

DEC OSF/1

Installation Guide

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This guide describes the update installation process and the basic and advanced installation procedures for a full installation. It also describes the standalone environment for the DEC OSF/1 operating system on all supported processors.

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About This Guide

This guide describes the procedures for installing Version 3.2 of the DEC OSF/1 Operating System on all supported processors. It describes how to prepare your system for installation, how to boot the processor from the distribution media, and how to perform the installation procedure. This guide also explains how to work in the standalone environment.

In DEC OSF/1 Version 3.2 you can use the update installation procedure to update from DEC OSF/1 Version 3.0 and Version 3.0B to Version 3.2. The `installupdate` procedure upgrades your system and preserves many of your system customizations and configurations.

If your system comes with Factory-Installed Software (FIS), the subsets necessary to get your system up and running are installed at the factory. Follow the instructions for entering system information in the *FIS Quick Reference Card* delivered with your system, and then refer to Chapter 6 in this guide for instructions on how to configure and set up your system.

Audience

This book is intended for anyone installing the DEC OSF/1 Operating System software. Before proceeding with an installation you must:

- Read the documentation supplied with your processor
- Read the current version of the DEC OSF/1 *Release Notes*
- Understand how to load and unload the installation media and know which disks are needed during the installation
- Know the names and unit numbers of your disk devices
- Have a basic understanding of the file system and commands

Organization

This guide is organized as follows:

- | | |
|-----------|---|
| Chapter 1 | Describes the tasks you must complete before beginning an installation. This chapter also describes the different installation options. |
|-----------|---|

Chapter 2	Explains how to perform an update installation.
Chapter 3	Describes the disk space planning you should complete before beginning an advanced installation.
Chapter 4	Describes how to boot each supported DEC OSF/1 processor.
Chapter 5	Describes how to perform a basic or advanced full installation.
Chapter 6	Describes how to configure and set up the system after installing the DEC OSF/1 Operating System software.
Chapter 7	Describes the standalone environment
Chapter 8	Provides information on using the <code>setld</code> command to install software subsets at any time after the installation.
Appendix A	Describes how to load a DEC OSF/1 CD-ROM into a caddy and a drive, how to mount and unmount a CD-ROM, and how to remove a CD-ROM from a drive and a caddy.
Appendix B	Provides a description of each DEC OSF/1 base software subset.
Appendix C	Provides a description for each DEC OSF/1 additional software subset.
Appendix D	Provides disk partition information for supported disks.
Appendix E	Explains installation error messages.
Appendix F	Provides a sample log file for the basic installation.
Appendix G	Provides a sample log file for the advanced installation.
Appendix H	Provides a sample configuration log file.
Appendix I	Provides a sample log file for the update installation.
Appendix J	Provides sample logs for the files saved or modified by the update installation.

Related Documentation

The printed version of the DEC OSF/1 documentation set is color coded to help specific audiences quickly find the books that meet their needs. (You can order the printed documentation from Digital.) This color coding is reinforced with the use of an icon on the spines of books. The following list

describes this convention:

Audience	Icon	Color Code
General Users	G	Teal
System Administrators	S	Red
Network Administrators	N	Yellow
Programmers	P	Blue
Reference Page Users	R	Black

Some books in the documentation set help meet the needs of several audiences. For example, the information in some system books is also used by programmers. Keep this in mind when searching for information on specific topics.

The *Documentation Overview* provides information on all of the books in the DEC OSF/1 documentation set.

Read the related documentation in the following order:

1. The documentation for your hardware shows how to set up the processor and its additional devices, and supplies valuable troubleshooting guidelines.
2. Before beginning the installation, read the current version of the DEC *OSF/1 Release Notes*.
3. Refer to *Sharing Software on a Local Area Network* for information about Remote Installation Services (RIS) and Dataless Management Services (DMS). RIS allows you to install software products over a network. DMS gives you the ability to set up a dataless management environment on a server system.
4. Refer to *System Administration* for information on administering and maintaining your system. This guide also contains information about the POLYCENTER Advanced File System (AdvFS).
5. Refer to *Network Configuration* for network setup information after you install the software subsets and configure a standalone system.
6. Refer to *Software License Management* for information on using the License Management Facility (LMF) to install software licenses from Digital Equipment Corporation.

Reader's Comments

Digital welcomes your comments on this or any other DEC OSF/1 manual. A Reader's Comment form is located in the back of each printed DEC OSF/1 manual and on line in the following location:

`/usr/doc/readers_comment.txt`

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If you have suggestions for improving particular sections or find any errors, please indicate the manual title, order number, and section numbers. Digital also welcomes general comments.

Conventions

- | | |
|---------------------------|---|
| <code>%</code> | A percent sign represents the C shell system prompt. A dollar sign represents the system prompt for the Bourne and Korn shells. |
| <code>\$</code> | |
| <code>#</code> | A number sign represents the superuser prompt. |
| <code>>>></code> | The console subsystem prompt is three right angle brackets. |
| <code>% cat</code> | Boldface type in interactive examples indicates typed user input. |
| <code><i>file</i></code> | Italic (slanted) type indicates variable values, placeholders, and function argument names. |
| <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>Ctrl/x</code> | 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, <code>Ctrl/c</code>). |

This chapter describes the following:

- The *three types of installations*
- How to prepare for an installation
- How to decide what type of installation to perform

1.1 Types of Installations

You can install the DEC OSF/1 software on your system either by using a CD-ROM optical disc containing the DEC OSF/1 software or by using the Remote Installation Services (RIS). A RIS installation uses the network to install software from a server that is established with RIS. Refer to *Sharing Software on a Local Area Network* for more information about remote installations.

In this version of DEC OSF/1, Version 3.2, you have the option to perform an update installation or a full installation (which has basic or advanced procedures). The following briefly describes these three types of installations:

- **Update Installation** - An update installation preserves the user files, data files, system configuration, and many of the customizations on your *current system* and updates DEC OSF/1 Version 3.0 or Version 3.0B to DEC OSF/1 Version 3.2. The update installation does not update optional layered products. Refer to Section 1.5.1 for more detailed information about the update installation process.
- **Basic installation** - A basic installation is a full installation that overwrites the existing `root`, `usr`, and `var` file systems and installs the mandatory base DEC OSF/1 software subsets on using the default disk layout and default partitions. Refer to Section 1.5.2 for more detailed information about the basic installation.
- **Advanced installation** - An advanced installation is a full installation that overwrites the existing `root`, `usr`, and `var` file systems. In addition to installing the mandatory base DEC OSF/1 software subsets, the advanced installation allows you to install optional software subsets to customize your system and to customize your file system layout. Refer to Section 1.5.3 for the other choices you have during an advanced installation.

A full installation (basic or advanced) affects many of the system files from the previous version of DEC OSF/1, and must be done if your system predates DEC OSF/1 Version 2.0.

The full installation procedure also provides a SYSTEM MANAGEMENT option called the *standalone environment*. This feature is described in Chapter 7. Digital recommends that only experienced users choose the SYSTEM MANAGEMENT option.

Section 1.2 summarizes the installation tasks for all installation types.

1.2 Summary of Installation Tasks

Table 1-1 summarizes the general procedures for performing a DEC OSF/1 installation for all supported processors for all three installation types:

Table 1-1: Summary of Installation Tasks

Installation Task	Which Installation? (Update/Basic/Advanced)	Follow Instructions In:
Perform hardware checks	All	Section 1.4
Check software kit	All	Section 1.4
Back up system	All	Section 1.4
Read the <i>Release Notes</i>	All	Section 1.4
Determine the type of installation to perform	All	Section 1.4
Update a DEC OSF/1 system to Version 3.2	Update	Chapter 2
Plan disk space and disk partitions	Advanced	Chapter 3
Shut down and boot the processor	Basic/Advanced	Chapter 4
Start full installation	Basic/Advanced	Chapter 5
Register and load software licenses	Basic/Advanced	Section 1.7 and Section 6.7

Table 1-1: (continued)

Installation Task	Which Installation? (Update/Basic/Advanced)	Follow Instructions In:
Configure and set up system for general use	All	Chapter 6

1.3 Factory Installed Software (FIS)

If you have a brand new system, it may have been delivered to you with factory installed software (FIS); that is, a version of DEC OSF/1 has already been installed for you. If this is the case, connect the hardware as shown in the hardware documentation, and turn on power to the processor and monitor. After some initial system initialization messages display, you will be prompted to enter information such as the system name, password, and the date and time. The *FIS Quick Reference Card* that is included in the box with your system tells you how to respond to the prompts for this information. Refer to Section 6.2 in this guide for information about set up your system for general use.

Under some circumstances, you may need to reinstall the DEC OSF/1 software subsets. This can happen if an error occurs during FIS setup or if you plan to install optional hard disks.

If the FIS setup halts unexpectedly and you see the # prompt, make a note of any error messages that appear on the screen.

Next, press `Ctrl/d` to restart the installation. Usually the installation continues, but you will need to correct the error when setup is complete. Consult the appropriate DEC OSF/1 document or system hardware document to identify and correct the error.

If the error prevents the installation from proceeding, it may be necessary to reinstall DEC OSF/1. To do this, boot your processor as shown in Chapter 4 and then follow the advanced installation procedure described in Chapter 5.

The disk on which the FIS was loaded may already have a customized partition table. If you are not an experienced DEC OSF/1 user, keep the existing disk label when you do the installation. This option is described in Section 5.6.3.

1.4 How to Prepare for an Installation

Before you begin the installation, complete the following steps:

1. Check the hardware needed for the installation

Ensure that you have the hardware needed for an installation. You must know the location and function of the controls and indicators on your hardware. You should also understand how to load and unload the installation media (CD-ROM) and know which disks are needed during the installation. Check the hardware to be sure it is working properly. Verify that all cables and connectors are hooked up and that the system is plugged in. Refer to your hardware documentation for more information.

You need some or all of the following hardware to install the DEC OSF/1 Operating System software:

- A software distribution device

You need a CD-ROM device to load the CD-ROM distribution media or kit (for example, an RRD42 or RRD43 optical disc drive). Refer to your hardware documentation for instructions on how to load media.

If you are installing from a RIS (Remote Installation Services) server, refer to *Sharing Software on a Local Area Network* about performing installations over a network.

- Ethernet, FDDI, or Token Ring for RIS installation

You need a connection to the network (via Ethernet, FDDI, or Token Ring) if you are going to do a network installation. Refer to your hardware installation guide for information.

- System disk (required)

You use the system disk to boot your system.

- Data disks (optional)

A data disk is a device on which you store data files. For a basic installation, you need only one hard disk to install the DEC OSF/1 Operating System. If you perform an advanced installation, you can choose to allocate certain file systems to disks other than the system disk.

- Console terminal (required)

You use the console terminal to communicate with your system during the installation. Depending on your system and its configuration, you can perform the installation at either a serial hard copy terminal, a serial video terminal, or at the console display if the system is a workstation.

2. Check the software distribution kit

Use the Part Listing to check your software distribution kit. The software distribution kit consists of two CD-ROM optical discs labeled *Disc 1* -

DEC OSF/1 Operating System V3.2 and Disc 2 - DEC OSF/1 Online Documentation V3.2. The documentation shipped with the kit includes this guide and the *Release Notes*.

3. Read the DEC OSF/1 *Release Notes*

The *Release Notes* document any last-minute changes to the software. This information might be required for a successful installation. The *Release Notes* also contain information about the disk space requirements. If your system has small disks, this information is important for planning the installation.

The *Release Notes* may also provide information about updating your system's firmware. Digital distributes console firmware for certain processors whenever the operating system is updated or as is required. The firmware update is packaged on a separate CD-ROM. Firmware updates for all supported processors reside on the firmware CD-ROM and the revision level may be different for each processor. The Firmware Update Utility is the mechanism provided to update the firmware. You should update your system's firmware before installing the latest version of DEC OSF/1. The *Alpha Systems Firmware Release Notes* provide instructions on how to use the Firmware Update Utility to update the firmware for your processor.

4. Back up your system

Before you begin any installation, Digital recommends that you back up your system to retain any information from your previous operating system. Refer to *System Administration* for information about backing up your system.

1.5 Determining the Type of Installation to Perform

After performing the prerequisite reading and checking your hardware and software distribution kit, decide on what type of installation you want to perform by reading the detailed information in Section 1.5.1, Section 1.5.2, and Section 1.5.3.

1.5.1 Description of an Update Installation

The `installupdate` program is an operating system update procedure that preserves disk partitions, file systems, and file customizations on a system already running DEC OSF/1.

This means that your system retains any special *customizations* – changes that you made to the version of DEC OSF/1 that is currently installed on your system. The amount of postinstallation administrative work after an update installation update is greatly reduced when compared to a full installation because the update installation preserves your print and network

configuration, your user accounts, and any other system setup you may have done.

Only the software subsets that are part of the DEC OSF/1 base system are updated. DEC OSF/1 base subset names start with OSF, and you can find them in the product area on the distribution media. For example, the product area on a RIS server typically exists in the `/var/adm/ris/risn.alpha` directory. The number *n* represents the number assigned to any one of the many RIS areas that may be installed on the RIS server. The product area on a CD-ROM typically exists in the `/ALPHA/BASE` directory.

During an update installation, you cannot select additional optional subsets. Additional optional subsets must be installed using `setld` when the update installation is complete.

The update installation will not affect any user files (files that you created that are not shipped as part of the DEC OSF/1 product). The files that the update installation will affect are:

- Protected System Files (files prefixed with `.new..`)
- Unprotected System Files
- Obsolete System Files

Chapter 2 contains more information about the system files affected by the update installation.

If you want to perform an update installation, all you have to do is to follow the instructions in Chapter 2.

1.5.2 Description of a Basic Installation

The basic installation lets you get your system running with a minimum amount of work because a basic installation uses preset defaults; you do not have to make any decisions.

The basic installation is designed for new users of the DEC OSF/1 Operating System. The installation process is simpler and takes a shorter time to accomplish. However, the installation is generic, installing only the mandatory software subset to provide you with a minimally configured system. You have no control over the allocation of file systems as you do during an advanced installation.

The basic installation provides a default file system layout. Disk space of 64 MB is allocated for the root file system on whatever disk you select for your system disk. The `b` partition of the same disk is used for dumps and contains the swap space. The `g` partition of the disk is used for the `/usr` and `/usr/var` file systems.

The basic installation loads the following mandatory subsets:

- Base System
- Base System - Hardware Support
- Compiler Back End
- Kernel Header and Common Files
- Standard Kernel Objects
- Hardware Kernel Objects
- Hardware Kernel Header and Common Files
- Basic Networking Services
- NFS(tm) Utilities

If Asynchronous Mode Transfer (ATM) hardware is detected during the installation process, the following subsets are also mandatory:

- ATM Kernel Objects
- ATM Commands

If you have a workstation, the following subsets are also mandatory:

- X Servers
- Basic X Environment
- X Fonts
- DECwindows 100dpi Fonts
- Adobe Fonts

For descriptions of the mandatory subsets, refer to Section B.1.

Optional subsets are part of the base system and can be installed using the `setld` utility after the basic installation is complete. Refer to Chapter 8 or *System Administration* for information about installing software subsets after the installation. For descriptions of the optional software subsets, refer to Section B.2.

There are additional software subsets that are not part of the base system but can be installed after the installation is complete. Refer to Appendix C for descriptions of the additional software subsets.

Choose the basic installation if *all* of the following conditions are true:

- You are not familiar with UNIX systems.
- You do not need to preserve custom partition tables or disk labels.
Custom partition tables are partition tables that have been changed to sizes other than the default values. The partition table is included in the disk label.
- You do not want to use the Advanced File System (AdvFS) as the file system type for `root`, `/usr`, or `/var`.
- You do not need to put the `/usr` file system on a disk other than the system disk.

- You do not need to allocate the `/usr` file system on a partition other than the `g` partition of the system disk.
- You do not need to allocate a separate `/var` file system.
- You do not need to allocate a second swap space. You can allocate a second swap space after the installation.
- You do not need to install optional software at this time. You can add optional software after the installation procedure completes.

If you want to perform a basic installation, start by booting your system as described in Chapter 4.

1.5.3 Description of an Advanced Installation

Choose the advanced installation only if you are experienced with UNIX file systems, and if you want to:

- Preserve custom partition tables or disk labels
 Custom partition tables are partition tables that are changed to sizes other than the defaults. The defaults are defined by the `/etc/disktab` file and are listed in Appendix D. Refer to Section 3.6 for information about modifying your disk partition layouts.
- Select file system layouts other than the default layouts.
- Allocate the `/usr` file system to any disk partition on your system
- Allocate the `/var` file system to the `/usr` file system or to any other disk partition on your system
- Choose either the UNIX File System (ufs) or the Advanced File System (AdvFS) as the file system type for the `root`, `/usr`, or `/var` file systems
- Allocate two swap areas to any unused disk partition on your system
- Install optional as well as mandatory software subsets.
- Select specific kernel options.
- Set up a dataless management environment on a server system

If you plan to install software on a Dataless Management Services (DMS) server, you must perform an advanced installation because you need more than just the mandatory software subsets on a DMS server. DMS client systems are not installed using the procedures documented in this book. The `dmu` utility is used to install software on DMS clients. Refer to *Sharing Software on a Local Area Network* for information about setting up disk partitions for DMS servers, software requirements for DMS servers, and installing software on DMS clients.

In the advanced installation, the required software subsets are automatically installed and you can choose to install some or all of the optional software subsets. Disk space of 64 MB is allocated for the root file system for all disks.

The advanced installation loads the following mandatory software subsets and provides you with a menu of optional software subsets:

- Base System
- Base System - Hardware Support
- Hardware Kernel Header and Common Files
- Hardware Kernel Objects
- Kernel Header and Common Files
- POLYCTR advfs Kernel Objects
- Standard Kernel Objects
- Basic Networking Services
- NFS(tm) Utilities
- Compiler Back End
- POLYCTR advfs

Note

The two POLYCTR software subsets are optional. They become mandatory only if AdvFS is chosen as the file system type for `root`, `/usr`, or `/var`.

The ATM Kernel Objects and ATM Command subsets become mandatory if the installation process detects ATM hardware.

The following mandatory software subsets are installed if you have a workstation:

- Adobe Fonts
- Basic X Environment
- DECwindows 100dpi Fonts
- X Fonts
- X Servers

For descriptions of the mandatory software subsets, refer to Section B.1.

Optional software subsets are part of the base system; they can be installed during the advanced installation or after the installation is complete. Refer to Chapter 8 or the *System Administration* guide for information on installing software subsets after the installation. For descriptions of the optional software subsets, refer to Section B.2.

You can install additional software subsets that are not part of the DEC OSF/1 Operating System after the base installation is complete. Refer to Appendix C for descriptions of the additional software subsets that you can install.

If you want to perform an advanced installation, start with Chapter 3. The worksheets in Chapter 3 help you plan disk space for your DEC OSF/1 file systems and whether or not you should use the default disk partitions or customize them.

