Diskless Driver for Tru64 UNIX

Installation Guide

October 2000

This guide describes how to install and use Diskless Driver for Tru64 UNIX on a system running the Tru64 UNIX operating system. It also describes how to access the online release notes before or after installing the product.

Revision/Update Information:	This manual supersedes the *Diskless Driver for Tru64 UNIX Installation Guide*, June 1999 edition.
Operating System & Version:	Tru64 UNIX Version 4.0D or higher
Software Version:	Diskless Driver for Tru64 UNIX Version 2.0B

Compaq Computer Corporation
Houston, Texas

Contents

3 After Installation

A Sample Listings

B Recovering from Errors

Index

Tables

Preface

This installation procedure creates the Diskless Driver for Tru64 UNIX directory structures subordinate to the /usr/lib, /usr/bin, and /usr/man directories, and loads the Diskless Driver for Tru64 UNIX subset components into them.

Keep this guide with your distribution kit. You will need it to install maintenance updates or to reinstall Diskless Driver for Tru64 UNIX for any other reason.

Purpose of This Guide

This guide describes how to install and use Diskless Driver for Tru64 UNIX on a system running the Tru64 UNIX operating system.

Intended Audience

This guide is intended for system managers who install Diskless Driver for Tru64 UNIX.

Associated Documentation

In addition to this guide, installers should refer to the following manuals provided in the Tru64 UNIX documentation set:

- *Installation Guide*
- *Sharing Software on a Local Area Network*
- *System Administration*
- *System Configuration and Tuning*

Conventions

Table 1 describes the conventions used in this guide.

Table 1 Conventions Used in this Guide

Convention	Meaning
#	A pound sign (#) is the default superuser prompt.
%	A percent sign (%) is the default user prompt.
Return	In examples, a boxed symbol indicates that you must press the named key on the keyboard.
Ctrl/C	This symbol indicates that you must press the Ctrl key while you simultaneously press another key (in this case, C).
user input	In interactive examples, this typeface indicates input entered by the user.
`filesystem`	In text, this typeface indicates the exact name of a command, routine, partition, pathname, directory, or file. This typeface is also used in interactive examples and other screen displays.
UPPERCASE lowercase	The Tru64 UNIX operating system differentiates between lowercase and uppercase characters. Examples, syntax descriptions, function definitions, and literal strings that appear in text must be typed exactly as shown.
`setld`(8)	Cross-references to online reference pages include the appropriate section number in parentheses. For example, `setld`(8) indicates that you can find the material on the `setld` command in Section 8 of the reference pages.
`[y]`	In a prompt, square brackets indicate that the enclosed item is the default response. For example, `[y]` means the default response is Yes.

1

Preparing for Diskless Driver for Tru64 UNIX Installation

Your distribution kit includes a cover letter discussing important information that might not be included in this guide or in release notes. You should read this letter now.

The letter also resides on the online documentation CD–ROM, in the Diskless Driver for Tru64 UNIX bookshelf, under the title *Diskless Driver for Tru64 UNIX Read Before Installing*.

1.1 Product Overview

Diskless Driver for Tru64 UNIX is an extension of Dataless Management Services (DMS). DMS is required for installation and use of Diskless Driver for Tru64 UNIX.

In a dataless management environment, a server system maintains the `root`, `/usr`, and `/var` file systems for all client systems. The server maintains one copy of `root` for each client. The `/usr` file system is exported read only and is shared by all clients registered to the environment. Client systems have their own `/var` file system. All swapping and dumping is done on the client's local disk.

When used with DMS, Diskless Driver for Tru64 UNIX eliminates the need for a local disk. A Single Board Computer (SBC) or workstation can run Tru64 UNIX without a disk by booting over the network and paging to a server system using the Network File System (NFS).

The features of Diskless Driver for Tru64 UNIX are desirable to customers who need to place their system in hostile environments (for example, on airplanes, ships, or tanks) where disks tend to be the first component to fail. Diskless Driver for Tru64 UNIX will allow them to boot and page over the network from a server outside the hostile environment or from a system in the environment containing ruggedized disks.

1.2 Reading the Online Release Notes

Diskless Driver for Tru64 UNIX provides online release notes. Compaq strongly recommends that you read the release notes before using the product. The release notes may contain information about changes to the software. Online release notes in text format are supplied in an optional installation subset and are placed in the directory /usr/opt/DDU202.

The release notes for Diskless Driver for Tru64 UNIX are in the following files:

```
/usr/opt/DDU202/ddu202_relnotes.*
```

For information about installing these release notes before installing Diskless Driver for Tru64 UNIX, see Section 2.3.1.

The release notes are provided in PostScript and text formats. You can use the following command to read the text version of the release notes after Diskless Driver for Tru64 UNIX is installed:

```
% more /usr/opt/DDU202/ddu202_relnotes.txt
```

1.3 Checking the Software Distribution Kit

Use the Bill of Materials (BOM) to check that you have the correct software distribution kits. Each distribution includes the full software distribution kit.

In addition to this guide, the software distribution kit includes the following:

- A CD–ROM optical disk for systems with optical disk drives
- A CD–ROM booklet and CD–ROM read first letter

If your software distribution kit is damaged or incomplete, contact your Compaq representative.

1.4 Checking Installation Procedure Requirements

This section discusses various requirements for installing Diskless Driver for Tru64 UNIX. A local installation or RIS server installation requires approximately five minutes.

1.4.1 Checking Login Privileges

You must have superuser privileges to install the Diskless Driver for Tru64 UNIX software.

