes the Version 5.1A TruCluster Server software.

Follow these steps to install NHD4 on a new cluster during a Full Installation:

1. Install NHD4 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 *Associated Products Volume 2* CD into the CD drive.
3. Mount the *Associated Products Volume 2* CD. 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 disk space(MB) in root:269.2 usr:18175.4 var:18665.0

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

Or you may choose one of the following options:

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

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

Enter your choices or press RETURN to redisplay menus.

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

```

5. **Enter 3 to select all mandatory and optional subsets. You 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" (TCRMIGRATE520)
```

```
Configuring "TruCluster Reference Pages" (TCRMAN520)
```

```
Running : /usr/sbin/mkwhatiss : in the background...
```

```
Configuring "TruCluster Base Components" (TCRBASE520)
```

```
Use /usr/sbin/clu_create to create a cluster.
```

7. Change to the root directory and unmount the *Associated Products Volume 2* CD:

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

8. What you do next depends upon the media you are using.

- If you are installing from a single CD-ROM drive, remove the *Associated Products Volume 2* CD and load the *New Hardware Delivery* CD.
- If you are installing from multiple CD-ROM drives, CD images, or both, do nothing.

9. Mount the NHD4 kit. For example:

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

10. Change directory to the mounted NHD4 kit. For example:

```
# cd /mnt
```

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

```
# ./install_nhd -install_cluster
```

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 V4.0
```

```
Copying from /mnt/520/kit (disk)
```

```
Working....Wed Jan 30 18:16:41 EST 2002
```

```
Verifying
```

```
1 of 1 subsets installed successfully.
```

```
Configuring "New Hardware TruCluster(TM) Support V4.0" (OSHTCRBASE520)
```

```
The installation of the New Hardware TruCluster(TM) Support V4.0 (OSHTCRBASE520)  
software subset is complete.
```

12. After installing the NHD cluster kit, use the `clu_create` command to create a single-member cluster as described in the *Tru64 UNIX Cluster Installation* manual.

13. Add additional cluster members as needed. See the Tru64 UNIX *Cluster Installation* manual.





---

## Wake-On-LAN Utility

The DS20L system supports the wake-on-LAN (WOL) feature, which allows you to send a network packet from another system on the same subnet to power on a target system, in this case a DS20L. The `wol(8)` utility is included in the NHD4 kit at `./520/usr/sbin/wol`, and a printable version of the reference page is included in portable document format (PDF) at `./DOC/wol.8.pdf`.

### 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)

*System Administration*

---

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### **wake-on-lan utility**

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