1.6 System Management Option

When you start an installation, you can choose the SYSTEM MANAGEMENT option from the Installation menu. This option provides you with a Bourne shell in the standalone environment. The standalone environment is primitive, but supports the initial phases of an installation. If you intend to do an advanced installation, you may need to choose this option and run one or more utility programs. For example, if you have to customize disk partition tables after you complete the installation planning worksheets in Chapter 3, use the SYSTEM MANAGEMENT option to run the `disklabel` command.

The standalone environment also includes commands that you use to recover from root file system corruption. You can also perform limited file system and disk maintenance tasks. You should perform system management tasks in the standalone environment only if you have extensive DEC OSF/1 Operating System experience. Refer to Chapter 7 for more information about the standalone environment. Section 5.6.3.

1.7 Software Licensing

Product Authorization Keys (PAKs) are used to register a license for a product. PAKs are registered and loaded after the DEC OSF/1 software subsets are installed. To register and load the license PAKs for the DEC OSF/1 Operating System and other products, you must use the License Management Facility (LMF). Refer to *Software License Management* or Section 6.7.1 for information about using LMF to load your PAKs.

The OSF-BASE PAK must be registered before you can use DEC OSF/1. This PAK provides simultaneous login capacity for two users and allows you to access the online documentation. The user `root` does not count as an interactive operating system user.

The license for the DEC OSF/1 base system includes the right to use the operating system, windowing environment, basic Logical Storage Manager features, POLYCENTER Advanced File System, NetWorker SingleServer Save and Restore, and many other optionally-installed features included on the DEC OSF/1 CD-ROM.

The following additional licenses are available:

- DEC OSF/1 C Developer's Extensions

The DEC OSF/1 C Developer's Extensions license grants the right to use

the C compiler and software development tools for program development and debugging.

- DEC OSF/1 Developer's Toolkit

The DEC OSF/1 Developer's Toolkit license grants the right to use the software development tools for program development and debugging without the C compiler.

- DEC OSF/1 Server Extensions

The DEC OSF/1 Server Extensions license allows users to install the DEC OSF/1 Operating System over a Local Area Network (LAN) using the Remote Installation Services (RIS). The DEC OSF/1 Server Extensions license also allows access to Dataless Management Services (DMS).

- A separate license is required to use the Logical Storage Manager features of mirroring and striping and the LSM graphical user interface (GUI).

The C compiler, software development tools, and RIS components are supplied in the installation kit. Before using these components, you must purchase the appropriate license and load a Product Authorization Key (PAK), using the License Management Facility (LMF).

Any additional interactive user licenses must be loaded into the system using LMF. For information on using the `lmf` utility refer to the *Software License Management* guide and Section 6.7.1.

This chapter describes how to prepare for and perform an update installation. This chapter also explains the phases of the update installation and lists the post-installation tasks that you should perform.

2.1 What is an Update Installation?

In DEC OSF/1 Version 3.2, you have the option to perform an update installation procedure to update your DEC OSF/1 base system from Version 3.0 or Version 3.0B to Version 3.2. An update installation preserves disk partitions, file systems, and file customizations on an already running operating system. The update installation will not update optional layered products.

The update installation is performed from single-user mode. You must be superuser or `root` to bring a system down to single-user mode.

2.1.1 Files Affected by the Update Installation

The update installation will not affect any user files (files not shipped as part of the DEC OSF/1 Operating System). The files that the update installation affects are:

- Protected System Files (.new..)

An inspection of your system will show a number of files labeled with `.new..` prefixed to the file name. Examples of these files are listed in Section J.1 in Appendix J. These files are special to the DEC OSF/1 update installation. The `.new..` prefix allows the file to be delivered onto the system without overwriting the existing, and possibly customized, version of the file. One example of a protected file is the `/etc/hosts` file that is shipped as `/etc/.new..hosts`. The `/etc/hosts` file is considered the configured version of the file and typically contains customizations that were not present in the `/etc/.new..hosts` file. Only the configured version of protected system files should be customized. The `.new..` version of a file should never be customized.

Similar to the `.new..` prefix, the `.proto..` prefix also exists for all protected system files. Every `.new..` file has a corresponding `.proto..` file. The `.proto..` files have special significance for

Dataless Management Services (DMS) environments where a centralized server maintains the `root`, `/usr`, and `/var` file systems for client systems. The `.proto..` files allow dataless server System Administrators to provide site-wide customizations in the `.proto..` files before the configured versions are used by the server's dataless clients.

One of the main benefits of performing an update installation is that customizations to protected system files are preserved. The mechanism for preserving customizations is the merge process. The `installupdate` procedure can detect whether customizations have been made by comparing the existing `.new..` file against the configured version. If customizations have been made, new functionality is merged into the configured file.

It is important that you do not delete the `.new..` and `.proto..` versions of protected system files because they are crucial to the proper operation of the `installupdate` procedure.

- Unprotected System Files

The DEC OSF/1 update installation detects other customized system files that may be on your system that are not *merge protected* by the update installation. If any files of this type are detected during the update, they will be automatically saved as `filename.PreUPD` if disk space permits. As each file is saved it is recorded in the log file `/var/adm/smlogs/upd_custom_files`. You must manually merge your customizations into the new files when the update is complete.

When your manual merges are complete, you can use the utility `/usr/bin/updadmin` to perform administrative tasks on the saved file versions.

The `installupdate` procedure finds most of the changes to system files, not just the files that you deliberately modified. Some system files might be changed by a process, such as during the installation of a software application. Other system files might be changed as part of the normal system operation. For example, an empty log file becomes filled with data as the system runs.

- Obsolete System Files

Obsolete files are files that were shipped in the previous version of DEC OSF/1, but are no longer part of the DEC OSF/1 software. During an update installation you have an opportunity to save these obsolete files so that you can either archive them or delete them from the system.

2.2 Steps in an Update Installation

The steps involved in an update installation are:

- Checking the status of your system

Before you begin the installation, ensure that it is safe to begin the update. Gather the following information that is required to perform the update:

- System backup status
- Device names used in the update
- Disk space required for the update
- Network status for RIS updates
- Loading additional subsets (must be deferred to post-installation)

- Choosing installation media

You can choose whether you want to update your system from:

- CD-ROM media
- Remote Installation Services (RIS) server

- Responding to update installation dialog

The update installation procedure has eight different phases. You are required to enter data only during the first three phases. The phases of the update installation are:

- Verifying the system backup
- Checking for registered Product Authorization Keys (PAKs)
- Checking layered products
- Checking the system status
- Checking file conflicts
- Detecting unprotected customized files
- Loading and merging subsets
- Configuring and merging subsets
- Building the kernel

- Performing post-installation tasks

You may have to perform the following tasks after the update installation is finished:

- Check the installation logs
- Manually merge customizations

- Install additional software subsets
- Update your system's firmware.

The Update Administration Utility is also described in this chapter. You use this utility to perform file administration tasks at any time after the update installation is complete. Refer to Section 2.9 for more information about the Update Administration Utility.

2.3 Checking the Status of your System

This section describes any aspects of your current system that must be checked before you begin the update.

2.3.1 System Backup

Digital recommends that you back up your system before beginning an update installation. If there are any interruptions after the update is loading software subsets, it is unlikely that the update will complete successfully. Should this happen, you must restore the original version of the DEC OSF/1 software that was previously installed on your system before you can attempt another update. Consult *System Administration* for information about backing up your current system.

2.3.2 Device Names

If you plan to update your system from CD-ROM media, you will need to know the correct device name for the CD-ROM device where the media will be mounted. An example of a device name is `/dev/rz4c`.

If you are uncertain of your CD-ROM's device name, as the user `root` enter the `file` command, specifying the raw device, as follows:

```
# file /dev/rz*c
/dev/rrz1c: character special (8/1026) SCSI #0 RZ25 disk #8 (SCSI ID #1)
/dev/rrz2c: character special (8/2050) SCSI #0 RZ25 disk #16 (SCSI ID #2)
/dev/rrz3c: character special (8/3074) SCSI #0 RZ25 disk #24 (SCSI ID #3)
/dev/rrz4c: character special (8/4098) SCSI #0 RRD42 disk #32 (SCSI ID #4)
```

In the previous example, the CD-ROM device is the device named `RRD42`.

2.3.3 Disk Space

Refer to the *Release Notes* for information on the disk space requirements of DEC OSF/1 Version 3.2. Check your current disk usage using the `df` command. An update installation can be performed even if your disks are between 100% and 111% of capacity, although this is not recommended by Digital.

If your disk is already beyond 100% of capacity, consider using the `setld` utility to delete unwanted subsets before you begin the update. You should also remove all unnecessary core files and kernels that are wasting space. Refer to Chapter 8 for more information about `setld`.

Note

If you previously performed an update installation on your system, you should have used the Update Administration Utility to remove unnecessary files before attempting the next update installation. If you have not removed these files, please do so now. The Update Administration Utility allows you to remove obsolete files that may conflict with the newly loaded subsets. Removing obsolete files also frees-up disk space. Refer to Section 2.9 for more information about the Update Administration Utility.

2.3.4 Network Status

This section applies only to update installations from a Remote Installation Services (RIS) server. Refer to *Network Configuration* if you need more information about obtaining network status. Refer to *Sharing Software on a Local Area Network* if you need more information about RIS.

Ask the person responsible for server system administration to ensure that the full pathname for the RIS kit is exported to your client machine, for example: `/var/adm/ris/ris0.alpha/kit`. Another way to see the RIS server's exports list is to execute the following command:

```
/usr/bin/showmount -e RIS_hostname
```

The Internet name and address of the server may need to be in your system's `/etc/hosts` file. You can run `netsetup` to add the name and address of the server or edit the `/etc/hosts` file to include an entry for the server, similar to the following:

```
16.141.113.221 risky.lab.rad.com risky
```

The hosts entry in `/etc/svc.conf` must allow for *local* resolution of host (internet) addresses, for example: `hosts=local,yp`. You can run `svcsetup` to modify hosts to local or edit the `/etc/svc.conf` file.

2.3.5 OSF-BASE Product Authorization Key (PAK)

The OSF-BASE PAK is an availability PAK and must be registered (using the License Management Facility utility called `lmfsetup`) before you can use DEC OSF/1 Version 3.2. This PAK provides simultaneous login capacity for two users and allows access to the online documentation. The `root`

login does not count toward the two user capacity. OSF-BASE PAKs registered for Version 3.0 are valid for Version 3.2.

OSF-USR PAKs provide simultaneous login capacity for additional users above and beyond those provided by the OSF-BASE PAK. Other PAKs may have been included with your distribution kit and should also be registered.

You will be able to update install your system to DEC OSF/1 Version 3.2 without having the OSF-BASE PAK registered. However, you will only be allowed `root` login until an OSF-BASE PAK is registered. Once the update completes, refer to *Software License Management* or Section 6.7.1 of this guide for more information on registering PAKs.

2.4 Starting the Update Installation from CD-ROM

Read this section if you are using CD-ROM media. Complete the following steps:

1. Verify that your system is backed up so that you can recover the previous version if necessary. The *System Administration* guide documents backup procedures (using the `dump` command).
2. As superuser or `root`, boot to single-user mode or shut down your system. The following example shows how to switch to superuser and then shuts down the system:

```
# su -  
password:  
# shutdown +10 preparing to update the system
```

In the previous example, `+10` shuts down the system in ten minutes and sends the message `preparing to update the system` to all logged in users.

Note

If you are currently using the Logical Storage Manager (LSM), proceed to Step 3. If you are not using LSM, proceed to Step 4.

3. Follow this step only if you installed and are using LSM. Once the system is in single-user mode, enter the following command to activate LSM before running `bcheckrc` (in step 4):

```
# /sbin/lsmbootstrap
```

4. Once the system is in single-user mode, mount the local file systems as follows:

```
# /sbin/bcheckrc
```

The `bcheckrc` command also runs `fsck` to check the file system. If `fsck` finds a problem with the `root (/)` partition, the system shuts down and reboots to multiuser mode.

5. There are two ways to start `installupdate` depending upon how the CD-ROM is mounted:

- a. To run `installupdate` from a CD-ROM device, ensure that the CD-ROM is loaded in the caddy and drive as described in Appendix A. Enter the following command:

```
# installupdate <device>
```

In the previous example, `<device>` is the name of the CD-ROM device where the distribution volume for DEC OSF/1 Version 3.2 is mounted (such as `/dev/rz4c`).

- b. If you already have an instruction in your `/etc/fstab` file to mount the CD-ROM device, the distribution media is automatically mounted on the mount point that is specified in your existing `/etc/fstab` file. In that case, enter the following command to run `installupdate`:

```
# /sbin/installupdate <mnt-pt>
```

In the previous example, `<mnt-pt>` is the mount point specified in your `/etc/fstab` file.

Warning

Do not use `Ctrl/c` for any reason during the update. Using `Ctrl/c` will cause `installupdate` to abort. You must then restore the previous version of the DEC OSF/1 software before you can attempt another update.

Proceed to Section 2.6 which describes the installation dialog.

2.5 Starting the Update Installation from a RIS Server

Read this section if you are performing an update installation from a RIS server.

Ensure that the network is configured and that your system can communicate with the RIS server. Use the `ping` command to verify the network connection. Enter the `ping` command in the following format and replace

server with the name of your local RIS server:

```
# ping -c2 server
```

Your output will be similar to the following. In the example, *ma9* is the name of the RIS server:

```
# ping -c2 ma9
PING ma9 (16.59.124.96): 56 data bytes
64 bytes from 16.59.124.96: icmp_seq=0 ttl=255 time=1 ms
64 bytes from 16.59.124.96: icmp_seq=1 ttl=255 time=0 ms
```

```
----ma9 PING Statistics----
```

```
2 packets transmitted, 2 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 0/0/1 ms
```

Make sure that the optional subset OSFINET300 (Additional Networking Services) is installed on your system. This subset contains the *named* file, the Internet domain name server, that *installupdate* requires for RIS operation. To determine whether or not OSFINET300 is installed, enter the following command as superuser:

```
# setld -i | grep OSFINET
```

If OSFINET300 is installed, the following message should appear:

```
OSFINET      installed      Additional Networking Services
              (Network-Server/Communications)
```

If OSFINET300 is not installed, use the *setld* command to load this subset. Chapter 8 describes how to use the *setld* command.

Your RIS administrator must ensure that your system is registered as a RIS client and is able to access the DEC OSF/1 Version 3.2 RIS kit. Perform the following steps to update your system:

1. Verify that your system is backed up so that you can recover the previous version if necessary.
2. As superuser or *root*, boot to single-user mode or shut down your system. The following example shows how to switch to superuser and then shuts down the system:

```
# su -
password:
# shutdown +10 preparing to update the system
```

In the previous example, *+10* shuts down the system in ten minutes and sends the message *preparing to update the system* to all logged in users.

Note

If you are currently using the Logical Storage Manager (LSM), proceed to Step 3. If you are not using LSM, proceed to Step 4.

3. Follow this step only if you installed and are using LSM. Once the system is in single-user mode, enter the following command to activate LSM before running `bcheckrc` (in step 4):

```
# /sbin/lsmbootstrap
```

4. Once in single-user mode, mount the local file systems as follows:

```
# /sbin/bcheckrc
```

To run `installupdate` from a RIS server, enter the following command:

```
# /sbin/installupdate server:
```

Replace `server:` with the name of your local RIS server. The server name must be appended with a colon (:).

Warning

Do not use `Ctrl/c` for any reason during the update. Using `Ctrl/c` will cause `installupdate` to abort. You must then restore the previous version of the DEC OSF/1 software before you can attempt another update.

Proceed to Section 2.6 which describes the installation dialog.

2.6 Responding to the Update Installation Dialog

This section describes the information and prompts that are displayed during the update installation.

The update installation procedure may take from 60 to 90 minutes. The number of subsets loaded and the type of installation media used also affects the time required for an update. If there are no errors during the update, you are required to enter information only once during the early phases of the update. You do not need to monitor the update. However, if an error occurs, a message notifies you and offers options for proceeding.

The following sections describe the information displayed on your screen during the update.

Warning

You cannot use Ctrl/c to terminate the update. If you use Ctrl/c, you must reinstall the version of DEC OSF/1 that was originally on your system before you can update to DEC OSF/1 Version 3.2.

2.6.1 Verifying the System Backup

The first message displayed on your screen confirms the new version, and the version that you are updating from. This message also reminds you that your system should be backed up so that you can recover the current version of the system if an interrupt should occur.

The DEC OSF/1 Version 3.2 (Rev. xxx) Update Installation will update the following DEC OSF/1 products:

```
DEC OSF/1 V3.0
DEC OSF/1 V3.0B
```

Digital Equipment Corporation recommends that you perform complete system software backups before proceeding.

At this point, the update procedure also checks for certain applications that may be incompatible with update installations. If these products are found on your system, warning messages are displayed as described in Section 2.6.3. If the layered product messages are not displayed, and you are satisfied with the state of your system backup, you can proceed with the update. A prompt is displayed as follows:

```
Do you want to continue the update installation? (y/n) [n]:
```

Enter y to proceed with the installation or n if you want to exit and back up your system.

2.6.2 Checking for OSF-BASE PAK

The install update procedure checks for the existence of a valid registered OSF-BASE PAK. If none is found, the following warning message is displayed:

```
WARNING: OSF-BASE PAK not installed. The OSF-BASE PAK
must be registered before you can use DEC OSF/1 V3.2 (Rev. xxx).
After the update installation completes, refer to the License
Management Facility (LMF) section in the Installation Guide for
information about registering PAKs.
```

As mentioned in Section 2.3.5, you can proceed with the update installation if a valid OSF-BASE PAK is not registered. However, when the update completes, you must register the appropriate PAKs via LMF to use DEC OSF/1 Version 3.2.

2.6.3 Checking for Layered Products

Read this section if the layered product messages display as described in Section 2.6.1.

For DEC OSF/1 Version 3.2, `installupdate` checks whether certain software applications are installed on your system. If detected, these applications may be affected by the update as follows:

- Some applications operate correctly after an update. However, if you see a warning about these applications, you should test the application after the update is complete.
- Some applications must be removed before the update can proceed.

If `installupdate` detects any applications that may affect the update, messages are displayed as follows:

1. If any applications currently installed on your system require reinstallation, a message similar to the following is displayed:

```
-----  
The following layered products may require re-installation after  
the update installation has completed:
```

```
Product A
```

```
.
```

```
.
```

```
Product Z
```

```
-----  
Press <RETURN> to review message again.
```

You have the option to exit from the installation procedure at this point. The following prompt is displayed:

```
Do you want to continue the update installation? (y/n) [n]:
```

Enter `y` to proceed with the update installation or `n` if you want to exit the update installation and remove the applications before restarting the update.

If you decide to proceed without removing these applications, test the applications when the update is finished. Digital recommends that you reinstall any applications that are critical to your use of the updated system.

2. If applications or layered products installed on your system prevent the use of `installupdate`, a message similar to the following is displayed:

```
-----  
This system cannot be updated with the following layered products  
installed on it. Please remove these products from your system  
before attempting an update installation:
```


Product A

·
·
·

Product Z

Press <RETURN> to review message again.