1.4.2 Checking Hardware Requirements

To install Diskless Driver for Tru64 UNIX, you need the following hardware:

- Software distribution device (if installing from media)

  Locate the CD–ROM drive for the CD–ROM software distribution media. The CD booklet or the documentation for the CD–ROM drive you are using explains how to load the CD–ROM media.

- Terminal

  You can use either a hardcopy or video terminal to communicate with the operating system and respond to prompts from the installation procedure.

See the Diskless Driver for Tru64 UNIX Software Product Description (SPD) for additional hardware requirements.

1.4.3 Checking Software Requirements

DMS Server

The DMS server node requires the following software:

- Tru64 UNIX Operating System. For operating system prerequisites and dataless configuration requirements, refer to the Tru64 UNIX Software Product Description, SPD 41.61.xx (Version 4.n) or SPD 70.70.xx (Version 5.n).
- Dataless Management Services (DMS). Refer to the Tru64 UNIX Server Extensions Software Product Description (SPD 44.35.xx) for DMS information.

Diskless Client

The client node requires the Tru64 UNIX Operating System Version 4.0D or higher. Refer to the Tru64 UNIX Software Product Description, SPD 41.61.xx (Version 4.n) or SPD 70.70.xx (Version 5.n), for operating system prerequisites.

Diskless Driver for Tru64 UNIX also requires that the following Tru64 UNIX software subsets be loaded on the client system where you install Diskless Driver for Tru64 UNIX:

- OSFBASE—the “Base System” subset
- OSFCLINET—Basic Networking Services
- OSFNFS—NFS Utilities

1.4 Checking Installation Procedure Requirements

To install the Diskless Driver for Tru64 UNIX reference pages (manual pages), the following Tru64 UNIX software subset must be installed on the system where you install Diskless Driver for Tru64 UNIX:

- OSFDCMT—Doc Tools for Manpages

To check whether these subsets are loaded, follow these steps:

1. Log in to the system where you will install Diskless Driver for Tru64 UNIX.
2. Enter the following command:

   ```
   # setld -i | egrep 'OSFBASE|OSFCLINET|OSFNFS'
   ```

If you do not log in as superuser (login name `root`), you must enter the full path of the command. For example:

```
% /usr/sbin/setld -i | grep OSFBASE
```

Check the displayed rows for the name of the relevant subset and any related patches. The word "installed" appears in a row after the subset identifier when a subset is loaded. If the word "installed" does not appear (the second column in a row is blank), the subset or patch is not loaded. In this case, you must load the missing Tru64 UNIX software before installing Diskless Driver for Tru64 UNIX. (For information on how to load the operating system software, see the *Tru64 UNIX Installation Guide*.)

1.4.4 Determining Which Subsets to Load

You must choose the Diskless Driver for Tru64 UNIX subsets you want to load.

The Diskless Driver for Tru64 UNIX subsets have the following titles:

- DDUBASE

  Diskless Driver for Tru64 UNIX

- DDUDOC

  Diskless Driver for Tru64 UNIX documentation

1.4.5 Determining Disk Space Requirements

Table 1–1 lists the disk space requirements for loading Diskless Driver for Tru64 UNIX software subsets. These requirements apply to the disks where you load the Diskless Driver for Tru64 UNIX subsets. The requirements are listed by directory for convenience if you are doing installations on systems where these directories are mount points for different disk partitions.

1.4 Checking Installation Procedure Requirements

Table 1–1 Diskless Driver for Tru64 UNIX Subset Sizes (Kilobytes Required)

Subset Title	Subset Name	/usr
Diskless Driver for Tru64 UNIX Documentation	DDUDOC202	575
Diskless Driver for Tru64 UNIX Software	DDUBASE202	115
Total:		690

Using these disk space requirements, total the values for the subsets you will load in each directory.

Compare the space required for subsets with the free space currently on the disks where Diskless Driver for Tru64 UNIX files will reside.

Checking Current Disk Space

To check the current amount of free space for a directory path, log in to the system where you will install Diskless Driver for Tru64 UNIX. You can check which directories are mounted and their locations by viewing the /etc/fstab file. For example:

```
# more /etc/fstab
/dev/rd0a:/:rw:1:1:ufs::
/dev/rd0g:/usr:rw:1:2:ufs::
/usr/staff/r1/leslie@bigsys:/usr/staff/r1/leslie:rw:0:0:nfs:bg:
/usr/man@bigsys:/usr/man:ro:0:0:nfs:bg:
```

The example display indicates that /usr (mounted to /dev/rd0g) is the only mount point that affects where Diskless Driver for Tru64 UNIX files will reside; the system has only one local disk drive, and the /usr/lib and file system reside in the g partition of the disk on that drive.

To check the total space and the free space for the directories where Diskless Driver for Tru64 UNIX will reside, enter the df command. Given the previous display of the /etc/fstab file, which shows that only /usr is a mount point, you need to check free space only in the /usr file system. For example:

```
# df /usr
Filesystem   Total    kbytes   kbytes   %
node         kbytes   used     free     used  Mounted on
/dev/rd0g     122598   54447   55892    49%   /usr
```

This display shows that there are 55,892 Kbytes free. This free space must accommodate the subset requirements listed in Table 1–1.

1.4 Checking Installation Procedure Requirements

On systems where /usr/lib and /usr/man are mounted to different devices from /usr, enter the following command:

```
# df /usr/lib /usr/man
```

In this case, you compare space required for Diskless Driver for Tru64 UNIX files in /usr/lib to the free space displayed in the first line of the df output list, and compare the space required for Diskless Driver for Tru64 UNIX files in /usr/man to the free space displayed in the second line of that list.

1.5 Removing Previous Versions of Diskless Driver for Tru64 UNIX

You *must* deinstall previous versions of Diskless Driver for Tru64 UNIX before installing Diskless Driver Version 2.0B or higher.

To remove a version of Diskless Driver for Tru64 UNIX from your system, delete each subset that you previously installed. To delete subsets:

1. Log in as superuser (login name root).
2. Make sure you are at the root directory (/) by entering the following command:

   ```
   # cd /
   ```

3. Enter the following form of the setld command:

   ```
   # setld -i | grep "DDU"
   ```

4. Look for the word "installed" in the listing produced, and then delete the installed subsets. For example:

   ```
   # setld -d DDUBASEnnn DDUDOCnnn
   ```

1.6 Installing from Media or Using RIS

Someone from your site must perform at least one Diskless Driver for Tru64 UNIX installation from the distribution medium. Your site system manager can then decide whether or not to make a Diskless Driver for Tru64 UNIX distribution kit available online so that subsequent installations of Diskless Driver for Tru64 UNIX can use the Remote Installation Service (RIS). For information on extracting Diskless Driver for Tru64 UNIX subsets to a RIS distribution area, see *Sharing Software on a Local Area Network*, provided in the Tru64 UNIX documentation set.

If you expect to use Diskless Driver for Tru64 UNIX subsets from the RIS area of a remote system for installation on your local system, first check with your site system manager to ensure that:

- Your system is registered as a RIS client.
- A Diskless Driver for Tru64 UNIX subset is installed in the server area and is available for use.

If Diskless Driver for Tru64 UNIX subsets are available to you on a RIS server system, you must know the name of that system to start the installation procedure described in this guide.

For more information on installing Diskless Driver for Tru64 UNIX from a RIS distribution area, see Section 2.2.

1.7 Backing Up Your System Disk

Compaq recommends that you back up your system disk before installing any software. For information about backing up your system disk, see the Tru64 UNIX system documentation.

1.8 Stopping the Installation

To stop the installation procedure at any time, press Ctrl/C. You must then delete files created up to this point interactively. To get a list of the directories and files created during the installation, use the following command:

```
# setld -i subsetname
```

In this command, *subsetname* is the name of the subset you have chosen to install.

2

Installing Diskless Driver for Tru64 UNIX

This chapter describes how to install Diskless Driver for Tru64 UNIX. It includes the following sections:

- Section 2.1, Installing from the CD–ROM
- Section 2.2, Installing from a RIS Distribution Area
- Section 2.3, Responding to Installation Procedure Prompts

Before you start the installation, read Chapter 1, which describes general options and requirements for installing the product.

You can install Diskless Driver for Tru64 UNIX locally (using CD–ROM media) or from a server area (RIS).

If you encounter any failures during installation, see Appendix B.

2.1 Installing from the CD–ROM

This procedure loads Diskless Driver for Tru64 UNIX files on to a disk belonging to the system where you perform the installation. When Diskless Driver for Tru64 UNIX is run, its executable images are mapped into memory on your system.

Follow these steps to install Diskless Driver for Tru64 UNIX from CD–ROM media:

1. Mount the media on the appropriate disk drive.
2. Log in as superuser (login name `root`) to the system where you will install Diskless Driver for Tru64 UNIX.
3. Make sure you are at the root (/) directory by entering the following command:

```
# cd /
```

4. Mount the installation CD-ROM onto an existing local directory. If your drive is /dev/rz3c, enter a command like the following:

   ```
   # mount -dr /dev/rz3c /mnt
   ```

5. Enter a setld command that requests the load function (-l) and identifies the directory in the mounted file system where Diskless Driver for Tru64 UNIX subsets are located.

   For example, if the directory location for these subsets is /mnt, enter the following command:

   ```
   # setld -l /mnt/ddu202/kit
   ```

The installation procedure now displays the names of Diskless Driver for Tru64 UNIX subsets and asks you to specify the subsets you want to load.

See Section 2.3 to continue the installation.

2.2 Installing from a RIS Distribution Area

You can install Diskless Driver for Tru64 UNIX using the ris utility. The ris utility performs remote installation services to install software from a disk area on the server for a client machine through the TCP/IP local network. See *Sharing Software on a Local Area Network*, provided in the Tru64 UNIX documentation set, for more information about setting up a RIS area.

If you are installing Diskless Driver for Tru64 UNIX subsets that reside in an /etc/ris RIS distribution area on a remote system, follow these steps:

1. Log in as superuser (login name root) to the system where you will install Diskless Driver for Tru64 UNIX.
2. Make sure you are at the root directory (/) by entering the following command:

   ```
   # cd /
   ```

3. Enter a setld command that requests the load function (-l option) and identifies the system where the Diskless Driver for Tru64 UNIX subsets are located. For example, if you are loading Diskless Driver for Tru64 UNIX subsets from a RIS distribution area on node orion, enter the following:

   ```
   # setld -l orion:
   ```

Remote Installation Services now displays a menu that lists all the software subsets available to you and asks you to specify the subsets you want to load.

See Section 2.3 to continue the installation.

2.3 Responding to Installation Procedure Prompts

After issuing the `setld` command, respond to installation procedure prompts.

2.3.1 Selecting Subsets

Respond to prompts on your screen to indicate which subsets to install.