Either one or both of the previous messages may be displayed, but the second message takes precedence. If the second message appears, the installation cannot proceed and you must exit at the following prompt:

Enter any character and press Return to stop:

If you enter a character and press Return, your system is returned to its original state, that is, the state your system was in before the update procedure.

You must delete the application that is preventing the update installation from continuing. First, use the `setld -i` command to determine the correct subset name(s) to delete. Next, use the `setld -d` command to delete the subset(s). In the following example, assume that DECnet prevented the update installation from continuing. The example shows how to determine the subset name(s) associated with DECnet and then how to delete them. Your output will be similar to the following:

```
# setld -i | grep -i decnet
DNABASE300      installed      DECnet/OSI Base Components
                  (DECnet/OSI Standard Run-time
                  Environment)
DNADLI300       installed      DECnet/OSI Datalink Components
                  (DECnet/OSI Standard Run-time
                  Environment)
DNAINETGW300    DECnet-Internet Gateway (Optional
                  DECnet/OSI Components)
DNAMAN300       DECnet/OSI Reference Pages
                  (Optional DECnet/OSI Components)
DNAMOP300       installed      DECnet/OSI MOP Utilities (Optional
                  DECnet/OSI Components)
DNANETMAN300    installed      DECnet/OSI Network Management
                  (DECnet/OSI Standard Run-time
                  Environment)
DNAPGMR300      DECnet/OSI Programming Tools
                  (Optional DECnet/OSI Components)
DNARFC1006300   DECnet/OSI RFC1006 (OSI/TCP)
                  (Optional DECnet/OSI Components)
DNAUTIL300      DECnet/OSI Miscellaneous Software
                  (Optional DECnet/OSI Components)
```

The output of the `setld` command shows that DNABASE300, DNADLI300, DNAMOP300, and DNANETMAN300 are the installed DECnet subsets and should be deleted.

Enter the following command to delete these subsets:

```
# setld -d DNABASE300 DNADLI300 DNAMOP300 DNANETMAN300
```

After subset deletion is complete, restart the update installation by entering:

```
# /sbin/installupdate server:
```

When the update installation is complete, reinstall the correct version of the application that is compatible with DEC OSF/1 Version 3.2.

2.6.4 Checking the System Status

The next step in the update involves checking the system status and collecting data that is used in the update. This step takes up to 20 minutes, and you are not required to enter any data.

Your screen will display a series of messages similar to the following:

```
*****   Checking current state of system

Depending on the system configuration, this may take
up to 20 minutes...
Working...Tue Jan 03 14:14:09 EDT 1995
Working...Tue Jan 03 14:15:10 EDT 1995
Working...Tue Jan 03 14:17:29 EDT 1995
Working...Tue Jan 03 14:19:30 EDT 1995
Working...Tue Jan 03 14:21:29 EDT 1995
Working...Tue Jan 03 14:23:30 EDT 1995
```

During this phase of the update, the update procedure does the following:

- Makes a list of installed subsets. This list is used for selecting and loading DEC OSF/1 Version 3.2 subsets.
- Checks for file type conflicts. This is described in detail in Section 2.6.4.1.
- Makes a list of files that are obsolete in DEC OSF/1 Version 3.0 or Version 3.0B.
- Makes a list of system files that are customized.
- Runs `fitset` to ensure that there is adequate disk space for the updated subsets.

If no problems are detected during the checking phase, you do not need to enter any more information beyond this point. Proceed to Section 2.6.5 to continue the update installation process.

2.6.4.1 File Type Conflicts

In DEC OSF/1, system file types can be files, directories, symbolic links, block devices, or pipes. The update installation procedure expects to find system file types currently installed as they were shipped with the base system. The status of the file types is verified during the system status

check. For example, if a file is shipped as type symbolic link in Version 3.0 and is later changed to a type directory, when the same file name ships as type symbolic-link in Version 3.2, the update installation detects the difference and aborts. When file system types are modified as part of a system customization, the update installation cannot proceed. This is intended to preserve the integrity of the software product about to be installed.

Messages are displayed when file type conflicts are found. In the following example, `/usr/tmp` was shipped as a symbolic link and was changed to a directory:

The following directories on this system conflict with assigned file types originally shipped in the DEC OSF/1 Operating System. This can be caused, for example, if a symbolic link is replaced with a real directory.

These conflicts must be resolved before an update installation can be performed on this system. Additional file status information can be found in subset inventory files located in the `/usr/.smdb` directory.

For later review, this message is also logged in

```
/var/adm/smlogs/update.log
```

```
./usr/tmp should be Symbolic Link to ../var/tmp
```

The update procedure will exit and return the system to the state it was in prior to starting the procedure

You can review the list of file conflicts or exit as follows:

Press Return to review message again.
Enter any character and press Return, to exit:

When you exit from the update procedure, the following message is displayed:

```
Returning system to Pre-Update state...done  
Update Installation exiting.
```

You must resolve any conflicts shown in the message before you can restart the update installation. If you do not resolve the conflicts, you will not be able to perform an update installation.

2.6.4.2 Unprotected Customized File Detection

If `installupdate` detects any unprotected customized system files (as described in Section 2.1.1), an attempt is made to save them to a `.PreUPD` extension (for example, `custom_file.PreUPD`) so that you can decide what to do with them after the update is complete. If unprotected customized

system files are found, a message similar to the following is displayed:

```
*** Files with .PreUPD extensions detected ***
```

The Update Installation has detected files on this system with .PreUPD file name extensions. This could be the result of a previous update installation on this system. These files are in danger of being overwritten unless some action is taken to save them.

If you have already backed up your system, you can continue with the installation by answering 'y' to the question below.

If you have not backed up your system, or if you are unsure about what action you should take, answer 'n' to the question below and the system will return to the state it was in prior to invoking the update installation.

Do you want to continue the installation? (y/n) [n]:

If you enter y, the following message is displayed:

Continuing Update Installation....

```
Working....Tue Jan 03 14:24:29 EDT 1995
```

```
Working....Tue Jan 03 14:26:30 EDT 1995
```

If you enter n, the update installation procedure halts to give you the opportunity to back up your files.

If disk space limitations prohibit saving unprotected customized files, the Update Administration Utility is invoked automatically and gives you the option to view these files and save them to backup media. The file name of each unprotected customized file is also logged in the file `/var/adm/smlogs/upd_custom_files` as a reminder of the files that require recustomization.

Files that have been successfully saved to the .PreUPD extension are listed as such in the file `/var/adm/smlogs/upd_custom_files`.

The following message is displayed if customized files have been found and successfully saved:

```
Unprotected customized system files have been found on
this system and have been saved to 'filename.PreUPD'.
A listing of the files has been logged in
/var/adm/smlogs/upd_custom_files.
```

After the update installation has completed, use the Update Administration Utility (`/usr/sbin/updadmin`) to perform system administration tasks on these files.

The following dialog (from the Update Administration Utility) is displayed if customized files have been found but could not be saved due to disk space limitations:

```
***** Unprotected Customized System File Administration *****
```

There are unprotected customized versions of DEC OSF/1 system files currently installed on your system that are in danger of being overwritten by new DEC OSF/1 V3.2 (Rev. xxx) versions of the files.

These files are typically customized by users for projects they may be working on, or by layered product software implementation.

If you haven't already backed up your system, save these files to back up media at this time. You can restore these files back onto your system after the update installation has completed.

```
Unprotected Customized System File Admin Menu
```

```
-----  
q) Quit installation  
s) Save files  
v) View list of files  
x) Return to installation
```

```
Enter your choice:
```

The Update Administration Utility was invoked automatically. A menu shows the available options. The Update Administration Utility is described in Section 2.9. If you choose to continue with the update, the following message is displayed:

```
A listing of unprotected customized system files  
found by the Update Installation has been logged  
in /var/adm/smlogs/upd_custom_files.
```

```
After the update installation has completed, use the  
Update Administration Utility (/usr/sbin/updadmin)  
to perform system administration tasks on these files.
```

2.6.4.3 File Size Checks

The update installation procedure performs size checks to make sure that the list of new subsets will fit on your system. In your preparation stage before the update, you should have removed all unwanted core files, crash dumps, and extra kernels that may be wasting space.

If the update installation process determines that there is adequate space for all new subsets, no user interaction is required, and the process continues by loading the subsets. If the update installation determines that there is inadequate space for the loading of new subsets, it attempts to buy back space from saved unprotected customized files. If the amount of space it can buy back from removing saved copies of unprotected customized files is less

than the space it needs to load new subsets, it displays a message similar to the following:

```
-----  
file system /usr needs 9555 Kbytes more to install the software  
specified.  
-----
```

The DEC OSF/1 Version 3.2 Update Installation has used 13021 Kbytes of disk space to save unprotected customized system files on your system to a .PreUPD extension.

Unprotected customized system files are DEC OSF/1 system files that have been customized by users or by layered product implementation. The files are in danger of being overwritten without the customizations in them being saved because they are unprotected.

If you have already backed up your entire system, you can continue with the update installation and restore customizations to the newly installed files at a later time. Continuing at this point causes all files saved to a .PreUPD extension to be removed.

If you want to ensure that the unprotected customized system files on this system have been backed up, you can select option u from the following menu and invoke the Update Administration Utility. This utility allows you to view and save unprotected customized system files on your system. The utility also allows you to continue or quit the update installation procedure. If you quit the update installation procedure at this point, the system returns to the same state it was in prior to invoking the update installation.

DEC OSF/1 Update Installation Main Menu

- ```

c) Continue installation
q) Quit installation
u) Update Administration Utility
v) View error message again
```

Enter your choice:

If the amount of space that the update installation can buy back is not enough to allow the loading of new subsets, a message similar to the following is displayed:

```

file system /usr needs 11104 Kbytes more to install the software
specified.

```

You will need to remove some software subsets and/or user files from this system before performing an update installation.

Returning system to Pre-Update state...done.  
Update Installation exiting.

## 2.6.5 Loading Subsets and Merging

Next, `installupdate` loads the DEC OSF/1 Version 3.2 subsets that match the subsets already loaded on your system. All new mandatory subsets are loaded automatically. Optional subsets are loaded only if they were loaded previously. If you want to install additional optional subsets provided in DEC OSF/1 Version 3.2, you must load these using the `setld` command when `installupdate` is complete.

A series of messages similar to the is displayed:

```
***** Updating system to DEC OSF/1 X3.2 (Rev. xxx)
Working....Tue Jan 03 10:43:13 EDT 1995
```

```
Base System
 Copying from ds9 (inet)
 Working....Tue Jan 03 14:44:23 EDT 1995
 Verifying
 Working....Tue Jan 03 14:46:03 EDT 1995
```

```
Base System - Hardware Support
 Copying from ds9 (inet)
 Working....Tue Jan 03 14:46:35 EDT 1995
 Verifying
```

```
.
.
.
```

```
Ref Pages: Admin/User
 Copying from ds9 (inet)
 Working....Tue Jan 03 16:18:03 EDT 1995
 Verifying
```

```
Ref Pages: Realtime
 Copying from ds9 (inet)
 Verifying
```

When the subsets are loaded and verified, the protected customized system files are automatically merged with any customized files found on your system. Refer to Section 2.1.1 for a description of the protected files. A

series of merge messages similar to the following are displayed:

```
*** Merging new file ./etc/.new..inittab into
 existing ./etc/.proto..inittab

 Modifying kloadsrv entry

 Merge completed successfully.

*** Merging new file
 existing

 adding Asynchronous Transfer Mode option

 Merge completed successfully.
```

When all merges are complete the update installation displays the following message:

```
Update Installation complete with loading of subsets.
Rebooting system with DEC OSF/1 V3.2 (Rev xxx)
generic kernel for configuration phase...
```

Next, the update installation configures the software subsets. Proceed to Section 2.6.6.

### Note

If the Logical Storage Manager (LSM) was previously installed, the update installation of LSM may produce some file system warning messages during the reboot process regarding unreferenced files. You can ignore these messages. These unreferenced files are the LSM-specific device special files that are modified during the update installation procedure.

#### 2.6.5.1 Recovering from Failures During Loading of Subsets

If the update installation fails before subsets are loaded, you can usually recover.

If necessary, you can bring your system back to multiuser mode by issuing the following command:

```
init 3
```

Error messages describe the type of error that occurred. Fix the error(s) reported by the message(s) and restart the update installation process. Refer to Section 2.4 if you are running `installupdate` from a CD-ROM, or Section 2.5 if you are running `installupdate` from a RIS server.

If the update installation fails during the loading of subsets, you most likely will have to restore your Operating System back to the original version of DEC OSF/1 that was previously installed on your system and reattempt the



update installation after the source of failure has been identified.

## 2.6.6 Configuring Subsets and Merging

If the system is set to boot to multiuser mode, configuration of the new system will start automatically. If the system reboots to single user mode, enter the following command:

```
init 3
```

A series of messages similar to the following is displayed:

```
*** SYSTEM CONFIGURATION ***

Configuring "Base System " (OSFBASE320)

 *** Merging new file ./etc/.new..inittab into
 existing ./etc/inittab

 Modifying kloadsrv entry

 Merge completed successfully.

Configuring "Base System - Hardware Support " (OSFHWBASE320)
Configuring "Compiler Back End " (OSFCMPLRS320)
 .
 .
 .
Configuring "Ref Pages: Admin/User " (OSFMANOS320)
Configuring "Ref Pages: Realtime " (OSFMANRT320)
```

## 2.6.7 Building the Kernel

The kernel configuration begins after the configuration of subsets is complete. The system automatically builds a kernel and then reboots. During this phase of the update, the system configuration file `/sys/conf/<system_name>` is automatically saved to `/sys/conf/<system_name>.bck`, and the following message is displayed:

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

In the previous example, ARUBA is the host name of your system. (If you customized this file, one of the post-installation tasks is to edit the new version and include your customizations.)

The kernel build proceeds with the following messages:

```
The system will now automatically build a kernel
and then reboot. This will take approximately 15
minutes, depending on the processor type.
```

```
*** PERFORMING KERNEL BUILD ***
Working....Tue Jan 03 17:24:09 EDT 1995
Working....Tue Jan 03 17:25:10 EDT 1995
Working....Tue Jan 03 17:27:29 EDT 1995
```

### Caution

The update provides a basic kernel configuration file that includes the required options and pseudodevices needed to be compatible with the current installed version. However, the update does not propagate any special configuration options (such as those required for layered products).

If your system also has devices not supplied by Digital, you will need to manually add these options and/or devices to the kernel configuration file. Use the `doconfig` command and refer to Chapter 6 for more information.

After the kernel builds successfully, you are prompted to log into your system. If you have a workstation, a login window is displayed. Enter the same login name and password that you used before the update installation. If you do not have a workstation, enter your login name at the `login` prompt and your password at the `password` prompt. The update installation is done; your system is fully updated to DEC OSF/1 Version 3.2 and ready to use.

Proceed to Section 2.8 for information about performing postinstallation tasks.

#### 2.6.7.1 Recovering from Failures During Kernel Build

If the tailored kernel build fails at the end of your update installation, the following may have occurred:

- A kernel layered product is incompatible with the base operating system. If layered products are installed, a tailored kernel build is automatically attempted with only the base operating system. If this build fails or if layered products are not installed, the next reason is more likely.
- The merge of either the `/sys/conf/files` or `/sys/conf/alpha/files` file has failed.

To work around the file merge failure, perform the following steps:

1. Exit the tailored kernel build by pressing Ctrl/c. This causes the generic kernel to boot.
2. Change to the `/sys/conf` directory as follows:  

```
cd /sys/conf
```
3. Rename the `files` file as follows:  

```
mv files files.bck
```
4. Create a new `files` file as follows:  

```
cp .new..files files
```

This propagates the latest `files` file to the configured state. Be sure to add any customizations contained in the `files.bck` version to the new `files` file.
5. Change to the `/sys/conf/alpha` directory.
6. Repeat steps 3 and 4 for this directory.
7. Rebuild the tailored kernel using `doconfig`. After the tailored kernel builds, copy the kernel to `/vmunix`, and reboot.

## 2.7 Device Special File Name Changes

Device special file names may change as a result of the update installation. After successfully completing an update installation, it is possible that if you have added tape devices to your system after the initial installation, the unit numbers and device special file names may be reordered (remapped) as a result of the update process.

As an example, tape device `tz13` is installed with device special file names `*rmt0*`. Then, tape device `tz12` is installed and assigned device special file names `*rmt1*`. After an update installation, tape device `tz12` is assigned device special file names `*rmt0*`, and tape device `tz13` is assigned device special file names `*rmt1`.

## 2.8 Postinstallation Tasks

This section describes any tasks that must be completed after the update is complete.

### 2.8.1 Reviewing Update Installation Log Files

Information about the update installation is stored in log files for you to review. Installation and configuration data is appended to any existing log files. Review the last entries in the following files to check the latest installation and configuration data:

- The update installation log is located at:  
/var/adm/smlogs/update.log
- Information about the system configuration is stored in a log file at:  
/var/adm/smlogs/it.log
- Obsolete files are listed in:  
/var/adm/smlogs/upd\_obsolete\_files
- Customized files are listed in:  
/var/adm/smlogs/upd\_custom\_files
- Failed merges are listed in:  
/var/adm/smlogs/upd\_mergefail\_files

If no obsolete, customized, or failed merge files are detected during the update installation, the relevant log files will not contain any data.

A sample installation dialogue is located in Appendix I. Sample listings of files that were found and saved during the update are shown in Appendix J. Digital recommends that you examine the log file when the update is complete to ensure that all files merged successfully.

## 2.8.2 Manually Merging Customizations

Some protected files may not be correctly merged during the update, and some unprotected files are not automatically merged. Manual merging involves editing the new versions of system files with a text editor to paste in your customizations. The following information is saved so that you can merge your customizations into the new versions.

- Unprotected system files

When the update is complete, you should check for any saved files. Refer to the log file: /var/adm/smlogs/upd\_custom\_files. Edit the new version of each logged file to include your customizations.

- Configuration file

You must also edit the system configuration file /sys/conf/system\_name if you customized this file in the previous version of DEC OSF/1. The saved version is located in /sys/conf/system\_name.bck.

- Failed merges

If any files failed to merge during the update, an error message is displayed on your screen. This error is also logged in a file located at: /var/adm/smlogs/upd\_mergefail\_files. Check the log to identify any failed merges and manually edit any files that failed to merge, adding your customizations. The original version of the files will always be preserved for your reference as: filename.PreMRG. Refer

to Section 2.9 for information on how to access the original version of a file.

When any manual merges are complete, your system is ready to use. At this time you can install additional optional subsets provided on the DEC OSF/1 Version 3.2 distribution media. Refer to Chapter 8 for information about installing optional subsets.

## 2.9 Update Administration Utility

When you are satisfied that all merges are correct and your system is working as expected, use the Update Administration Utility to perform management tasks (such as saving, viewing, or deleting files) on the unprotected customized, obsolete, and PreMRG files. Unprotected customized files are saved to files with `.PreUPD` extensions.