Note

If you are installing from a RIS distribution area, the number of subsets can vary depending on what products are available in the RIS area and how many subsets they have.

```
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.

     1) Diskless Driver for Tru64 UNIX (V2.0B Rev 202)
     2) Diskless Driver for Tru64 UNIX Documentation (V2.0B Rev 202)

Or you may choose one of the following options:

     3) ALL of the above
     4) CANCEL selections and redisplay menus
     5) EXIT without installing any subsets

Enter your choices or press RETURN to redisplay menus.
```

If you specify more than one number at the prompt, separate each number with a space, not a comma.

Next, the script lets you verify your choice. For example, if you enter `3` in response to the previous prompt, you will see the following display:

```
You are installing the following optional subsets:

        Diskless Driver for Tru64 UNIX (V2.0B Rev 202)
        Diskless Driver for Tru64 UNIX Documentation (V2.0B Rev 202)

Is this correct? (y/n):
```

If the displayed subsets are not the ones you intended to choose, enter `n`. In this case, the subset selection menu is again displayed and you can correct your choice of optional subsets.

If the displayed subsets are the ones you want to load, enter `y`.

2.3 Responding to Installation Procedure Prompts

2.3.2 Monitoring Displays During the Subset Loading Process

The installation procedure loads and verifies the selected Diskless Driver for Tru64 UNIX subsets.

The following example shows a display where all Diskless Driver for Tru64 UNIX subsets are being loaded from CD–ROM:

```
You are installing the following optional subsets:

        Diskless Driver for Tru64 UNIX (V2.0B Rev 202)
        Diskless Driver for Tru64 UNIX Documentation (V2.0B Rev 202)

Is this correct? (y/n): y

Checking file system space required to install selected subsets:

File system space checked OK.

Diskless Driver for Tru64 UNIX (V2.0B Rev 202)
   Copying from /mnt/ddu202/kit (disk)
   Verifying

Diskless Driver for Tru64 UNIX Documentation (V2.0B Rev 202)
   Copying from /mnt/ddu202/kit (disk)
   Verifying

Configuring "Diskless Driver for Tru64 UNIX (V2.0B Rev 202)" (DDUBASE202)

Configuring "Diskless Driver for Tru64 UNIX Documentation (V2.0B Rev 202)" (DDUDOC202)
```

When you see the "Verifying" message during the subset installation, the installation procedure is checking to see that the files are copied correctly; it is not an Installation Verification Procedure (IVP) message.

During the installation, if you get errors from the `setld` utility, see the Diagnostics section of the `setld`(8) reference page for an explanation of the errors and the appropriate actions to take.

Chapter 3 explains how to delete old Diskless Driver for Tru64 UNIX subsets before installing a new version of Diskless Driver for Tru64 UNIX.

3
After Installation

This chapter describes how to configure each client system that will use Diskless Driver for Tru64 UNIX. It also describes how to access the Diskless Driver for Tru64 UNIX documentation.

3.1 Running the Installation Verification Procedure

The Diskless Driver for Tru64 UNIX product does not use the Installation Verification Procedure (IVP). Successful installation indicates that the driver is installed.

3.2 Configuring Diskless Driver for Tru64 UNIX

After installing Diskless Driver for Tru64 UNIX, you must configure each client that will use remote paging. Log on to the client system as superuser and enter the following command:

```
# ddusetup
```

Follow these steps to configure each client system:

1. Choose menu option 1, Enable Diskless Driver subsystem.
2. Choose menu option 3, Configure Paging Files. Respond to prompts to enter a pagefile pathname and size. Compaq recommends that you create a directory for page files, for example, `/remote`. Do not use the pathnames `/dev/ddu0`, `/dev/ddu1`, `/dev/ddu2`, `/dev/ddu3`, `/dev/ddu4`, `/dev/ddu5`, `/dev/ddu6`, or `/dev/ddu7`.

   Repeat menu option 3 to add additional pagefiles if desired. Diskless Driver for Tru64 UNIX supports up to eight pagefiles.
3. If you have not previously started the Diskless Driver, you can choose menu option 4, Start Diskless Driver. Otherwise, your changes will take effect on the next reboot.
4. When you have finished configuring pagefiles, choose menu option 9, Exit. See Appendix A for a complete installation log file.

3.2 Configuring Diskless Driver for Tru64 UNIX

Removing Page Files

To remove a page file once added:

1. run `ddusetup`
2. Choose Configure paging files from the menu
3. Enter "" for the name of the pagefile you want to remove
4. Reboot the system

You can now delete the actual pagefile.

3.3 Disabling Local Paging

On systems with local paging files, the file `/sbin/swapdefault` is a soft link that points to the primary pagefile. When using the Diskless Driver without a local pagefile, the `swapdefault` file should be removed.

Systems with local paging files can specify a partition to which to page by adding an entry to the file `/etc/fstab`. Pagefile entries can be identified by the presence of the characters "sw" in the fourth field. When using the Diskless Driver without a local page file, the pagefile entries in `/etc/fstab` should be removed.

3.4 Adjusting the Number of DDU Worker Threads

DDU provides the ability to adjust the number of diskless driver worker threads, which may improve paging performance in some environments. You can change the value of the DDU *threads* parameter, which is contained in the file `/etc/sysconfigtab`. You modify `sysconfigtab` using the `sysconfigdb` facility, as described in the `sysconfigdb`(8) reference page. After modifying the file, you must reboot the system before the new options take effect.

Threads read and write data to the pagefiles in a synchronous manner. The number of available threads determines how many operations can occur concurrently. By default, four threads are created. The maximum number of threads allowed is 20. If the latency of accessing the system you are paging to is high, you should increase the quantity of threads available for paging. To do this, you specify a value for *threads* under the label `dkless:` in `sysconfigtab`.

For example, editing the following into `/etc/sysconfigtab` increases the number of available diskless worker threads to 10:

```
dkless:
    threads = 10
```

3.5 Boosting the System Pager Thread Priority

The system pager thread has a default priority in the low system thread range. You can boost the pager's priority toward the high end of the system thread range, making the pager more responsive, by setting the parameter *boost_pager_priority* to 1 in /etc/sysconfigtab. You modify sysconfigtab using the sysconfigdb facility, as described in the sysconfigdb(8) reference page. After modifying the file, you must reboot the system before the new options take effect.

Caution

The *boost_pager_priority* parameter should be used only in connection with the Diskless Driver for Tru64 UNIX. In any other operating environment, the parameter's value should remain at its default of 0.

Note

Beginning with Tru64 UNIX Version 5.1, the boost_pager_priority parameter resides in the vm subsystem. In earlier versions, the parameter resided in the Diskless Driver subsystem.

To boost the system pager's priority in a diskless environment under Tru64 UNIX Version 5.1 or higher, add the following to sysconfigtab:

```
vm:
    boost_pager_priority = 1
```

To boost the system pager's priority in a diskless environment under earlier versions of Tru64 UNIX, add the following to sysconfigtab:

```
dkless:
    boost_pager_priority = 1
```

3.6 Tuning the Virtual Memory Subsystem for Diskless Systems

You can tune the virtual memory (VM) subsystem to improve paging performance in a diskless environment. In addition to the system pager thread priority discussed in Section 3.5, you can adjust the VM free page parameters, which also are contained in the file /etc/sysconfigtab. You modify sysconfigtab using the sysconfigdb facility, as described in the

3.6 Tuning the Virtual Memory Subsystem for Diskless Systems

sysconfigdb(8) reference page. After modifying the file, you must reboot the system before the new options take effect.

Paging over the network is not as responsive as paging locally to disk. To prevent stalling for pages, or possible resource deadlocks, the free page list should be larger than on locally-paging systems.

The threshold at which paging occurs is *vm-page-free-min*. When the number of free pages drops below *vm-page-free-min*, the system transfers data in memory to the pagefiles until the number of pages indicated by *vm-page-free-target* is reached.

If the applications running on your systems do not request large allocations of memory (that is, multiple Mbyte allocations in short periods of time), you can decrease the *vm-page-free-xxx* values. If the applications perform intensive large memory allocations, you should increase the *vm-page-free-xxx* values.

For example, if you want to start paging when 1 MB of memory is free and continue paging until 2 MB is available, add the following to sysconfigtab:

```
vm:
    vm_page_free_min = 128
    vm_page_free_target = 256
```

3.7 Deleting Diskless Driver for Tru64 UNIX from Your System

If you must remove a version of Diskless Driver for Tru64 UNIX from your system, delete each subset that you previously installed.

To delete subsets:

1. Log in as superuser (login name root).
2. Make sure you are at the root directory (/) by entering the following command:

   # **cd /**
3. Enter the following form of the setld command:

   # **setld -i | grep "DDU"**
4. Look for the word "installed" in the listing produced, and then delete the installed subsets. For example:

   # **setld -d DDUBASE*nnn* DDUDOC*nnn***

3.8 Displaying Documentation from CD–ROM

The Diskless Driver for Tru64 UNIX documentation is provided on the Tru64 UNIX online documentation CD–ROM in Adobe Acrobat (.pdf) file format. You can display the Adobe Acrobat files on your workstation using the Adobe Acrobat Reader software. For information on accessing and displaying these files, see the *Tru64 UNIX Layered Products Disc User's Guide*.

A

Sample Listings

This appendix provides sample listings for the following procedures:

- An installation of Diskless Driver for Tru64 UNIX using the `setld` command
- An installation of Diskless Driver for Tru64 UNIX using `dmu`, the Dataless Management Utility
- A sample client configuration

A.1 Sample Diskless Driver Installation Using the setld Command

```
# setld -l /mnt/ddu202/kit

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.

     1) Diskless Driver for Tru64 UNIX (V2.0B Rev 202)
     2) Diskless Driver for Tru64 UNIX Documentation (V2.0B Rev 202)

Or you may choose one of the following options:

     3) ALL of the above
     4) CANCEL selections and redisplay menus
     5) EXIT without installing any subsets

Estimated free diskspace(MB) in root:34.6 usr:128.4

Enter your choices or press RETURN to redisplay menus.

Choices (for example, 1 2 4-6): 3

You are installing the following optional subsets:

        Diskless Driver for Tru64 UNIX (V2.0B Rev 202)
        Diskless Driver for Tru64 UNIX Documentation (V2.0B Rev 202)

Estimated free diskspace(MB) in root:34.6 usr:127.8
```

A.1 Sample Diskless Driver Installation Using the setld Command

```
Is this correct? (y/n): y

Checking file system space required to install selected subsets:

File system space checked OK.

2 subsets will be installed.

Loading subset 1 of 2 ...

Diskless Driver for Tru64 UNIX (V2.0B Rev 202)
   Copying from /mnt/ddu202/kit (disk)
   Verifying

Loading subset 2 of 2 ...

Diskless Driver for Tru64 UNIX Documentation (V2.0B Rev 202)
   Copying from /mnt/ddu202/kit (disk)
   Verifying

2 of 2 subsets installed successfully.

Configuring "Diskless Driver for Tru64 UNIX (V2.0B Rev 202)" (DDUBASE202)

Configuring "Diskless Driver for Tru64 UNIX Documentation (V2.0B Rev 202)" (DDUDOC202)
#
```