Apart from managing system resources effectively, using this utility provides two important safeguards:

- You can archive and delete customized files so that future update installations can reuse the filenames. If you attempt to run an update without having first used this utility to administer PreUPD files from the previous update, the installation will detect these and prompt you to overwrite the existing PreUPD files or to exit the utility.
- You can remove obsolete files that may cause problems when running the new version. In particular, many obsolete reference pages can remain in system directories, and there is a risk that an incorrect reference page might be displayed.

### Note

Refer to Section 2.10 for information about updating the `whatis` reference page database after performing an update installation.

### 2.9.1 Update Administration Utility Main Menu

Enter the following command to access the Update Administration Utility Main menu:

```
/usr/sbin/updadmin
```

You can also invoke the Update Administration Utility from the Setup menu. If you have a workstation, choose the `Setup` option from the `Applications` menu in the window's Session Manager. If you do not have a workstation, enter the following command to access the Update

## Administration Utility:

```
/usr/sbin/setup
```

A submenu of options is displayed that varies depending on the software installed on your system. Choose the Update Administration option from this submenu. The Update Administration Utility can be invoked only after an update.

Regardless of the manner in which you invoked the utility, the Update Administration Utility Main menu is displayed as follows:

The Update Administration Utility is used to perform administration functions on a system that has been updated by /sbin/installupdate.

Please make a selection from the following menu.

### Update Administration Utility Main Menu

- ```
-----  
c) Unprotected Customized File Administration  
o) Obsolete System File Administration  
p) PreMRG File Administration  
x) Exit this utility
```

To exit from the utility and return to the operating system prompt at any time, choose the exit option as follows:

```
# Enter your choice: x
```

Choose the following options to perform file administration tasks (such as saving, viewing, or deleting files):

- Unprotected Customized File Administration

When you choose this option, the following information is displayed:

```
***** Unprotected Customized System File Administration *****
```

Unprotected customized system files are typically DEC OSF/1 system files that have been customized by users for projects they may be working on, or by layered product software implementation.

Some of these customized files may no longer be compatible with the DEC OSF/1 Version 3.2 Operating System.

- Obsolete System File Administration

When you choose this option, the following information is displayed:

```
*** Obsolete System File Administration ***
```

There are DEC OSF/1 files currently installed on your system that are no longer shipped or supported in DEC OSF/1 Version 3.2.

Some of these Obsolete files may no longer be compatible with the DEC OSF/1 Version 3.2 Operating System. You may want to back up these files and then delete them from your system to regain disk space. For your reference, the Obsolete files are listed in /var/adm/smlogs/upd_obsolete_files.

- PreMRG File Administration

Premerge (PreMRG) files are protected files that are on your system from a previous update. When you choose this option, the following information is displayed:

```
***** PreMRG System File Administration *****
```

```
There are .PreMRG files left over on your system from an update
installation. PreMRG files are copies of system files as they existed
prior to updating your system. They are left on the system after an
update installation for reference purposes only.
```

```
If any system file customization merges were not successful, you can
reference the .PreMRG file to include those customizations in the
post merged file now residing on the system.
```

```
In most cases, PreMRG files can be deleted from the system.
```

If you choose any of the three main menu options, a submenu is displayed. This submenu displays options to view, save, or delete the unprotected, obsolete, or PreMRG files.

The following examples show only Unprotected Customized File Administration. The administration process, and the submenu options, are exactly the same for Obsolete System File Administration and PreMRG File Administration.

To select an option from any menu, enter the character displayed before each option and press the Return key. For example:

```
# Enter your choice: c 
```

2.9.2 File Administration Menu Options

If you select any of the three Administration options from the main menu, the File Admin menu is displayed as follows:

```
Unprotected Customized System File Admin Menu
```

```
-----
s) Save files
d) Delete files
v) View list of files
x) Return to previous menu
```

The type of the submenu depends on the option you chose from the Main menu. Enter x to return to the Main menu. The other options in this submenu are described in the following sections.

2.9.3 Save Files Option

This option enables you to save all the files that were found during the update installation. You can decide where to store them. This option is useful for managing disk space.

If you choose this option, another menu is displayed as follows:

```
Select a method of archiving your files:
-----
d) Save files to directory on disk
i) Save files to tar image on disk
t) Save files to tape media device

Enter your choice from the menu above, or
press <RETURN> to go back to the previous menu:
```

- If you want to save the files to a tape device, enter **t** and press Return. You will be prompted to enter the name of a backup device, as follows:

```
Enter the name of the tape backup device (for example: /dev/nrmt0h)
that you want to use to back up customized files, or press <RETURN>
to go back to the previous menu:
```

Enter the device name as follows:

```
....previous menu: /dev/nrmt0h
```

The save utility verifies the device and saves the files as follows:

```
Inspecting /dev/nrmt0h...
```

```
Saving customized files to /dev/nrmt0h...
done.
```

- If you want to save files to a directory, enter **d**. The following message is displayed:

```
Enter the directory that you want to use to back up obsolete
files, or press <RETURN> to go back to the previous
menu:
```

If the pathname that you specify does not already exist, you will be asked to confirm if the directory or file should be created (in this example the **/obsolete** was specified and does not exist):

```
There is no /obsolete directory on this system.
```

```
Do you want to create one? (y/n) [y]: y
```

```
Saving obsolete files to /obsolete
Finished saving obsolete files.
```

The files are now saved. You can return to the File Administration menu to either choose another option or exit to the Update Administration Utility Main menu.

2.9.4 Delete Files Option

This option enables you to delete all the files (obsolete, PreMRG, or unprotected customized) that were found during the update install. Use this option if you have either backed up the files to a storage device or if you no longer need them and you want to recover the disk space.

If you choose this option, the following prompt is displayed:

```
Please confirm your intent to delete customized system files from the
system. (y/n) [n]:y
```

If you confirm the deletion, a message is displayed as follows:

```
Removing customized files...
```

```
Finished deleting customized files.
```

When the deletion is complete, the File Admin menu is displayed again.

2.9.5 View List of Files Option

This option is used to display a list of the customized files that were found during the update installation. It can be used to verify what files were found, before you decide whether you want to save or delete the files.

If you choose this option, the list of files is displayed screen by screen and you can press Return to display each screen. At the end of the list you can display the complete list again or return to the File Admin menu. A sample of the output follows:

```
=====
= Unprotected Customized OSFBASE Files
=====
./etc/zoneinfo/Australia/South.PreUPD

=====
= Unprotected Customized OSFINET Files
=====
./sbin/named.PreUPD
./usr/sbin/screend.PreUPD

Enter 'r' to review files again, or press RETURN
to go back to the previous menu:
```

2.9.6 Messages and Archive Options

There are several messages and options that the Update Administration Utility displays only under certain conditions. These messages are explained as follows:

- If you choose an option to process certain files and the list of files has already been removed from the system, one or more of the following

messages is displayed:

No customized file list exists.
No obsolete file list exists.
No PreMRG file list exists.

- If you attempt to save files to a directory that does not exist you are prompted to confirm that you want this new directory to be created.
There is no <name> directory on this system.
Do you want to create one? (y/n) [y]:
- If the program cannot create the directory that you specified, the following message is displayed:
Cannot create <directory name>.
- If you choose an option relating to .PreMRG files, the following message warns you that the utility will search every file system that is UNIX File System (UFS) mounted:
Checking system for .PreMRG files. Depending on the number of filesystems mounted, this may take a few minutes...
- If you choose an option to save files to a tar image, the following message gives you a further option to compress your tar file and save storage space.
Compressing the tar image will result in less disk space used.
Do you want to compress the tar image? (y/n) [y]:
- If the save program was unable to compress the tar file, the following warning message is displayed:
Unable to compress <tar file>
- If you chose an option to delete files that have not been backed up, you are given an option to select another menu item and save the files first.
Back up of <file type> files not detected.
If you have not backed up the <file type> files yet, please do so at this time by answering 'no' to the question below and selecting the 's' option from the previous menu.
- If you are attempting to save files that have already been saved, the following message is displayed:
You have already saved the <file type> files.
Do you want to save them again? (y/n) [n]:
- If you specify a device for a save operation, and the save program cannot

access that device, the following message is displayed:

Cannot locate a special device named <device name>

- If the device that you specified was available, but the save program was not able to write to that device, the following message is displayed:

Cannot write to <device name>

- If you specify an existing tar file name, you are given the option to append saved files to the existing file:

A file named <file name> already exists on this system.

If this is a tar archive file you can append additional files to it. Otherwise, answer 'n' to the question below.

Do you want to try appending to it? (y/n) [n]:

2.10 Updating the whatis Database

If the `whatis` database exists on your system, you should update the database by executing the `catman -w` command whenever you perform an update installation. The `apropos` and `whatis` commands access reference page entries in the `whatis` database.

An update installation does not delete entries from an existing `whatis` database. You must manually rebuild the database to synchronize it with reference page files that currently exist on the system. Rebuild the `whatis` database after you use the Update Administration Utility to remove reference pages that are flagged as obsolete after the update installation and after you have finished adding layered product reference pages. For information about using the `catman -w` command to rebuild the `whatis` database, refer to the `catman(8)` reference page.

Read this chapter if you plan to perform an advanced installation. This chapter contains information to help you determine which disk partition to use for file systems, swap space, and crash dump space. You should know what the file systems will be used for and understand the concepts associated with allocating a file system to a disk partition. Refer to the *System Administration* manual for more information.

Throughout this chapter you are encouraged to complete worksheets to calculate the size of a file system. These worksheets will help you to:

- Identify available disks
- Plan the swap space
- Plan the `var` area
- Plan the `/usr` file system
- Decide whether to use the default disk partition layout, the existing disk partition layout, or change the partition layout if necessary.

It will be helpful to keep in mind the following equations:

- One block equals $\frac{1}{2}$ kilobyte (kB) or 512 bytes.
- One megabyte (MB) equals 1024 kB (1,048,576 bytes), or 2048 blocks.

For example, to determine the size in MB of the default disk partitions for an RZ56 disk, divide the size, in blocks, by 2048.

If you are installing a new system on a disk currently being used under a DEC OSF/1 or another OSF/1 implementation, and the disks have been labeled, you can determine the size of the disk partitions by becoming `root` and using the `disklabel` command, which is described in Chapter 7. You can also refer to the disk information provided in Appendix D to determine the default size of the disk partitions.

The DEC OSF/1 system uses 15 percent of a partition for UNIX file system (ufs) overhead and 20 percent overhead for Advanced File System (AdvFS) overhead. When you determine the size your disk partitions need to be, subtract 15 or 20 percent of the partition size to give you the total available space.

If you plan to use the POLYCENTER Advanced File System (AdvFS) as the file system for DEC OSF/1 and you install the optional AdvFS Utilities,

space planning is greatly simplified. With the AdvFS utilities (separate license required), you can add or remove volumes from the AdvFS file systems with no changes to the directory structure and with no user interruption.

With the exception of the `root` file system, AdvFS file system size can be modified at any time (with the `addvol` command). Increases or decreases to file system size are transparent to the user. Consequently, there is no need to greatly over-allocate file system space.

The information in Section 3.1, Section 3.2, Section 3.3, Section 3.4, and Section 3.5 will help you complete the summary worksheet in Section 3.6. When complete, this worksheet provides the file system layout information that is required during the advanced installation.

3.1 Planning Disk Layout

Your system disk must be one of the supported devices. Table 3-1 shows the supported devices and their associated DEC OSF/1 names.

Table 3-1: Supported System Disks

DEC OSF/1 Name	Device Name
<code>ra</code>	RA60, RA71, RA72, RA73, RA81, RA82, RA90, RA92
<code>rz</code>	RZ24L, RZ25, RZ25L, RZ26, RZ26L, RZ28, RZ28B, RZ35, RZ55, RZ56, RZ57, RZ58, RZ73, RZ74, HSZ10, HSZ40

Refer to the *Software Product Description* (SPD) for a list of supported system and data disks.

Note

Refer to Section 5.5.3 for restrictions surrounding the use of the RZ24L and RZ55 disks as system disks.

The system disk contains the `root` file system. The unit number for the system disk must be in the range 0 to 254 for `ra` type devices or in the range 0 to 31 for the other types of devices.

Use the console command `show device` to determine the disks on your system. Use your system's hardware documentation and the disk information in Appendix D to determine the device name and the size of each partition. Complete the worksheet in Table 3-2 to record this information.

Although the worksheet provides space for four disks, you can configure many more disks. Refer to the *Software Product Description (SPD)* for the number of devices that can be configured on each type of system.

If you are installing a new system on a disk, use the `disklabel` command to look at the existing disk partition layout. Invoke the `disklabel` command if your system is already running DEC OSF/1 or invoke `disklabel` from the SYSTEM MANAGEMENT option from the Installation menu.

Enter the `disklabel` command in the following format and replace the variable *n* with the unit number of the disk:

`disklabel -r /dev/rzra`

The system displays the existing disk partition layout. If you want to create a new partition table, choose the SYSTEM MANAGEMENT option before starting the installation and use the `disklabel` command to customize partition tables. During an advanced installation, if a customized partition table exists on the system disk, you will be given an option to use either the default partitions or the existing customized partitions. Refer to Section 7.8 for more information about customizing disk partitions.

Table 3-2: Disk Configuration Worksheet

Disk Number	Device Name	Partition	Size (MB)
1	_____	a	_____
		b	_____
		c	_____
		d	_____
		e	_____
		f	_____
		g	_____
		h	_____
2	_____	a	_____
		b	_____
		c	_____
		d	_____
		e	_____
		f	_____
		g	_____

Table 3-2: (continued)

Disk Number	Device Name	Partition	Size (MB)
3	_____	h	_____
		a	_____
		b	_____
		c	_____
		d	_____
		e	_____
		f	_____
		g	_____
4	_____	h	_____
		a	_____
		b	_____
		c	_____
		d	_____
		e	_____
		f	_____
		g	_____
		h	_____

3.2 Planning the Swap Space

Virtual memory is implemented in the DEC OSF/1 Operating System by transparently moving pages back and forth between physical memory and swap space. The amount of virtual address space that can be created is limited only by the amount of swap space. This section discusses some of the factors to consider when configuring swap space on your system.

The advanced installation procedure allows you to configure two swap areas: a primary swap partition named `swap1` and an optional swap partition named `swap2`. Additional swap partitions can be configured after installation is complete by using the procedures described in the *System Administration* manual.

During an advanced installation, you are asked to choose which disk partition to use for `swap1`. The default choice is partition `b` of the system disk. The partition chosen must contain at least 131,072 blocks (64 MB). On systems with more than one disk, Digital recommends that you allocate the primary swap partition on the system disk.

An effective strategy to determine how much disk space to set aside for swapping is to compare the aggregate modifiable virtual address space needs of the processes that you plan to run with the size of your system's physical memory. Modifiable virtual address space holds data elements and structures that are modified during process execution, such as heap space, stack space, and data space. If you expect the aggregate need for modifiable virtual address space to be greater than your system's physical memory, consider allocating at least as much swap space as the size of your system's physical memory.

Be prepared to add more swap space later if the system issues warning messages that indicate that swap space is approaching exhaustion. On systems where the balance between modifiable virtual address space usage and available physical memory is more even, somewhat less swap space is required.

Refer to the worksheet in Table 3-2 to identify partitions that are large enough for use as swap partitions. Record the location of the swap space in the following table:

Swap Space	Size in MB	Disk Number	Partition
swap1	_____	_____	_____
swap2	_____	_____	_____

3.3 Planning the Crash Dump Space

Two disk areas are used when the system produces a crash dump. The first area is used to hold the crash dump until the system is rebooted. This area must be large enough to hold a single crash dump and is referred to as the crash dump partition. The second area is where the `savecore` utility copies the crash dump and a copy of `/vmunix` when the system is rebooted. This area is located in the `/var/adm/crash` directory. The disk partition that contains `/var/adm/crash` must be at least large enough to hold one crash dump and one copy of `/vmunix`, but can be made as large as resources permit if retention of multiple crash dumps is desired.

In the event of a system crash, the kernel writes the contents of physical memory to the crash dump partition. The amount of information written, and hence the size of the crash dump, depends on several factors:

- If the system is configured to produce full dumps as described in the *System Administration* guide, the size of the crash dump will be the same as the size of the system's physical memory.
- If the system is configured to produce partial dumps, the crash dump might be considerably smaller.

The factor that determines the size of a partial crash dump is the amount of physical memory in use at the time of the crash by various kernel data structures that define the state of the system. The more tasks and threads that are active, the more kernel data structures that will be in use, and the larger the resulting partial crash dump.

The crash dump partition must be as large as the size of physical memory on systems configured for full dumps, and can be somewhat smaller on systems configured for partial dumps. The disk partition that contains `/var/adm/crash` must be large enough to hold at least one crash dump and one copy of `/vmunix`. If retention of multiple crash dumps is desired, the required size of this partition can be estimated by multiplying total size required for a single crash dump and a copy of `/vmunix` by n , where n is the number of crash dumps that you want to retain. To determine the size and to record the location of the crash dump space, provide the following information:

1. The memory size in MB for your system is _____.
2. You need _____ memory to accommodate your crash dump partition. Refer to Table 3-2 to identify the partition that is large enough for the crash dump space.
3. You need _____ MB minimum disk space in the `/var/adm/crash` directory.

3.4 Planning the var Area

The `var` area contains volatile, machine-specific directories and directories such as `tmp` and `adm`.

You can allocate the `var` area either as a file system on its own partition, or as a directory in the `/usr` file system. Depending on system use, the `var` area can potentially use large amounts of space in the `/usr/var` directory. If system use is heavy, you might want to create a separate `var` area.

If you choose the default allocation, the installation software allocates the `var` area as the `/usr/var` directory.

To determine the size of the `var` area, consider the following:

- Crash dump space

- Error logger
- System accounting
- Size of the `/var/adm/ris` directory, if your system is a RIS server
- If you are planning to run a dataless environment, you should decide whether you want `/var` on a separate file system or whether you want to reserve a partition to mount under `/var/adm/dms`. Refer to *Sharing Software on a Local Area Network* for more information about running a dataless management environment.
- Space required for `mail`, `print`, and `uucp` spooling

Section 3.4.5 describes how these items affect the size of the `var` area. As you read through each section, complete the worksheet in Table 3-3.

3.4.1 Error Logger and `syslog` Files

The `var` area requires room to accommodate the log files produced by both `syslog` and the binary error logger. These log files are a record of system events and errors in ASCII text (`syslog`) and binary formats.

The `syslog` utility collects information regarding such system activities as mail, system startup, shutdown, rebooting, root account logins, time daemon, printer subsystem, and `syslog` itself. Summary information on hardware errors is also logged. The amount of data logged is related to system activity and the number of users.

The binary error logger records information on hardware errors and system startup.

If you are creating a new system, estimate your total requirements at about 500 kB per week. There is no limit to how large the `/var/adm/binary.errlog` and the `/var/adm/syslog` files can grow, so they might eventually fill their partition. If you plan to back up or remove these log files once a month, you need to plan your total requirements at about 2 MB.

Enter the amount of space needed for the error logger on the second line of Table 3-3.