A.2 Sample Diskless Driver Installation Using the dmu Utility

```
# dmu

*** DMU Main Menu ***

Choices without key letters are not available.

     ) ADD a client
    c) CONFIGURE software environments
    d) DELETE software environments
    i) INSTALL software environments
     ) LIST registered clients
     ) MODIFY a client
     ) REMOVE a client
    s) SHOW software environments
    x) EXIT

Enter your choice: i

DMU Software Installation Menu:

    1)  Install software into a new area
    2)  Add software into an existing area
    3)  Perform configuration phase on an existing area
    4)  Return to previous menu

Enter your choice: 2

You have chosen to add a product to an existing environment.

The existing environment is /usr/projects3/dms/dms0.alpha.
```

A.2 Sample Diskless Driver Installation Using the dmu Utility

```
Enter the device special file name or the path of the directory where
the software is located (for example, /mnt/ALPHA/BASE): /mnt/ddu202/kit

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.

     1) Diskless Driver for Tru64 UNIX (V2.0B Rev 202)
     2) Diskless Driver for Tru64 UNIX Documentation (V2.0B Rev 202)

Or you may choose one of the following options:

     3) ALL of the above
     4) CANCEL selections and redisplay menus
     5) EXIT without installing any subsets

Enter your choices or press RETURN to redisplay menus.

Choices (for example, 1 2 4-6): 3

You are installing the following optional subsets:

        Diskless Driver for Tru64 UNIX (V2.0B Rev 202)
        Diskless Driver for Tru64 UNIX Documentation (V2.0B Rev 202)

Is this correct? (y/n): y

Checking file system space required to install selected subsets:

File system space checked OK.

2 subsets will be installed.

Loading subset 1 of 2 ...

Diskless Driver for Tru64 UNIX (V2.0B Rev 202)
   Copying from /mnt/ddu202/kit (disk)
   Verifying

Loading subset 2 of 2 ...

Diskless Driver for Tru64 UNIX Documentation (V2.0B Rev 202)
   Copying from /mnt/ddu202/kit (disk)
        Working....Tue May 30 16:00:11 EDT 2000
   Verifying

2 of 2 subsets installed successfully.

*** DMU Main Menu ***

Choices without key letters are not available.
```

A.2 Sample Diskless Driver Installation Using the dmu Utility

```
     ) ADD a client
    c) CONFIGURE software environments
    d) DELETE software environments
    i) INSTALL software environments
     ) LIST registered clients
     ) MODIFY a client
     ) REMOVE a client
    s) SHOW software environments
    x) EXIT

Enter your choice: c

You have chosen to configure an existing dataless environment.

The existing environment is /usr/projects3/dms/dms0.alpha.

There are several files prefixed by .proto.. within the environment area
that should be modified before performing a configuration of the area.
Performing this customization of the environment before you register clients
will reduce the amount of customization required at each client.

You may now choose to continue with the configuration or return to
the main menu and exit to perform customization of the environment.

Do you want to (c)ontinue or (r)eturn to the main menu? (c/r) [c]:

Configuring "Base System" (OSFBASE505)

Configuring "Compiler Back End" (OSFCMPLRS505)

Configuring "Kernel Header and Common Files" (OSFBINCOM505)

Configuring "Basic X Environment" (OSFX11505)

Configuring "Tcl Commands" (OSFTCLBASE505)

Configuring "Tk Toolkit Commands" (OSFTKBASE505)

Configuring "Basic Networking Services" (OSFCLINET505)

Configuring "Additional Networking Services" (OSFINET505)

Configuring "Dataless Management Services" (OSFDMS505)

Configuring "Netscape Communicator V4.7" (OSFNETSCAPE505)

Configuring "X Servers Base" (OSFSER505)

Configuring "X Servers for TurboChannel" (OSFSERTC505)

Configuring "X Servers for PCbus" (OSFSERPC505)

Configuring "X Fonts" (OSFMITFONT505)

Configuring "PCXAL Keyboard Support" (OSFKBDPCXAL505)

Configuring "LK444 Keyboard Support" (OSFKBDLK444505)

Configuring "LK421 Keyboard Support" (OSFKBDLK421505)

Configuring "LK411 Keyboard Support" (OSFKBDLK411505)
```