3.4.2 System Accounting

The `var/adm` directory in the `var` area contains data files generated by administrative programs such as `acct` and `wtmp`. The data that these programs generate can vary widely from system to system and over time. For example, if you create a `/var/adm/acct` file, it can grow by 50 kB a day for a large system and by 5 kB a day for a workstation.

As a general guideline for system accounting, you should allot 10 kB per day for workstations and 100 kB per day for larger systems. If you back up or remove the system accounting file once a month, you should plan for accounting files that occupy about 300 kB for workstations and 3 MB for large systems. Refer to *System Administration* for more information on the space requirements for system accounting.

Enter the amount of space needed for system accounting on the third line in Table 3-3.

3.4.3 Size of the `/var/adm/ris` Directory

If you are going to set up your system as a RIS server, you can choose to transfer software subsets from distribution media to the `/var/adm/ris` directory in the `var` area. Anyone with a DEC 2000 series, DEC 3000 series, or a DEC 4000 series processor can then install the software subsets residing in this directory by using the network. Refer to *Sharing Software on a Local Area Network* for more information on setting up the network kit.

You must reserve enough space in the `/var/adm/ris` directory in the `var` area for the software you want to install. Refer to Appendix B for a description of each software subset and the names of other subsets or kernel configuration file options related to its operation. Refer to the DEC OSF/1 *Release Notes* for the subset sizes.

Fill in the fourth line on the worksheet in Table 3-3 with the amount of space needed for the `/var/adm/ris` directory in the `var` area. If you plan to mount a separate partition on the `/var/adm/ris` directory after the installation, enter a 0 (zero) for item 4 in Table 3-3. (Refer to Section 3.4.5.)

3.4.4 Size of the `/var/adm/dms` Directory

This section applies only if you are setting up a dataless management environment on a server system.

In a dataless management environment, the dataless server's environment file systems are located in `/var/adm/dms/dmsn.alpha`. Each environment must have at least the DEC OSF/1 mandatory subsets installed as well as other optional software subsets. Space must be reserved for layered products plus an additional 10% for file system administration tasks and file system information. Refer to the *Release Notes* for software subset sizes. For more information about the size requirements of a dataless environment, refer to *Sharing Software on a Local Area Network*. A worksheet in that guide is provided to help you calculate the amount of space required for a single `/var/adm/dms` file system.

Fill in the fifth line on the worksheet in Table 3-3 with the amount of space needed for the `/var/adm/dms` environments in the `var` area. If you plan

to mount a separate partition on the `/var/adm/dms` area after the installation, enter a 0 (zero) for item 5 in Table 3-3.

3.4.5 Completing the var Worksheet

Add the values in column 3 of Table 3-3 to determine the space requirements for the `var` area.

Table 3-3: var Worksheet

Item	Obtain Number From ...	Space Required in var
Crash dump space	Section 3.3	_____
Error logger	Section 3.4.1	_____
System accounting	Section 3.4.2	_____
Size of the <code>/var/adm/ris</code> directory	Section 3.4.3	_____
Size of the <code>/var/adm/dms</code> directory	Section 3.4.4	_____
Total space required in var		_____

3.5 Planning the /usr File System

The `/usr` directory contains the majority of the operating system files, including libraries, executable programs, and documentation. The directory structure contains directories such as `/usr/sys`, `/usr/adm`, and `/usr/bin`.

During the installation procedure, you allocate the `/usr` file system either by accepting the default partition or by specifying another partition. If you choose the default allocation, the installation software allocates the `g` partition of the system disk.

To determine the size of the `/usr` file system, consider the following:

- Software subsets you plan to install on `/usr`
- Amount of user space needed
- Size of the `var` area if it is on the same partition as `/usr`

Over time, you will probably add files to the `/usr` file system. Because of this, the file system can potentially run out of space. Be sure to allow for free space on the `/usr` file system.

If you plan to use the POLYCENTER Advanced File System (AdvFS) as the file system for DEC OSF/1 along with the AdvFS Utilities (available with a separate license), you do not need to greatly over-allocate space for the `/usr` file system. AdvFS file system space can be dynamically increased without changing directory structures and without system interruption. Refer to *System Administration* for more information about the AdvFS file system.

Section 3.5.1 to Section 3.5.3 briefly describe how these items affect the size of the `/usr` file system. As you work through each section, complete the worksheet in Table 3-4.

3.5.1 Software Subsets Within the `/usr` File System

The `/usr` file system must be large enough to accommodate the software subsets that will reside within it. A software subset is a collection of executable files and data files needed to perform a specific function or to provide a particular class of services; for example, you need the System Accounting Utilities subset to perform system accounting.

Appendix B contains descriptions of the software subsets and a list of other subsets and kernel configuration file options related to each subset. The DEC OSF/1 *Release Notes* contains a table of software subset sizes.

The mandatory subsets are always installed. The optional subsets are not needed for your system to function; you can choose none, some, or all of the optional subsets, depending on your system requirements and available space.

You may want to consider allocating space for other layered products that are available for DEC OSF/1. When planning space requirements `/usr`, allow additional space if you will be adding products in the future. Refer to the specific layered product's *Release Notes* for the exact block size of the application.

Determine which subsets you will install, add their sizes together, and include any additional space that will be required for large applications in the near future. Enter the total on the first line of Table 3-4.

3.5.2 User Space Required

The advanced installation does not provide an area for user files; you need to set up this area after the installation. However, you should consider the amount of space needed for user files when planning your system. If you plan to place the users directory on `/usr`, you should reserve at least 10 MB of disk space for each user on your system. For example, if there are 10 users, you should reserve a minimum of 100 MB of disk space.

If you intend to set quotas on the user area, multiply the quota for each user by the number of users to determine the amount of user space. Refer to *System Administration* for information on disk quotas.

Enter the amount of space needed for the users directory on the second line of Table 3-4.

3.5.3 Size of the var Area

If you plan to place the `var` area on the same partition as `/usr`, you must add the total size of the `var` area from the worksheet in Table 3-3 to the total of `/usr`.

If appropriate for your system, enter the amount of space needed for `/var` on the third line of Table 3-4.

3.5.4 Completing the /usr Worksheet

Add the values in column 3 of Table 3-4 to determine the total space requirements for the `/usr` file system.

Table 3-4: /usr Worksheet

Item	Obtain Number from ...	Space Required in /usr
Software subsets	The DEC OSF/1 <i>Release Notes</i>	_____
Size of the user area	Section 3.5.2	_____
Size of the <code>var</code> area	Section 3.5.3	_____
Total space required in /usr		_____

Refer to Table 3-2 to identify partitions that are large enough for the `/usr` file system.

In the following table, record the software name (for example, `rz0`), disk number (for example 3), and partition where you plan to allocate the `/usr` file system:

Software Name	Disk Number	Partition
_____	_____	_____
_____	_____	_____

3.6 Determining the Disk Partition Layout

After you determine how much space your system needs for each file system, determine whether you can accept the default disk partition layouts. If you want to use a customized disk partition layout, choose the `SYSTEM`

MANAGEMENT option and use the `disklabel` command to modify the disks. The SYSTEM MANAGEMENT option is offered when you start the installation. Refer to Appendix D or the `/etc/disktab` file for information on the default disk partition layout.

If you modify the partition tables for the system disk, the `root` (or the a partition) must be at least 81,920 blocks (40 MB). If the modified partition does not meet this requirement, the advanced installation requires that you choose the default partition table for the system disk or restart the installation to select a different system disk. Other disks on the system are unaffected.

Enter the values that you determined in the previous sections in Table 3-5. This table will provide you with the complete file system layout and space requirements for your system.

Table 3-5: File System Worksheet

Items	Approximate Size	Device Name	Partition
Root	_____	_____	_____
swap1 (from Section 3.2)	_____	_____	_____
swap2 (from Section 3.2)	_____	_____	_____
Crash dump space (from Section 3.3)	_____	_____	_____
Error logger	_____		
System accounting	_____		
RIS area	_____	_____	
var total (from Table 3-3; fill in disk and partition lines if applicable)	_____	(_____)	(_____)
/usr total (from Table 3-4)	_____	_____	_____

After completing the worksheet, verify the disk partition layout. If you are installing a system for the first time, refer to Table 3-2 and to Appendix D or the `/etc/disktab` file for the default partition layout for your disk or disks.

Compare the disk partition layout with the total `var` and `/usr` values in Table 3-5. If the space required consumes more than 75 percent of the available disk space, not including the 15 percent of the partition that the file

system consumes, consider expanding the partition. After working the math out, choose the SYSTEM MANAGEMENT option when you begin the installation (as described in Chapter 4) and use the `disklabel` command to modify the default partition layout before beginning the installation. Refer to Chapter 7 for more information.

Proceed to Chapter 4 for instructions on how to shut down and boot your system. Shutting down and booting the system is the first step in the installation process.

When you perform a basic or advanced installation of the DEC OSF/1 Operating System software, you must prepare the hardware for the installation and then boot the system from the installation media. How you do this depends on which processor you have. This chapter provides booting instructions for each supported processor type.

If you are using a CD-ROM optical disc to boot your system, follow the instructions in Appendix A to load the CD-ROM into the disc drive.

If you are booting your system over the network, you are initiating an installation from a remote server. You can also boot a standalone kernel from a remote server to perform system management tasks. To boot over the network, you must be registered as a client on a Remote Installation Services (RIS) server. Refer to *Sharing Software on a Local Area Network* for information about registering your system.

4.1 Preparing the Hardware for the Installation

To prepare the hardware for the installation, do the following:

1. If your system is already running a version of DEC OSF/1, you must shut down your system and halt the processor using a command similar to the following:

```
# shutdown -h +10 preparing to install software
```

In the previous example, the system is shut down and halted in ten minutes and sends the message `preparing to install software` to all logged in users. Consult the *System Administration* guide if you need more information about shutting down a system.

2. If you are adding additional peripheral devices, connect the peripheral devices while your system is turned off.
3. Turn on power to the console terminal and all additional peripheral devices; otherwise, the peripheral devices will not be automatically configured by your system.

If you connect additional peripherals or controllers after the installation, refer to the *System Administration* guide for instructions about how to reconfigure your system.

4. Turn on power to the processor. The console subsystem prints various startup and diagnostic messages and ends with the console mode prompt (>>>).
5. Boot your system from the console mode prompt. The boot command you enter depends on the processor and the type of software distribution you are using: CD-ROM or network. The DEC 7000 series and DEC 10000 series processors can only be booted from CD-ROM.

Locate your processor in Table 4-1 and follow the instructions for booting your processor in the corresponding section of this chapter. When you have booted your processor, the basic and advanced installation procedures continue in Chapter 5.

Table 4-1: Location of Processor-Specific Boot Instructions

Processor	Section
DEC 2000 Series	Section 4.2
AlphaServer 2100 and 2000 Series	Section 4.3
DEC 3000 Series	Section 4.4
DEC 4000 Series	Section 4.5
DEC 7000 and 10000 Series	Section 4.6
AlphaStation 200 and 400 Series	Section 4.7
AlphaServer 1000 Series	Section 4.8
Digital AXPvme Series	Section 4.9
Digital AXPpci Series	Section 4.10
Processors supported in hardware releases later than DEC OSF/1 Version 3.2	Refer to <i>Hardware Release Notes</i>

Note

If you have problems booting your system, refer to the hardware documentation for your particular processor. If the problem is not hardware related, refer to the *System Administration* guide. This guide provides information about boot options such as booting a generic kernel (`genvmunix`) or booting an alternate custom kernel.

4.2 DEC 2000 Series Processor

The following sections describe how to boot the DEC 2000 processor from a CD-ROM optical disc and from the network.

4.2.1 Firmware Requirements

The minimum required firmware revision for the DEC 2000 series processor is Version 1.4. You must also have the correct firmware for the Adaptec EISA cards on your system. For DEC OSF/1 to run correctly, the Adaptec AHA1742A and AHA1740A SCSI EISA cards must have firmware with a ROM revision of G.2 or later.

Using the SRM console to determine the correct hardware revision, enter the following command:

```
>>> show config
```

A message similar to the following will be displayed:

```
This 1MB Flash contains VERSION 1.4 DEC 2000 Model 300 AXP console code
```

To determine the Adaptec SCSI EISA card firmware revision, enter the following command:

```
>>> show device
```

The device listing on your screen will contain a line similar to the following:

```
Host A/7/0 PROC AHA1742A G.2
```

Contact your field service representative if you need to obtain updated revisions of the firmware.

4.2.2 Running the EISA Configuration

Before you begin to install DEC OSF/1 you may need to run the EISA Configuration Utility (ECU) if:

- This is a first-time installation of DEC OSF/1
- You have changed the configuration of the machine by adding, removing, or relocating an EISA or ISA option card
- You have upgraded your firmware

Consult your hardware documentation for information on running the ECU.

4.2.3 Setting the Console Flags

Before starting the boot procedure, enter the following commands. Each command is echoed by the system when you press Return:

1. Clear the `boot_osflags` variable. This ensures that the correct kernel file boots automatically.

```
>>> set boot_osflags ""
```

2. Set the `auto_action` variable to `halt`. This halts the system at the console prompt each time the system is turned on, when the system crashes, or when you press the Halt button.

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

3. Set the keyboard variable to match the keyboard type on the system.

```
>>> set keyboard <type>
```

Use the `help set` command to list the available keyboard types.

4.2.4 Booting from the CD-ROM Optical Disc Kit

Place the CD-ROM optical disc into a caddy as described in Appendix A.

Use this procedure to boot the system:

1. Insert the CD-ROM optical disc labeled *Disc 1 - DEC OSF/1 Operating System V3.2*.
2. Enter the following command to determine the unit number of the drive for your device:

```
>>> show dev
```

The following information displays about the devices on your system:

BOOTDEV	ADDR	DEVTYPE	RM/FX	DEVNAM	REV	NUMBYTES
-----	----	-----	-----	-----	---	-----
EZ0A	08-00-2B-38-A1-92					
F00	PC Floppy	DISK	RM			
SCSI Devices..						
DKA200	A/2/0	DISK	FX	RZ25	0700	426.25MB
DKA400	A/4/0	RODISK	RM	RRD43	4.5d
DKA500	A/5/0	DISK	FX	RZ25L	0006	535.65MB
DKA600	A/6/0	DISK	FX	RZ28	435E	2.10GB
HOST	A/7/0	PROC		AHA1742A	G.2	

The numbers under `BOOTDEV` represent the unit number assigned to each drive on your system, where:

- The letters DK refer to a SCSI disk device
- The letters MK refer to a SCSI magnetic tape device
- The third letter (A or B) refers to the SCSI bus designation Refer to the hardware owner's guide for more details.
- The number refers to the drive number

3. Enter the `boot` command with the following syntax to boot from a CD-ROM. In the display from the `show dev` command entered, the CD-ROM is listed under `DEVNAM` as `RRD43` and under `BOOTDEV` as `DKA400`.

boot device

For example, to boot the system from CD-ROM drive number 4, enter the following command:

```
>>> b dka400
```

You have completed booting your system. Continue the installation procedure with Chapter 5.

4.2.5 Booting from the Network

To boot your system from the network, make sure it is registered as a client on a RIS server. Refer to *Sharing Software on a Local Area Network* for information on registering a client. The client must be on the same subnet as the server.

4.2.5.1 Booting from a DEC OSF/1 Server

When booting from a DEC OSF/1 server, the system uses the `bootp` protocol. Enter the following command to boot your system over the network:

```
>>> boot ez0
```

The installation software displays some system information, the memory and hardware configurations, and then displays the installation menu from which you choose which type of installation you want to perform.

If your initial network boot fails, enter `init` at the console prompt. If you encounter other problems during the RIS install, refer to *Sharing Software on a Local Area Network*.

You have completed booting your system. Continue the installation procedure with Chapter 5.

4.2.5.2 Booting from an ULTRIX Server

If you are booting from an ULTRIX server, the network uses the `mop` protocol.

Enter the following command to boot your system over the network:

```
>>> boot era0
```

The installation software displays some system information, followed by the memory and hardware configurations.

If your initial network boot fails, enter `init` at the console prompt. If you encounter other problems during the RIS installation, refer to *Sharing Software on a Local Area Network*.

You have completed booting your system. Continue the installation procedure with Chapter 5.

4.3 AlphaServer 2100 4/200, 4/275, and 5/250 and AlphaServer 2000 4/200 Processors

The following sections describe how to boot the AlphaServer 2100 4/200, 4/275, and 5/250 and AlphaServer 2000 4/200 from a CD-ROM optical disc and from the network.

4.3.1 Running the EISA Configuration Utility (ECU) Before Installation

Before installing the DEC OSF/1 Version 3.2 software on an AlphaServer 2100 4/200, 4/275, and 5/250, you must run the EISA Configuration Utility (ECU) if either of the following conditions is true:

- You are installing the DEC OSF/1 software for the first time on your system or you are installing a new version of the DEC OSF/1 software.
- You have changed the configuration of your system by adding, removing, or moving an EISA option card.

Refer to your hardware documentation for complete instructions on how to run the ECU program.

Note

You should always boot the generic kernel and run `doconfig` whenever you change your system configuration by adding, removing, or moving an EISA option card.

4.3.2 Setting the Console Flags

Before starting the boot procedure, complete the following steps:

1. Clear the `boot_osflags` variable. This ensures that the correct kernel

file boots automatically.

```
>>> set boot_osflags ""
```

2. Set the `auto_action` variable to `halt`. This will halt the system at the console prompt each time the system is turned on, when the system crashes, or when you press the Halt button.

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

4.3.3 Booting from the CD-ROM Optical Disc Kit

If your CD-ROM optical disc is not already in a caddy, follow the instructions in Appendix A.

Follow this procedure to boot the system:

1. Insert the CD-ROM optical disc labeled *Disc 1 - DEC OSF/1 Operating System V3.2*.
2. Enter the following command to determine the unit number of the drive for your device:

```
>>> show dev
```

The system displays a device information table similar to the following:

dka0.0.0.0.0	DKA0	RZ28
dkb0.0.0.1.0	DKB0	RZ28
dkc0.0.0.2.0	DKC0	RZ26
dkc100.1.0.2.0	DKC100	RZ26
dkc200.2.0.2.0	DKC200	RZ26
dkc300.3.0.2.0	DKC300	RZ26
dke100.1.0.4.0	DKE100	RRD43
mka500.0.0.0.0	MKA500	TLZ04
mke0.0.0.4.0	MKE0	TZ85
ewa0.0.0.6.0	EWA0	08-00-2B-2C-CE-DE
ewb0.0.0.7.0	EWB0	08-00-2B-2C-CE-DF
p_d0.7.0.3.0		Bus ID 7
pka0.7.0.0.0	PKA0	SCSI Bus ID 7
pkb0.7.0.1.0	PKB0	SCSI Bus ID 7
pkc0.7.0.2.0	PKC0	SCSI Bus ID 7
pke0.7.0.4.0	PKE0	SCSI Bus ID 7

The middle column shows the numbers assigned to each drive, where:

- The letters DK refer to a SCSI disk or CD-ROM device.
- The letters MK refer to a SCSI magnetic tape device.
- The third letter (A, B, C, D, or E) refers to the SCSI or DSA bus designation. Refer to the hardware owner's guide for more details.
- The number refers to the drive number.

3. Enter the `init` command with the following syntax:

```
>>> init
```

4. Enter the `boot` command with the following syntax to boot from a CD-ROM:

```
boot device
```

For example, to boot the system from CD-ROM drive number 1, enter the following command:

```
>>> boot dke100
```

The system displays output similar to the following:

```
(boot dke100.1.0.4.0)
block 0 of dke100.1.0.4.0 is a valid boot block
reading 16 blocks from dke100.1.0.4.0
bootstrap code read in
base = 1ee000, image_start = 0, image_bytes = 2000
initializing HWRPB at 2000
initializing page table at 1e0000
initializing machine state
setting affinity to the primary CPU
jumping to bootstrap code
```

```
OSF boot - Mon Aug 5 15:49:49 EDT 1993
```

You have completed booting your system. Continue the installation procedure with Chapter 5.

4.3.4 Booting from the Network

To boot your system over the network, make sure it is registered as a client on a RIS server. Refer to *Sharing Software on a Local Area Network* for information on registering a client. Note that the client must be on the same subnet as the server.

The `device` parameter is the network device from which you want to boot. The AlphaServer 2100 4/200, 4/275, and 5/250 and AlphaServer 2000 4/200 supports two network adapters: `ewa0` and `ewb0`.

Set your device protocols to allow booting from either a DEC OSF/1 server or an ULTRIX server.

4.3.4.1 Booting from a DEC OSF/1 Server

Use the following command syntax to boot your system over the network:

```
set device_protocols bootp
set device_inet_init bootp
```


For example, if the device you are booting from with the `bootp` protocol is `ewa0`, enter the following commands:

```
>>> set ewa0_protocols bootp
>>> set ewa0_inet_init bootp
>>> boot ewa0
```

You can override a previously set boot protocol. For example, if your system was previously set to use the `mop` boot protocol, you can overwrite it and use the `bootp` protocol by entering the following command:

```
>>> boot ewa0 -pro bootp
```

The installation software displays some system information, followed by the memory and hardware configurations.

If your initial network boot fails, enter `init` at the console prompt. If you encounter other problems during the RIS install, refer to *Sharing Software on a Local Area Network*.

You have completed booting your system. Continue the installation procedure with Chapter 5.

4.3.4.2 Booting from an ULTRIX Server

If you are booting from an ULTRIX server, use the following command syntax:

```
set device_protocols mop
```

For example, if the device you are booting from with the `mop` protocol is `ewa0`, enter the following commands:

```
>>> set ewa0_protocols mop
>>> boot ewa0
```

If your initial network boot fails, enter `init` at the console prompt. If you encounter other problems during the RIS install, refer to *Sharing Software on a Local Area Network*.

The installation software displays some system information, followed by the memory and hardware configurations.

You have completed booting your system. Continue the installation procedure with Chapter 5.

4.3.5 Prestoserve Option

These instructions apply to AlphaServer 2100 4/200, 4/275, and 5/250 and AlphaServer 2000 4/200 systems equipped with the Prestoserve option.

4.3.5.1 Firmware Requirements

The minimum firmware revision is Version 3.6. To determine which revision is on your system, enter the following command:

```
>>> show conf
```

The output will be similar to the following:

```
DEC 2100 (tm) console v3.6.....
```

4.3.5.2 The prcache Command

The AlphaServer 2100 4/200, 4/275, and 5/250 and AlphaServer 2000 4/200 system consoles provide the `prcache` command to support the Prestoserve option (NVRAM). Refer to hardware documentation for a description of this command.

You have completed booting your system. Continue the installation procedure with Chapter 5.

4.4 DEC 3000 Series Processor

The following sections describe how to boot the DEC 3000 series processor from a CD-ROM optical disc and from the network.

4.4.1 Setting the Console Flags

Before starting the boot procedure, enter the following commands. Each command is echoed by the system when you press Return:

1. Clear the `boot_osflags` variable. This ensures that the correct kernel file boots automatically.

```
>>> set boot_osflags ""
```

2. Set the `auto_action` variable to `halt`. This halts the system at the console prompt each time the system is turned on, when the system crashes, or when you press the Halt button.

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

3. Set the `boot_reset` variable to `on`. This ensures that all devices are initialized prior to booting.

```
>>> set boot_reset on
```

4. Set the `scsi_reset` variable to 4. This ensures that all devices have adequate time to initialize during the boot sequence.

```
>>> set scsi_reset 4
```

4.4.2 Booting from the CD-ROM Optical Disc Kit

Place the CD-ROM optical disc into a caddy as described in Appendix A.

Use the following procedure to boot the system:

1. Insert the CD-ROM optical disc labeled *Disc 1 - DEC OSF/1 Operating System V3.2*.
2. Enter the following command to determine the unit number of the drive for your device:

```
>>> show dev
```

The output of the `show dev` command displays information about the devices on your system:

BOOTDEV	ADDR	DEVTYPE	NUMBYTES	RM/FX	WP	DEVNAM	REV
DKA0	A/0/0	DISK	426.25MB	FX		RZ25	0700
DKA200	A/2/0	DISK	426.25MB	FX		RZ25	0700
DKA400	A/4/0	DISK	RM	WP	RRD42	4.3d
MKA500	A/5/0	TAPE		RM		TZK10	01B4
MKB500	B/5/0	TAPE		RM		TLZ04	

The numbers under `BOOTDEV` represent the unit number assigned to each drive on your system, where:

- The letters DK refer to a SCSI disk device
 - The letters MK refer to a SCSI magnetic tape device
 - The third letter (A or B) refers to the SCSI bus designation (refer to the hardware owner's guide for more details)
 - The number refers to the drive number
3. Enter the `boot` command with the following syntax to boot from a CD-ROM. In the display from the `show dev` command entered, the CD-ROM is listed under `DEVNAM` as `RRD42` and under `BOOTDEV` as `DKA400`.

boot device

For example, to boot the system from CD-ROM drive number 4, enter

the following command:

```
>>> b dka400
```

You have completed booting your system. Continue the installation procedure with Chapter 5.

4.4.3 Booting from the Network

To boot your system from the network, make sure it is registered as a client on a RIS server. Refer to *Sharing Software on a Local Area Network* for information on registering a client. The client must be on the same subnet as the server.

4.4.3.1 Booting from a DEC OSF/1 Server

When booting from a DEC OSF/1 server, the system uses the `bootp` protocol. Enter the following command to boot your system over the network:

```
>>> boot ez0
```

The installation software displays some system information, followed by the memory and hardware configurations.

If your initial network boot fails, enter `init` at the console prompt. If you encounter other problems during the RIS install, refer to *Sharing Software on a Local Area Network*.

You have completed booting your system. Continue the installation procedure with Chapter 5.

4.4.3.2 Booting from an ULTRIX Server

If you are booting from an ULTRIX server, the network uses the `mop` protocol. Enter the following command to boot your system over the network:

```
>>> boot esa0
```

The installation software displays some system information, followed by the memory and hardware configurations.

If your initial network boot fails, enter `init` at the console prompt. If you encounter other problems during the RIS install, refer to *Sharing Software on a Local Area Network*.

You have completed booting your system. Continue the installation procedure with Chapter 5.

4.4.4 Booting from the SCSI TURBOchannel Option Card

To boot from the dual SCSI TURBOchannel option card (PMAZB or PMAZC), complete the following steps:

1. Determine which controllers and devices are configured on your system by entering the following command at the console prompt:

```
>>> show conf
```

Your system will display output similar to the following (the output will differ depending on your system configuration):

```
DEC 3000 - M500  
Digital Equipment Corporation  
VPP PAL X5.37-82000101/OSF PAL X1.28-82000201 -  
Built on 03-JAN-1995 13:39:58.02
```

TCINFO	DEVNAM	DEVSTAT
-----	-----	-----
	CPU	OK KN15-AA -V2.0-S1F4-I039-sv1.0-DECchip 21064
P3.0		
	ASIC	OK
	MEM	OK
8		
	CXT	OK
7		
	NVR	OK
	SCC	OK
	NI	OK
	ISDN	OK
6		
	SCSI	OK
	3-PMAF-AA	TC3
	2-PMAZ-AA	TC2
	1-PMAZB-AA	TC1
	0-PMTNV-AA	TC0

The numbers under the TCINFO column (and the entries in the DEVNAM column) represent the unit number assigned to the PMAZB or PMAZC option card.

2. Determine the number of your boot device by entering a command with the following syntax:

```
t tcslot_number cnfg
```

For example, to determine the device number of a disk on a PMAZB option card, enter the following command:

```
>> t tcl cnfg
```

The system displays a table similar to the following:

DEC BOOTDEV	PMAZB-AA ADDR	V1.0 DEVTYPE	(Dual SCSI [53C96]) NUMBYTES	RM/FX	WP	DEVNAM	REV
DKA200 (rz200A)	A/2/0	DISK	426MB	FX		RZ25	0700
DKA400 (rz400A)	A/4/0	RODISK	409MB	RM	WP	RRD42	4.3d

To boot from the PMAZB (or PMAZC) option card, enter the `boot` command with the following syntax:

boot "slot_number/device_number"

For example, to boot from disk number 4 on the PMAZB option card located in slot 1, enter the following command:

```
>>> b "1/dka400"
```

You have completed booting your system. Continue the installation procedure with Chapter 5.

4.4.5 Booting from an FDDI Network Interface

Booting over an FDDI network interface is supported for DEFTA and CRE-DEFTA devices. Consult the *Release Notes* for information on supported devices and firmware.

To boot from an FDDI network interface device, find the device names as described in Section 4.4.4. For example, a DEFTA device appears as "PMAF-FA" when you use the `show conf` command. Identify the slot number and use one of the following commands, depending on the type of server that is required:

1. To boot from a DEC OSF/1 server using the `bootp` protocol, enter the following command:

```
>>> b "1/ez0"
```

2. To boot from an ULTRIX server using the `mop` protocol, enter the following command:

```
>>> b "1/esa0"
```

You have completed booting your system. Continue the installation procedure with Chapter 5.

4.5 DEC 4000 Series Processor

The following sections describe how to boot the DEC 4000 processor from a CD-ROM optical disc and from the network.

4.5.1 Setting the Console Flags

Before starting the boot procedure, complete the following steps:

1. Clear the `boot_osflags` variable. This ensures that the correct kernel file boots automatically.

```
>>> set boot_osflags ""
```

2. Set the `auto_action` variable to `halt`. This halts the system at the console prompt each time the system is turned on, when the system crashes, or when you press the Halt button.

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

4.5.2 Booting from the CD-ROM Optical Disc Kit

If your CD-ROM optical disc is not already in a caddy, follow the instructions in Appendix A.

Use the following procedure to boot the system:

1. Insert the CD-ROM optical disc labeled *Disc 1 - DEC OSF/1 Operating System V3.2*.
2. Enter the following command to determine the unit number of the drive for your device:

```
>>> show dev
```

The system displays a device information table similar to the following:

dka0.0.0.0.0	DKA0	RZ73
dkb0.0.0.1.0	DKB0	RZ73
dkc0.0.0.2.0	DKC0	RZ26
dkc100.1.0.2.0	DKC100	RZ26
dkc200.2.0.2.0	DKC200	RZ26
dkc300.3.0.2.0	DKC300	RZ26
dke100.1.0.4.0	DKE100	RRD42
mka500.0.0.0.0	MKA500	TLZ04
mke0.0.0.4.0	MKE0	TZ85
eza0.0.0.6.0	EZA0	08-00-2B-2C-CE-DE
ezb0.0.0.7.0	EZB0	08-00-2B-2C-CE-DF
p_d0.7.0.3.0		Bus ID 7
pka0.7.0.0.0	PKA0	SCSI Bus ID 7
pkb0.7.0.1.0	PKB0	SCSI Bus ID 7
pkc0.7.0.2.0	PKC0	SCSI Bus ID 7
pke0.7.0.4.0	PKE0	SCSI Bus ID 7

The middle column shows the numbers assigned to each drive, where:

- The letters DK refer to a SCSI disk or CD-ROM device
- The letters MK refer to a SCSI magnetic tape device
- The third letter (A, B, C, D, or E) refers to the SCSI or DSA bus designation (refer to the hardware owner's guide for more details)
- The number refers to the drive number

3. Enter the `init` command with the following syntax:

```
>>> init
```

4. Enter the `boot` command with the following syntax to boot from a CD-ROM:

```
boot device
```

For example, to boot the system from CD-ROM drive number 1, enter the following command:

```
>>> boot dke100
```

The system displays output similar to the following:

```
(boot dke100.1.0.4.0)
block 0 of dke100.1.0.4.0 is a valid boot block
reading 16 blocks from dke100.1.0.4.0
bootstrap code read in
base = 1ee000, image_start = 0, image_bytes = 2000
initializing HWRPB at 2000
initializing page table at 1e0000
initializing machine state
setting affinity to the primary CPU
jumping to bootstrap code
```

```
OSF boot - Tue Jan 03 15:49:49 EDT 1995
```

You have completed booting your system. Continue the installation procedure with Chapter 5.

4.5.3 Booting from the Network

To boot your system over the network, make sure it is registered as a client on a RIS server. Refer to *Sharing Software on a Local Area Network* for information on registering a client. The client must be on the same subnet as the server.

The `device` parameter is the network device from which you want to boot. The DEC 4000 processor supports two network adapters: `eza0` and `ezb0`.

Set your device protocols to allow booting from either a DEC OSF/1 server or an ULTRIX server.

4.5.3.1 Booting from a DEC OSF/1 Server

Use the following command syntax to boot your system over the network:

```
set device_protocols bootp
```

For example, if the device you are booting from with the `bootp` protocol is `eza0`, enter the following commands:

```
>>> set eza0_protocols bootp  
>>> boot eza0
```

You can override a previously set boot protocol. For example, if your system was previously set to use the `mop` boot protocol, you can overwrite it and use the `bootp` protocol by entering the following command:

```
>>> boot eza0 -pro bootp
```

The installation software displays some system information, followed by the memory and hardware configurations.

If your initial network boot fails, enter `init` at the console prompt. If you encounter other problems during the RIS installation, refer to *Sharing Software on a Local Area Network*.

You have completed booting your system. Continue the installation procedure with Chapter 5.

4.5.3.2 Booting from an ULTRIX Server

If you are booting from an ULTRIX server, use the following command syntax:

```
set device_protocols mop
```

For example, if the device you are booting from with the `mop` protocol is `eza0`, enter the following commands:

```
>>> set eza0_protocols mop  
>>> boot eza0
```

If your initial network boot fails, enter `init` at the console prompt. If you encounter other problems during the RIS installation, refer to *Sharing Software on a Local Area Network*.

The installation software displays some system information, followed by the memory and hardware configurations.

You have completed booting your system. Continue the installation procedure with Chapter 5.

4.5.4 Prestoserve Option

The following instructions apply to DEC 4000 systems equipped with the Prestoserve option.

4.5.4.1 Firmware Requirements

The minimum firmware revision is Version 3.3. To determine which revision is on your system, enter the following command:

```
>>> show conf
```

A display similar to the following will appear:

```
DEC 4000 (tm) console V3.3.....
```

4.5.4.2 The prcache Command

The DEC 4000 system console provides the `prcache` command to support the Prestoserve option (NVRAM). Refer to the hardware documentation for a description of this command.

You have completed booting your system. Continue the installation procedure with Chapter 5.

4.6 DEC 7000 and DEC 10000 Series Processors

The following sections describe how to boot the DEC 7000 processor and DEC 10000 processor from a CD-ROM optical disc.

4.6.1 Setting the Console Flags

Before starting the boot procedure, complete the following steps:

1. Clear the `boot_osflags` variable. This ensures that the correct kernel file boots automatically.

```
>>> set boot_osflags ""
```

2. Set the `auto_action` variable to `halt`. This halts the system at the console prompt each time the system is turned on, when the system crashes, or when you press the Halt button.

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

3. Set the `boot_reset` variable to on. This must be done if you need to reboot the generic kernel (`genvmunix`) at any time to reconfigure your system for additional peripherals.

```
>>> set boot_reset on
```

4.6.2 Booting from the CD-ROM Optical Disc Kit

If your CD-ROM optical disc is not already in a caddy, follow the instructions in Appendix A.

Use the following procedure to boot the system:

1. Insert the CD-ROM optical disc labeled *Disc 1 - DEC OSF/1 Operating System V3.2*.
2. Enter the following command to determine the unit number of the drive for your device:

```
>>> show dev
```

A display appears showing information about the devices on your system. For example:

```
dka0.0.0.5.0      DKA0      RZ73
dkb4.4.1.14.0     DKB400    RRD43
```

The numbers in the middle column are the unit numbers assigned to each drive on your system, where:

- The letters DK refer to a SCSI CD-ROM or disk device
 - The third letter (A, B, C, D, or E) refers to the SCSI bus designation (refer to the hardware owner's guide for more details)
 - The numbers refer to the drive number
3. Enter the `boot` command with the following syntax to boot from a CD-ROM:

```
boot device-number
```

For example, to boot the system from CD-ROM drive number 4, enter:

```
>>> boot dkb400
```

The system displays output similar to the following:

```
Initializing...
```

```
F E D C B A 9 8 7 6 5 4 3 2 1 0 NODE #
      A M M . . . . . P TYP
      o + + . . . . . + ST1
      . . . . . . . . . B BPD
      o + + . . . . . + ST2
      . . . . . . . . . B BPD
```

```

      + + + . . . . + ST3
      . . . . . . . . B BPD

+ . + . + . + . . + . . . . C0 XMI +

. A0 B0 . . . . LV
. 256 64 . . . . 320Mb

Firmware Rev = V2.3  SROM Rev = V2.0  SYS SN = GA12345678

Booting...
Connecting to boot device dkb400
.
.
.

```

You have completed booting your system. Continue the installation procedure with Chapter 5.

4.6.3 Booting from the Network

Booting from the network is not supported for the DEC 7000 and DEC 10000 processors.

4.7 AlphaStation 200 4/233 and 4/166 and AlphaStation 400 4/233 Processors

The following sections describe how to boot an AlphaStation 200 4/233 and 4/166 and an AlphaStation 400 4/233 processor from a CD-ROM optical disc and from the network.

4.7.1 Setting the Console Flags

Before starting the boot procedure on an AlphaStation 200 4/233 and 4/166 or AlphaStation 400 4/233 processor, complete the following steps:

1. Enter the following command to clear the `bootosflags` variable to ensure that the correct kernel file boots automatically:


```
>>> set boot_osflags ""
```
2. Set the `autoaction` variable to `halt`. This will halt the system at the console prompt each time the system is turned on, when the system crashes, or when you press the `Halt` button.

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

4.7.2 Booting from the CD-ROM Optical Disc Kit

If your CD-ROM optical disc is not already in a caddy, follow the instructions in Appendix A.