A.2 Sample Diskless Driver Installation Using the dmu Utility

```
Configuring "LK401 Keyboard Support" (OSFKBDLK401505)
Configuring "LK201 Keyboard Support" (OSFKBDLK201505)
Configuring "DECwindows 75dpi Fonts" (OSFFONT505)
Configuring "DECwindows 100dpi Fonts" (OSFFONT15505)
Configuring "NFS(tm) Utilities" (OSFNFS505)
Configuring "CDE Minimum Runtime Environment" (OSFCDEMIN505)
Configuring "CDE Desktop Environment" (OSFCDEDT505)
Configuring "Doc. Preparation Tools" (OSFDCMT505)
Configuring "Service Tools" (OSFSERVICETOOLS505)
Configuring "Base System Management Applications and Utilities" (OSFSYSMAN505)
Configuring "NFS(tm) Configuration Application" (OSFNFSCONF505)
Configuring "Java 1.1.7B-6 Environment" (OSFJAVA505)
Configuring "Insight Manager" (OSFIMXE505)
Configuring "Graphical Base System Management Utilities" (OSFXSYSMAN505)
Configuring "Graphical System Administration Utilities" (OSFXADMIN505)
Configuring "Local Printer Support" (OSFPRINT505)
Configuring "Graphical Print Configuration Application" (OSFXPRINT505)
Configuring "Basic Networking Configuration Applications" (OSFNETCONF505)
Configuring "CDE Mail Interface" (OSFCDEMAIL505)
Configuring "Standard Kernel Modules" (OSFBIN505)
Configuring "Logical Storage Manager Kernel Modules" (OSFLSMBIN505)
Configuring "Hardware Kernel Header and Common Files" (OSFHWBINCOM505)
Configuring "Hardware Kernel Modules" (OSFHWBIN505)
Configuring "AdvFS Kernel Modules" (OSFADVFSBIN505)
Configuring "Base System - Hardware Support" (OSFHWBASE505)
Configuring "Diskless Driver for Tru64 UNIX (V2.0B Rev 202)" (DDUBASE202)
Configuring "Diskless Driver for Tru64 UNIX Documentation (V2.0B Rev 202)" (DDUDOC202)
*** DMU Main Menu ***
Choices without key letters are not available.
```

A.2 Sample Diskless Driver Installation Using the dmu Utility

```
    a) ADD a client
    c) CONFIGURE software environments
    d) DELETE software environments
    i) INSTALL software environments
     ) LIST registered clients
     ) MODIFY a client
     ) REMOVE a client
    s) SHOW software environments
    x) EXIT

Enter your choice: x
#
```

A.3 Sample Client Configuration

```
# mkdir /var/page
# ddusetup

                        Diskless Driver Setup

        1) Enable Diskless Driver subsystem

        2) Disable Diskless Driver subsystem

        3) Configure Paging Files

        4) Start Diskless Driver

        9) Exit

Enter the menu item number that you want: 1

                         Enable Diskless Driver

Diskless Driver support allows a system that has no local disks to
swap/page to a file on a remote system.

Do you want to enable the Diskless Driver on this system? [Y/N] y

The Diskless Driver subsystem has been added to your system
and will be reloaded each time the system boots.

Press RETURN when ready to continue.

                        Diskless Driver Setup

        1) Enable Diskless Driver subsystem

        2) Disable Diskless Driver subsystem

        3) Configure Paging Files

        4) Start Diskless Driver

        9) Exit

Enter the menu item number that you want: 3
```

A.3 Sample Client Configuration

```
                    Configure Paging Files

The following table shows the relationship between the psuedo
device /dev/ddu?c and the file that will be used for paging.
This data is stored in /etc/sysconfigtab.

        /dev/ddu0c = ""
        /dev/ddu1c = ""
        /dev/ddu2c = ""
        /dev/ddu3c = ""
        /dev/ddu4c = ""
        /dev/ddu5c = ""
        /dev/ddu6c = ""
        /dev/ddu7c = ""

Would you like to modify this data? [Y/N] y
Which device number should be modified? (0-7) (q to quit) 0
What is the new file for device 0? ("" to delete entry) /var/page/swap0
File does not exist, will be created.
What is the desired size of the paging file in Kbytes? 20000
.................
pagefile0: reconfigured
The pagefile has been created, press RETURN when ready to continue.

                    Configure Paging Files

The following table shows the relationship between the psuedo
device /dev/ddu?c and the file that will be used for paging.
This data is stored in /etc/sysconfigtab.

        /dev/ddu0c = /var/page/swap0
        /dev/ddu1c = ""
        /dev/ddu2c = ""
        /dev/ddu3c = ""
        /dev/ddu4c = ""
        /dev/ddu5c = ""
        /dev/ddu6c = ""
        /dev/ddu7c = ""

Would you like to modify this data? [Y/N] y
Which device number should be modified? (0-7) (q to quit) 1
What is the new file for device 1? ("" to delete entry) /var/page/swap1
File does not exist, will be created.
What is the desired size of the paging file in Kbytes? 20000
.................
pagefile1: reconfigured
The pagefile has been created, press RETURN when ready to continue.

                    Configure Paging Files
```

A.3 Sample Client Configuration

```
The following table shows the relationship between the psuedo
device /dev/ddu?c and the file that will be used for paging.
This data is stored in /etc/sysconfigtab.

        /dev/ddu0c = /var/page/swap0
        /dev/ddu1c = /var/page/swap1
        /dev/ddu2c = ""
        /dev/ddu3c = ""
        /dev/ddu4c = ""
        /dev/ddu5c = ""
        /dev/ddu6c = ""
        /dev/ddu7c = ""

Would you like to modify this data? [Y/N] y
Which device number should be modified? (0-7) (q to quit) 2
What is the new file for device 2? ("" to delete entry) /var/page/swap2
File does not exist, will be created.
What is the desired size of the paging file in Kbytes? 20000
.....................
pagefile2: reconfigured
The pagefile has been created, press RETURN when ready to continue.

                      Configure Paging Files

The following table shows the relationship between the psuedo
device /dev/ddu?c and the file that will be used for paging.
This data is stored in /etc/sysconfigtab.

        /dev/ddu0c = /var/page/swap0
        /dev/ddu1c = /var/page/swap1
        /dev/ddu2c = /var/page/swap2
        /dev/ddu3c = ""
        /dev/ddu4c = ""
        /dev/ddu5c = ""
        /dev/ddu6c = ""
        /dev/ddu7c = ""

Would you like to modify this data? [Y/N] n

                        Diskless Driver Setup

        1) Enable Diskless Driver subsystem

        2) Disable Diskless Driver subsystem

        3) Configure Paging Files

        4) Start Diskless Driver

        9) Exit

Enter the menu item number that you want: 4

                         Start the Diskless Driver
```