Follow this procedure to boot the system:

1. Insert the CD-ROM optical disc labeled *Disc 1 - DEC OSF/1 Operating System V3.2*.
2. Enter the following command to determine the unit number of the drive for your device:

```
>>> show dev
```

The system displays a device information table similar to the following:

dka0.0.0.6.0	DKA0	RZ25L 0003
dka100.1.0.6.0	DKA100	RZ26 T386
dka400.4.0.6.0	DKA400	RRD43 2893
dva0.0.0.0.1	DVA0	
ewa0.0.0.11.0	EWA0	08-00-2B-E2-74-32
pka0.7.0.6.0	PKA0	SCSI Bus ID 7

The second column shows the numbers assigned to each drive, where:

- The letters DK refer to a SCSI disk or CD-ROM device
 - The letters MK refer to a SCSI magnetic tape device
 - The third letter (A, B, C, D, or E) refers to the SCSI bus designation (refer to the hardware owner's guide for more details).
 - The number refers to the drive number
3. Enter the init command with the following syntax:

```
>>> init
```

4. Enter the boot command with the following syntax to boot from a CD-ROM:

```
boot device
```

For example, to boot the system from CD-ROM drive number 1, enter the following command:

```
>>> boot dka400
```

The system displays output similar to the following:

```
(boot dka400.4.0.6.0)
block 0 of dka400.4.0.6.0 is a valid boot block
reading 16 blocks from dka400.4.0.6.0
bootstrap code read in
base = 11e000, imagestart = 0, imagebytes = 2000
initializing HWRPB at 2000
initializing page table at 110000
initializing machine state
```

```
setting affinity to the primary CPU
jumping to bootstrap code
```

```
OSF boot - Tue Jan 03 17:18:57 EDT 1995
```

You have completed booting your system. Continue the installation procedure with Chapter 5.

4.7.3 Booting from the Network

To boot your system over the network, make sure it is registered as a client on a RIS server. Refer to *Sharing Software on a Local Area Network* for information about registering a client. The client must be on the same subnet as the server.

The device parameter is the network device from which you want to boot. The AlphaStation 200 4/233 and 4/166 and AlphaStation 400 4/233 supports two network adapters: `ewa0` and `ena0`.

Set your device protocols to allow booting from either a DEC OSF/1 server or an ULTRIX server.

4.7.3.1 Booting from a DEC OSF/1 Server

Use the following command syntax to boot your system over the network:

```
set device_protocols bootp
set device_inet_init bootp
```

For example, if the device you are booting from with the `bootp` protocol is `ewa0`, enter the following commands:

```
>>> set ewa0_protocols bootp
>>> set ewa0_inet_init bootp
>>> boot ewa0
```

You can override a previously set boot protocol. For example, if your system was previously set to use the `mop` boot protocol, you can override it and use the `bootp` protocol by entering the following command:

```
>>> boot ewa0 -pro bootp
```

The installation software displays some system information followed by the memory and hardware configurations.

If your initial network boot fails, enter `init` at the console prompt. If you encounter other problems during the RIS installation, refer to *Sharing Software on a Local Area Network* for more information.

You have completed booting your system. Continue the installation procedure with Chapter 5.

4.7.3.2 Booting from an ULTRIX Server

If you are booting from an ULTRIX server, use the following command syntax:

```
set device_protocols mop
```

For example, if the device you are booting from with the mop protocol is `ewa0`, enter the following commands:

```
>>> set ewa0_protocols mop  
>>> boot ewa0
```

If your initial network boot fails, enter `init` at the console prompt. If you encounter other problems during the RIS installation, refer to *Sharing Software on a Local Area Network* for more information.

The installation software displays some system information followed by the memory and hardware configurations.

You have completed booting your system. Continue the installation procedure with Chapter 5.

4.8 AlphaServer 1000 4/200 Processor

This section provides instructions for booting an AlphaServer 1000 4/200 processor.

4.8.1 Setting the Console Flags

Before starting the boot procedure on an AlphaServer 1000 4/200 processor, complete the following steps:

1. Clear the `boot_osflags` variable. This ensures that the correct kernel file boots automatically.

```
>>> set boot_osflags
```

2. Set the `auto_action` variable to `halt`. This will halt the system at the console prompt each time it is turned on, when it crashes, or when you press the Halt button.

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

3. Set the `boot_file` variable. This ensures that an alternate boot file is not set.

```
>>> set boot_file
```

4.8.2 Booting from the CD-ROM Optical Disc Kit

Follow these steps to boot the AlphaServer 1000 4/200 processor from a CD-ROM optical disc:

1. Insert the CD-ROM optical disc labeled *Disc 1 - DEC OSF/1 Operating System V3.2*.
2. Enter the following command to determine the unit number of the drive for your device:

```
>>> show device
```

The `show device` command will display output similar to the following:

dka400.4.0.6.0	DKA400	RRD43	2893
dva0.0.0.0.1	DVA0		
ewa0.0.0.13.0	EWA0	08-00-2B-3E-B6-C8	
pka0.7.0.6.0	PKA0	SCSI Bus ID 7	

3. When the device table is displayed, look for the line with the CD-ROM device string `RRD43`. The device boot string for your system appears in that same line. The device boot string begins with the letters `DKA`.
4. Enter the `boot` command and the appropriate boot device string for your system. For example:

```
>>> boot DKA400
```

For more information about the `show device` and `boot` commands, see the hardware documentation that comes with your system.

4.8.3 Booting from the Network

To boot an AlphaServer 1000 4/200 system over the network, make sure it is registered as a client on a RIS server. Refer to the *Sharing Software on a Local Area Network* guide for information on registering a client. Note that the client must be on the same subnet as the server.

Set your device protocols to allow booting from either a DEC OSF/1 server or an ULTRIX server.

To boot from a DEC OSF/1 Server, see Section 4.8.3.1. To boot from an ULTRIX server, see Section 4.8.3.2.

4.8.3.1 Booting from a DEC OSF/1 Server

Use the `show device` command to determine which network adapter (such

as ewa or era) your system is using:

```
>>> show device
```

The `show device` command will display output similar to the following:

```
dka400.4.0.6.0          DKA400          RRD43  2893
dva0.0.0.0.1           DVA0
ewa0.0.0.13.0          EWA0            08-00-2B-3E-B6-C8
pka0.7.0.6.0           PKA0            SCSI Bus ID 7
```

Use the following command syntax to boot your system over the network:

```
set device_inet_init bootp
set device_protocols bootp
```

For example, if the device you are booting from with the `bootp` protocol is `ewa0`, enter the following commands:

```
>>> set ewa0_inet_init bootp
>>> set ewa0_protocols bootp
>>> boot -fi "" ewa0
```

You have completed booting your system. Continue the installation procedure with Chapter 5.

4.8.3.2 Booting from an ULTRIX Server

Use the `show device` command to determine which network adapter your system is using. The network adapter will have a value such as `ewa0` or `era0`.

```
>>> show device
```

The `show device` command will display output similar to the following:

```
dka400.4.0.6.0          DKA400          RRD43  2893
dva0.0.0.0.1           DVA0
ewa0.0.0.13.0          EWA0            08-00-2B-3E-B6-C8
pka0.7.0.6.0           PKA0            SCSI Bus ID 7
```

Use the following command syntax to boot your system over the network:

```
set device_protocols mop
```

For example, if the device you are booting from with the `mop` protocol is `ewa0`, enter the following command:

```
>>> set ewa0_protocols mop
>>> boot -fi "" ewa0
```

You have completed booting your system. Continue the installation procedure with Chapter 5.

4.9 Digital AXPvme 64 and Digital AXPvme 160 Processors

This section provides instructions for booting Digital AXPvme 64 and Digital AXPvme 160 processors.

4.9.1 Setting the Console Flags

Before starting the boot procedure, complete the following steps:

1. Clear the `boot_osflags` variable. This ensures that the correct kernel file boots automatically.

```
>>> set boot_osflags
```

2. Set the `auto_action` variable to `halt`. This will halt the SBC at the console prompt each time the SBC is turned on, when the SBC crashes, or when you press the Halt button.

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

3. Set the `boot_file` variable. This ensures that an alternate boot file is not set.

```
>>> set boot_file
```

4.9.2 Booting from the Network

To boot your SBC over the network, make sure it is registered as a client on a RIS server. Refer to *Sharing Software on a Local Area Network* for information on registering a client. Note that the client must be on the same subnet as the server.

Set your device protocols to allow booting from either a DEC OSF/1 server or an ULTRIX server.

4.9.2.1 Booting from a DEC OSF/1 Server

Use the `show device` command to determine which network adapter your system is using. The network adapter will have a value such as `ewa0` or `era0`.

```
>>> show device
```

The `show device` command will display output similar to the following:

```
dka200.2.0.2.0      DKA200      RZ26  T392
dka400.4.0.2.0      DKA400      RRD42 4.5d
ewa0.0.0.1.0        EWA0        08-00-2B-39-88-3A
pka0.7.0.2.0        PKA0        SCSI Bus ID 7
```

Use the following command syntax to boot your system over the network:

```
set device_inet_init bootp
set device_protocols bootp
```

For example, if the device you are booting from with the bootp protocol is `ewa0`, enter the following commands:

```
>>> set ewa0_inet_init bootp
>>> set ewa0_protocols bootp
>>> boot ewa0
```

You have completed booting your system. Continue the installation procedure with Chapter 5.

4.9.2 Booting from an ULTRIX Server

Use the `show device` command to determine which network adapter your system is using. The network adapter will have a value such as `ewa0` or `era0`.

```
>>> show device
```

The `show device` command will display output similar to the following:

```
dka200.2.0.2.0      DKA200      RZ26  T392
dka400.4.0.2.0      DKA400      RRD42 4.5d
ewa0.0.0.1.0        EWA0        08-00-2B-39-88-3A
pka0.7.0.2.0        PKA0        SCSI Bus ID 7
```

Use the following command syntax to boot your system over the network:

```
set device_protocols mop
```

For example, if the device you are booting from with the mop protocol is `ewa0`, enter the following command:

```
>>> set ewa0_protocols mop
>>> boot ewa0
```

You have completed booting your system. Continue the installation procedure with Chapter 5.

4.10 Digital AXPpci 33 Processor

This section provides instructions for booting a Digital AXPpci 33 processor.

4.10.1 Setting the Console Flags

Before starting the boot procedure on a Digital AXPPci 33 processor, complete the following steps:

1. Clear the `boot_osflags` variable. This ensures that the correct kernel file boots automatically.

```
>>> set boot_osflags
```

2. Set the `auto_action` variable to `halt`. This will halt the SBC at the console prompt each time it is turned on, when it crashes, or when you press the Halt button.

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

3. Set the `boot_file` variable. This ensures that an alternate boot file is not set.

```
>>> set boot_file
```

4.10.2 Booting from the Network

To boot your Digital AXPPci 33 SBC over the network, make sure it is registered as a client on a RIS server. Refer to *Sharing Software on a Local Area Network* for information on registering a client. Note that the client must be on the same subnet as the server.

Set your device protocols to allow booting from either a DEC OSF/1 server or an ULTRIX server.

4.10.2.1 Booting from a DEC OSF/1 Server

Use the `show device` command to determine which network adapter your system is using. The network adapter will have a value such as `ewa0` or `era0`.

```
>>> show device
```

The `show device` command will display output similar to the following:

dka200.2.0.2.0	DKA200	RZ26 T392
dka400.4.0.2.0	DKA400	RRD42 4.5d
ewa0.0.0.1.0	EWA0	08-00-2B-39-88-3A
pka0.7.0.2.0	PKA0	SCSI Bus ID 7

Use the following command syntax to boot your system over the network:

```
set device_inet_init bootp  
set device_protocols bootp
```

For example, if the device you are booting from with the bootp protocol is

ewa0, enter the following commands:

```
>>> set ewa0_inet_init bootp
>>> set ewa0_protocols bootp
>>> boot ewa0
```

You have completed booting your system. Continue the installation procedure with Chapter 5.

4.10.2.2 Booting from an ULTRIX Server

Use the `show device` command to determine which network adapter your system is using. The network adapter will have a value such as `ewa0` or `era0`.

```
>>> show device
```

The `show device` command will display output similar to the following:

dka200.2.0.2.0	DKA200	RZ26 T392
dka400.4.0.2.0	DKA400	RRD42 4.5d
ewa0.0.0.1.0	EWA0	08-00-2B-39-88-3A
pka0.7.0.2.0	PKA0	SCSI Bus ID 7

Use the following command syntax to boot your system over the network:

```
set device_protocols mop
```

For example, if the device you are booting from with the mop protocol is `ewa0`, enter the following command:

```
>>> set ewa0_protocols mop
>>> boot ewa0
```

You have completed booting your system. Continue the installation procedure with Chapter 5.

4.10.3 Booting Considerations

Debugging information printed during the system boot phase may cause the internal ring message buffer to be overwritten. This results in not all messages being saved in the `/usr/var/adm/syslog.dated` directory.

4.10.4 Booting from a PCI Tulip or ISA LeMAC Ethernet Card

To boot over the DE435 (PCI TULIP) Ethernet card using bootp protocol, use following sequence of command after you have configured your boot server.

```
>>> set ewa0_inet_init bootp
>>> set ewa0_protocols bootp
>>> boot ewa0
```

Similarly, when using DE205 (ISA LeMAC) Ethernet card, use

```
>>> set ena0_inet_init bootp
>>> set ena0_protocols bootp
>>> boot ena0
```

Performing the Full Installation **5**

This chapter describes how to perform the basic and advanced full installations.

Whether you are performing a basic or an advanced installation, you need to complete the tasks described in Section 5.4 through Section 5.7. Up to that point, the basic and advanced installations follow similar paths by requiring you to specify a system disk and reboot the system. After Section 5.7, the installation procedures diverge.

Review Chapter 1 to understand what is offered with each type of installation. Remember that neither the basic nor advanced installation preserves system customizations (that is, user or data files) because the `root`, `usr`, and `var` file systems are destroyed (overwritten) during the process.

If you intend to perform the advanced installation, and want to select your own disk partitions, review Chapter 3 to verify that you have enough disk space and that the disk partitions meet your needs. Refer to Table 3-2 and Table 3-5 for this information. Refer to Appendix F for a sample basic installation log file and Appendix G for a sample advanced installation log file.

Throughout the installation procedure you are prompted for information about the installation. Some prompts have a default response that is shown by brackets surrounding a letter, for example, `[y]`. Press the Return key to accept the default response or enter the letter that corresponds to the option you want. If there is no default response, enter the appropriate option number or letter at the prompt and press the Return key.

Note

The following messages are displayed when rebooting the kernel during the installation. The following messages can be ignored:

```
vm_swap_init: warning /sbin/swapdefault swap device not found
vm_swap_init: in swap over commitment mode
```

5.1 Preparing for a Full Installation if Using LSM

Read this section only if your system is installed with and using the Logical Storage Manager (LSM) and you are performing a full installation.

The following steps should be performed to preserve the LSM configuration currently in use on a system. Steps 2 and 4 are not necessary when performing an update installation because the update preserves the LSM `volboot` file in the `root` file system.

1. Check the `/etc/vol/volboot` file to ensure that it contains valid LSM disks. Enter the following command to list the current disks in `/etc/vol/volboot`

```
# voldctl list
```
2. Create a backup copy of the `/etc/vol/volboot` file. The backup copy of `/etc/vol/volboot` must be restored after the installation is complete. The backup copy should be created on a separate file system that is not located in either the `root` `/usr` or `/var` file systems because a full installation destroys (overwrites) those three file systems. In the following example, `/backup` is a separate file system:

```
# mkdir /backup/lsm  
# cp /etc/vol/volboot /backup/lsm/volboot
```

3. Save the current LSM configuration information for added safety. Create a backup copy of the current LSM configuration. The backup copy should be created on a separate file system that is not located in either the `root` `/usr` or `/var` file systems because a full installation destroys (overwrites) those three file systems. In the following example, `/backup` is a separate file system:

- a. Save information regarding the disks currently being used with LSM. For example:

```
# voldisk list > /backup/lsm/voldisk.out
```

- b. Save the LSM diskgroup configuration. For example, enter the following command for each LSM diskgroup in the configuration. The backslashes (`\`) in the following two command line examples indicate line continuation and should not be included in the actual command line:

```
# volprint -g rootdg -mvps > \  
/backup/lsm/volprint.rootdg.out
```



```
# volprint -g diskgroup-mvps > \  
/backup/lsm/volprint.diskgroup.out
```

The backup files created in the previous steps should also be copied to a backup media (i.e., tape) before the installation is started for added safety. These configuration files do not need to be restored under normal circumstances; restoring the `/etc/vol/volboot` file from backup has sufficient information for the LSM configuration.

4. Perform the installation process as documented in this chapter.
5. After the full installation is complete, restore the backed copies of the LSM `volboot` file before starting LSM. For example, while in multi-user mode, enter commands similar to the following:

```
# cp /backup/lsm/volboot /etc/vol/volboot  
# volinstall  
# rm -f /etc/vol/reconfig.d/state.d/install-db  
# vol-startup
```

After the full installation, the `/usr` and `/var` file systems reside on disk partitions. Separate steps are required to encapsulate the disk partitions to LSM volumes. Before the current `/usr` and `/var` file systems can be encapsulated to LSM volumes, a cleanup of the LSM configuration that existed before the full installation has to be done. If either the `/usr` or `/var` file systems resided on LSM volumes before the full installation, you will have to clean up these LSM volumes because the LSM volumes will no longer be in use.

Refer to Section 6.10.7 for more details about how to clean up unused LSM volumes. Refer to the *Logical Storage Manager* guide for more information about LSM.

5.2 Preparing for a Full Installation if Using LVM

Read this section only if your system is installed with and using the Logical Volume Manager (LVM) and you are performing a full installation.

The following steps should be performed to preserve the LVM configuration currently in use on a system:

1. Create a backup copy of the LVM configuration. The backup copy should be created on a separate file system that is not located in either the `root`, `/usr` or `/var` file systems because a full installation destroys (overwrites) those three file systems. In the following example,

`/backup` is a separate file system:

```
# mkdir /backup/lvm
# cp /etc/lvmtab /backup/lvm/lvmtab
```

2. Save the current LVM configuration for added safety as shown in the following steps:
 - a. For each LVM volume group in the configuration, enter the following command to back up the volume group information. In this example, `vg1` is the volume group:

```
# vdisplay -v /dev/vg1 > /backup/lvm/vg1.out
```
 - b. For each logical volume in a volume group, execute the following command to back up the configuration information. In this example, `lvoll` is the logical volume and `vg1` is the volume group:

```
# ldisplay -v /dev/vg1/lvoll > /backup/lvm/vg1.lvoll.out
```
 - c. For each physical volume in a volume group, execute the following command to back up the configuration information for each physical volume in the volume group. In this example, `/dev/rz8c` is the physical volume:

```
# pdisplay -v /dev/rz8c > /backup/lvm/vg1.rz8c.out
```
3. Perform the full installation of DEC OSF/1 as described in this chapter.
4. After the full installation is complete, restore the copy of `/etc/lvmtab` from the backup media as shown in this example:

```
# cp /backup/lvm/lvmtab /etc/lvmtab
```

Restoring the `/etc/lvmtab` file has sufficient information for a complete LVM configuration. The LVM configuration files that were backed up in Step 2 were backed for added safety and do not have to be restored. LVM volume groups can now be reenabled with the `vgchange` command.