A.3 Sample Client Configuration

```
The DDU script that runs at boot time can be invoked at this time,
doing so will start paging to configured remote pagefiles.

Do you want to start the Diskless Driver? [Y/N] y
Invoking DDU startup script...
Diskless Driver - swapping starting on: /var/page/swap0
Diskless Driver - swapping starting on: /var/page/swap1
Diskless Driver - swapping starting on: /var/page/swap2

Press RETURN when ready to continue.

                        Diskless Driver Setup

        1) Enable Diskless Driver subsystem

        2) Disable Diskless Driver subsystem

        3) Configure Paging Files

        4) Start Diskless Driver

        9) Exit

Enter the menu item number that you want: 9
# swapon -s
Swap partition /dev/disk/dsk0b (default swap):
    Allocated space:        16384 pages (128MB)
    In-use space:             116 pages (  0%)
    Free space:             16268 pages ( 99%)

Swap partition /dev/ddu0c:
    Allocated space:         2500 pages ( 19MB)
    In-use space:               1 pages (  0%)
    Free space:              2499 pages ( 99%)

Swap partition /dev/ddu1c:
    Allocated space:         2500 pages ( 19MB)
    In-use space:               1 pages (  0%)
    Free space:              2499 pages ( 99%)

Swap partition /dev/ddu2c:
    Allocated space:         2500 pages ( 19MB)
    In-use space:               1 pages (  0%)
    Free space:              2499 pages ( 99%)


Total swap allocation:
    Allocated space:        23884 pages (186.59MB)
    Reserved space:         12612 pages ( 52%)
    In-use space:             119 pages (  0%)
    Available space:        11272 pages ( 47%)
#
```

B

Recovering from Errors

This appendix provides information to help you deal with failures or errors that might occur during product installation or product use.

If you find an error in the documentation, fill out and submit one of the Reader's Comments forms at the back of the document that contains the error. Include the section and page number where the error occurred.

B.1 Failures During Product Installation

If errors occur during the installation, the system displays failure messages. For example, if the installation fails due to insufficient disk space, the following message appears:

```
There is not enough space for subset DDUBASE202.
Diskless Driver for Tru64 UNIX DDUBASE202 will not be loaded.
```

Errors can occur during the installation if any of the following conditions exist:

- The operating system version is incorrect.
- The prerequisite software version is incorrect.
- There is insufficient disk space.
- The system parameter values for successful installation are insufficient.

For descriptions of error messages generated by these conditions, see the Tru64 UNIX documentation on system messages, recovery procedures, and Tru64 UNIX software installation. For information on system software requirements, see Section 1.4.3.

B.2 Failures During Product Use

Boot failure

If the target system appears to be configured correctly but fails on boot, it could be because the system name is too long. On the DMS server in the file `/etc/bootptab`, find the record for the target system. The length of the "rp" and "rf" strings together should not exceed 48 characters. If they do, try shortening the target node name; for example, you could shorten "mysys.brown.dec.com" to "mysys".

Difficulty creating page files before paging is available

The creation of page files can consume considerable memory. It is possible to run short of memory when creating page files during DDU setup before DDU paging has been enabled. If you encounter a memory shortage, consider creating a small page file (5-10 MB) and turning on DDU. This will allow the system to page while creating the larger paging files.

B.3 Reporting Problems

If an error occurs while Diskless Driver for Tru64 UNIX is in use and you believe the error is caused by a problem with the product, take one of the following actions:

- If you have a Software Product Services Support Agreement, contact your Customer Support Center (CSC) by telephone or by using the electronic means provided with your support agreement (such as DSNlink). The CSC provides telephone support for high-level advisory and remedial assistance. When you initially contact the CSC, indicate the following:
  - The name and version number of the operating system you are using
  - The version number of Diskless Driver for Tru64 UNIX you are using
  - The hardware system you are using (such as a model number)
  - A brief description of the problem (one sentence if possible)
  - How critical the problem is
- If you have a Self-Maintenance Software Agreement, you can submit a Software Performance Report (SPR).
- If you do not have any type of software services support agreement and you purchased Diskless Driver for Tru64 UNIX within the past year, you can submit an SPR if you think the problem is caused by a software error.

B.3 Reporting Problems

When you submit an SPR, take the following steps:

1. Describe as accurately as possible the circumstances and state of the system when the problem occurred. Include the description and version number of the Diskless Driver for Tru64 UNIX being used. Demonstrate the problem with specific examples.
2. Reduce the problem to as small a size as possible.
3. Remember to include listings of any command files, INCLUDE files, or relevant data files, and so forth.
4. Provide a listing of the program.
5. If the program is longer than 50 lines, submit a copy of it on machine-readable media (floppy diskette or magnetic tape). If necessary, also submit a copy of the program library used to build the application.

   For information about submitting media, see the `tar`(1) reference page.
6. Report only one problem per SPR. This will facilitate a faster response.
7. Mail the SPR package to Compaq.

If the problem is related to Diskless Driver for Tru64 UNIX documentation, you can do one of the following:

- Report the problem to the CSC (if you have a Software Product Services Support Agreement and the problem is severe).
- Fill out the Reader's Comments form (in the back of the document that contains the error) and send the form to Compaq. Be sure to include the section and page number where the error occurred.

Index