5.3 Preparing for a Full Installation if Using Prestoserve

Read this section only if your system is using Prestoserve and you are performing a full installation.

You must save your current Prestoserve configuration before beginning a full installation because the `root` file system is overwritten during a full installation. To save and restore the Prestoserve configuration, follow these steps:

1. Create a backup copy of the `/etc/prestotab` file. The backup copy should be created on a separate file system that is not located in either the

root, /usr, or /var file systems because a full installation destroys (overwrites) those three file systems. In the following example, /backup is a separate file system:

```
# mkdir /backup/presto
# cp /etc/prestotab /backup/presto/prestotab
```

2. Perform the full installation of DEC OSF/1 as described in this chapter.
3. After the full installation is complete, restore the copy of /etc/prestotab from the backup as shown in this example:

```
# cp /backup/presto/prestotab /etc/prestotab
```

To configure the prestoserve software, refer to `prestosetup(8)` or `setup(8)` for more information.

5.4 Choosing the Type of Installation

To begin an installation you must have shut down and booted your processor as described in Chapter 4.

The first step of the procedure is to specify which type of installation you want to perform. After your system boots, it displays brief installation information and a menu similar to the following:

```
*** STANDALONE SYSTEM ENVIRONMENT ***
```

```
Select the BASIC option to install the mandatory
software subsets for your system configuration.
```

```
Select the ADVANCED option to display optional
software subsets from a menu and/or customize
system disks and partitions.
```

```
Select the SYSTEM MANAGEMENT option to customize disk
partitions on the system disk.
```

```
Select one of the following options:
```

- 1) BASIC Installation
- 2) ADVANCED Installation
- 3) SYSTEM MANAGEMENT

Enter your choice:

Enter the option number of the installation type you want to perform and press Return.

If you chose the SYSTEM MANAGEMENT option, refer to Chapter 7 for more information.

5.5 Things to Consider when Choosing the System Disk

The installation procedure requires that you specify a system disk. The system disk contains the `root` file system. The following sections provide information you may need to consider when choosing your system disk. After reading these sections, proceed to Section 5.6 to choose your system disk from the system disk table.

5.5.1 Disks Used on ULTRIX Systems

Read this section if you intend to use a disk that was previously used on a system running ULTRIX.

During the installation the following message might appear:

```
rzn: using ULTRIX partition info found on disk.
```

In the display, `n` in the string `rzn` would be replaced by the SCSI drive identifier.

You can ignore this message. The message is informational and notes whether the disk being targeted has ULTRIX partition information.

5.5.2 Disk Labels on Existing System Disks

The disk selected to be the system disk always has a new disk label written to it, regardless of whether one already exists or not. This ensures that a valid bootstrap exists on the disk. Without one, the disk is not bootable.

Before writing a new disk label, the disk is checked for a pre-existing disk label. If none is found (typical for a never before used disk), a disk label is written using the default partition information. If a disk label is found, several different scenarios can occur:

- During a basic installation, the default partition information is used and it does not matter if a disk label already exists or contains partition information different from the default partition information.
- During an advanced installation, if no disk label exists, a disk label containing the default partition information is used. If a disk label does exist, its partition information is compared to the default partition information. If they differ, the installer can choose one or the other.

If an existing disk label is selected, it is saved and rewritten to the disk. The new disk label is identical to the previous disk label. If the default disk label is selected, a disk label containing the default partition information is used. If it is determined that the existing disk label had partition information that matched the defaults, a new disk label that contains the default partition information is used.

5.5.2.1 Preserving Data on an Existing System Disk

During an advanced installation, you can choose the partitions on which `root`, `swap`, `usr`, and `var` will be located. If the partitions that contain data to be preserved are chosen during the installation for `root`, `swap`, `usr`, or `var`, the data will be lost. Selecting a partition that overlaps the partition(s) containing the data to be preserved has the same effect. Also, modifying the partition information in the disk label in such a way that the partition(s) containing data have their size and/or offset modified will cause the data to be lost. However, if the partitions containing the data are undisturbed, the contents of them should be recoverable.

Assuming that the partition(s) to be preserved were undisturbed during the advanced installation, the partitions can be used on the newly installed system. If the partition contained a file system, it should be capable of being mounted and accessed. However, unless the installation used the custom partition information that existed on the disk prior to the installation, the disk label may not correctly show the existence of the pre-existing file systems. In situations where the disk label used had the default partition information, the `fstype` field for all partitions is reset to `unused`. Only those partitions selected during the installation will have values different from `unused`. To avoid the confusion that the inaccurate disk label may create, use the following command to edit the disk label and modify the `fstype` field:

```
disklabel -e
```

You might also need to modify the `fsize`, `bsize`, and `cpq` fields for the partition(s). These fields vary depending on the type of file system built on the partition. If you have a copy of the disk label that existed before the installation, you can determine the value of the fields from that label.

5.5.3 Disk Size Restrictions

Disks that do not have partitions large enough to hold the `root` and `/usr` file systems are marked with an asterisk next to the entry under the `Software Name` header in the system disk table. This table is explained in Section 5.6. As an example, RZ55 and RZ24L disks have a partitions large enough to contain the `root` file system, but neither disk has a `g` (or other) partition large enough for the `/usr` file system. Neither disk type is able to hold all file systems and another disk is required.

This is not a problem during advanced installations because you have the opportunity to select different disks and partitions. If you choose to do an advanced installation, you can, for example, use RZ55 and RZ24L disks as required and allocate `/usr` (and other) file systems to other disks and disk partitions on your system.

The basic installation uses only default partitions and puts all file systems on a single system disk. Therefore, disk types such as the RZ55 and RZ24L cannot be used for a basic installation.

If you are doing a basic installation, and you try to install on a disk that is too small to hold the root partition, you will see a message similar to the following:

```
You selected RZ55, device number 10. This device is not
supported for BASIC installations.
```

```
Select one of the following courses of action:
```

- 1) Perform ADVANCED installation to rz10
- 2) Select another drive
- 3) Exit the Installation

```
Enter your choice:
```

If you select option 1, you can use the advanced installation procedure to allocate partitions on other disks for the `/usr` and other file systems. Review Chapter 1 and read Chapter 3 before you proceed with the advanced installation.

Option 2 lets you choose a different disk. You must choose a disk large enough to contain root, swap, and `/usr` to continue the basic install or the same message is repeated. If you have another disk, and you are certain that it has a partition that is large enough to hold the root, swap, and `/usr`, you can choose this option and proceed with the installation. Consult Appendix D and the *Release Notes* to ensure that the disk you choose has enough space.

If you need to review the disks available on your system and do some disk planning, select option 3 to exit the installation at this time. Begin the installation again when you have collected the information that you need.

5.6 System Disk Table

The system disk table lists the disks connected and available to your processor. You must choose a disk on this table to be the system disk that will contain the `root` file system. The system disk table lists the following information about each disk:

- Selection number associated with each possible system disk
- Device name for each disk
- Software name for each disk
- Device number of each disk
- Controller name associated with each disk

- Controller number associated with each disk

For example, the following table might be displayed if you are installing a DEC 3000 Series processor. Enter the selection number of the disk where you want to locate the root file system.

*** SYSTEM DISK SELECTION ***

The Installation Guide explains the following table of system disk drives. Select one of the disks in the table to contain the root file system:

SYSTEM DISK TABLE

Selection	Device Name	Software Name	Device Number	Controller Name	Controller Number
1	RZ26L	rz0	0	SCSI	0
2	RZ26	rz3	3	SCSI	0
3	RZ58	rz8	8	SCSI	1

Enter your choice: 3

After you enter your selection number, you are asked to make sure the disk drive is on line and write enabled, and to confirm your choice.

You selected RZ58, device number 8. Make sure this disk drive is online and write-enabled (if applicable to your disk drive), then confirm your choice.

Use RZ58, rz8, for your system disk? (y/n) []: y

If you decide not to use the device you selected, enter n at the prompt. The system redisplays the table and you can reenter your choice.

5.6.1 Selecting File System Type for root

This section applies only if you chose the advanced installation.

After you select the disk to be used for your system disk, you are asked to choose between the UNIX File System (UFS) or the POLYCENTER Advanced File System (AdvFS) as the file system type for the root file system. You also have this option for the /usr and /var file systems later on in the installation.

The POLYCENTER Advanced File System (AdvFS) is a journaled local file system that provides higher availability and greater flexibility than traditional UNIX file systems. Using transaction journaling, AdvFS recovers file domains in seconds rather than hours after an unexpected restart such as a power failure. AdvFS journaling also provides increased file system integrity. AdvFS provides greater flexibility by allowing filesets (file systems) to share a single storage pool and enabling hard and soft fileset quotas in addition to user and group quotas. AdvFS supports a maximum file size of 128 GB.

Refer to the *System Administration* guide or the *POLYCENTER Advanced File System Utilities Technical Summary* for more information about AdvFS.

UFS has a more rigid hierarchy than AdvFS. In a UFS file system, each disk (or disk partition) contains one separate file system. The UFS file system is characterized by a hierarchical structure, the ability to create and delete files, dynamic growth of files, the protection of file data, and the treatment of peripheral devices.

UFS is compatible with the Berkeley 4.3 Tahoe release. UFS allows a pathname component to be 255 bytes, with the fully qualified pathname length restriction of 1023 bytes. The DEC OSF/1 implementation of UFS supports a maximum file size equivalent to the largest supported file system (128 GB).

Refer to the *System Administration* guide for more information about UFS.

The following message allows you to select either AdvFS or UFS as the file system type for root:

```
You can select to use the UNIX File System (ufs) or the Advanced
File System (advfs) for the root file system. See the Installation
Guide for further information.
```

```
Select the file system type for the root file system (advfs/ufs)
[ufs]: advfs
```

After you select the file system type for root, system disk initialization begins, and you will see output similar to the following:

```
Initializing the system disk RZ58, rz8...
Working...Tue Jan 03 21:20:49 GMT 1995
Working...Tue Jan 03 21:22:52 GMT 1995
```

5.6.2 ULTRIX Partition Tables

This section applies only if you chose the advanced installation. If the disk you choose to contain the root file system was previously used on an ULTRIX system, it will be formatted with ULTRIX partition tables. You will see a message similar to the following:

```
ULTRIX compatible partition data found.
This data may be different than the standard
partition layout information in /etc/disktab.
```

ULTRIX partition table layout is:

partition	bottom	top	size	overlap
a	0	40959	40960	c,h
b	40960	163839	122880	c
c	0	832526	832527	a,b,d,e,f,g,h
d	163840	386735	222896	c,g
e	386736	609631	222896	c,g
f	609632	832526	222895	c,g
g	163840	832526	668687	c,d,e,f
h	0	0	0	a,c

Use the ULTRIX-style partition data? [y]:

If you enter *y* to use the ULTRIX layout, a DEC OSF/1 disk label will be created for the disk. This label will correspond to the existing ULTRIX partition table. If you enter *n*, the default partitions for DEC OSF/1 will be created.

5.6.3 Selecting Disk Partitions

If you chose the advanced installation and you already have nonstandard disk partitions on the system disk, you are asked to choose either your nonstandard partitions or the system's default partitions.

Note

You will not see this information unless the existing disk label is different from the default disk label. Refer to Section 5.5.2 for more information about disk labels on system disks.

If you have carefully planned your partition layout and you want to keep the partitions you have on the disk, choose the existing partition table. Partition sizes are shown in blocks. Depending on your choice to the prompt shown in the following example, the partition table shows either the default partition table or the existing partition table and asks you to confirm your choice:

Select one of the following partition tables to be displayed
for the system disk rz0 RZ26:

- 1) Default Disk Label
- 2) Existing Disk Label

Enter your choice: 1

The following table shows the default disk partitions.

partition	start	size	end	overlap
a ----	0	131072	131072	c
b ----	131072	262144	393216	c
c ----	0	2050860	2050860	a, b, d, e, f, g, h
d ----	393216	552548	945764	c, g
e ----	945764	552548	1498312	c, g, h
f ----	1498312	552548	2050860	c, h
g ----	393216	819200	1212416	c, d, e
h ----	1212416	838444	2050860	c, e, f

Are these the partitions you want? (y/n) [y]:

Enter *y* at the prompt to use the partition table that is displayed or enter *n* at the prompt to display the alternate choice (depending upon your initial choice, either the default or existing disk label).

After you enter and confirm your choice, the system displays a message that it is initializing the system disk.

Your output will be similar to the following:

```
Working...Tue Jan 03 21:20:49 GMT 1995
Working...Tue Jan 03 21:22:48 GMT 1995
Working...Tue Jan 03 21:24:30 GMT 1995
```

5.7 Rebooting the System

After restoring the root file system to the a partition, the installation procedure displays the boot command sequence that you must enter to reboot your system. The screen displays the `boot_osflags` variable, the `bootdef_dev` variable and the `boot` command that you must enter to reboot your system. At the console prompt (`>>>`), enter the boot command sequence exactly as shown on your screen.

The following example shows a remote installation (using Remote Installation Services [RIS]), so the name of the remote server (`ds9`) is displayed. Your screen will look similar to the following (the actual boot commands are not included here to ensure that you do not enter the boot commands shown in this guide):

```
*** BOOTSTRAP COMMAND SEQUENCE ***
Distribution source is remote server ds9
The system disk has been initialized.

Issue the following console commands to set your default bootpath
variable and to boot your system disk to multiuser:

>>>
>>>
>>>
```

Write down the boot commands shown on your screen in case you need them again:

- >>>
- >>>
- >>>

The system displays informational messages, the memory and hardware configurations, and a message informing you that the DEC OSF/1 installation is continuing.

At this point, the basic and advanced installation procedures diverge. If you selected the advanced installation, continue with Section 5.8.

If you selected the basic installation, the system displays a message telling

you the location of the /usr file system and the swap space. For example:

```
***** CREATING DEFAULT FILE SYSTEMS
```

```
The default location for the /usr file system is rz8g
The default location for the var area is rz8g (in /usr)
The default location for the swap space is rz8b
The default filesystem type for /usr is ufs (UNIX File System)
```

```
Making the new file system for /usr on rrz8g RZ26
Working....Tue Jan 03 17:45:35 GMT 1995
```

Proceed to Section 5.9 to continue the basic installation procedure.

5.8 Allocating File Systems for the Advanced Installation

This section applies only if you are performing an advanced installation.

The system disk you chose contains the root file system on partition a. A message is displayed telling you the default location for the /usr file system and swap space and you are asked if you want to use these defaults. To accept the defaults, enter *y* at the prompt. For example:

```
***** SELECT FILE SYSTEMS
```

```
The default location for the /usr file system is rz8g
The default location for the var area is rz8g (in /usr)
The default location for the swap space is rz8b
The default filesystem type for /usr is ufs (UNIX File System)
```

```
Would you like to use these defaults? (y/n): y
```

```
Making the new file system for /usr on rrz8g RZ26
Working....Tue Jan 03 17:45:35 GMT 1995
```

If you entered *y* to accept the defaults, continue with Section 5.9.

If you do not want to accept the defaults, enter *n* at the prompt and continue with Section 5.8.1.

5.8.1 Allocating the /usr File System

If you chose not to use the default file system layout, the system displays a table similar to the one in the following example. The table lists the disks connected to your processor. Enter the selection number of the disk on which you want to allocate the /usr file system. Refer to the file system

worksheet, Table 3-5, for the disk name.

*** Allocate the /usr file system

You can allocate the /usr file system to one of the disks listed in the table below. See the Installation Guide for an explanation of this table:

/usr file system ALLOCATION TABLE

Selection	Device Name	Software Name	Device Number	Controller Name	Controller Number
1	RZ26L	rz0	0	SCSI	0
2	RZ26	rz3	3	SCSI	0
3	RZ58	rz8	8	SCSI	1

Enter your choice: 3

You selected RZ58, device number 8. Make sure this disk is online and write-enabled (if applicable), then confirm your choice.

Use RZ58, rz8 for /usr file system? (y/n) []: y

After you confirm your choice, you are asked to choose the partition on which you want to allocate the /usr file system. You are also asked to choose between UFS or AdvFS as the file system type for the /usr file system.

The following example shows partition and file system type selection for /usr:

Select the rz8 partition on which the /usr file system will be mounted:

partition		start	size	end	overlap
b	----	131072	262144	393216	
d	----	393216	768281	1161497	g
e	----	1161497	768282	1929779	g, h
f	----	1929779	768282	2698061	h
g	----	393216	819200	1212416	d, e
h	----	1212416	1485645	2698061	e, f

Enter the letter specifying which partition to use: h

Use rz8 partition 'h' for the /usr file system (y/n) []? y

You can select to use the UNIX File System (ufs) or the Advanced File System (advfs) for the /usr file system. See the Installation Guide for further information.

Select the file system type for the /usr file system (advfs/ufs) [ufs]: advfs

After you confirm your choice of which disk partition you want to use for /usr and enter the file system type for /usr, the system displays a message similar to the following:

```
Making the new file system for /usr on /dev/rrz8h RZ58
```

5.8.2 Allocating the swap Space

Next, you must select the disk on which you want to allocate the swap1 space. On systems with more than one disk, Digital recommends that you allocate the primary swap partition on the system disk.

The installation procedure displays a table similar to the one shown in the following example:

```
***           Allocate the SWAP1 space

You can allocate the swap1 space to one of the disks listed in the
table below. See the Installation Guide for an
explanation of this table:
swap1 space ALLOCATION TABLE

Selection  Device      Software   Device     Contoller   Contoller
           Name        Name       Number     Name        Number
-----
      1     RZ26L        rz0        0          SCSI        0
      2     RZ26         rz3        3          SCSI        0
      3     RZ58         rz8        8          SCSI        1
-----

Enter your choice: 2

You selected RZ26, device number 3. Make sure this disk is
online and write-enabled (if applicable), then confirm your choice.
Use RZ26, rz3 for swap1 space? (y/n) []: y
```

After you confirm your choice, you are asked to choose the partition on which you want to allocate the swap1 space. Only the available partitions are listed in the table. (The default choice if you chose to use default partitions, would be partition b of the system disk.) The partition you choose must contain at least 131,072 blocks (64 MB).

Select the rz3 partition on which the swap1 space will be mounted:

partition		start	size	end	overlap
a	----	0	131072	131072	c
b	----	131072	262144	393216	c
c	----	0	2050860	2050860	a, b, d, e, f, g, h
d	----	393216	552548	945764	c, g
e	----	945764	552548	1498312	c, g, h
f	----	1498312	552548	2050860	c, h
g	----	393216	819200	1212416	c, d, e
h	----	1212416	838444	2050860	c, e, f

Enter the letter specifying which partition to use: e

Use rz3 partition 'e' for the swap1 space (y/n) []? y

After you confirm your choice, the system asks if you want to allocate a second swap space. If you do not want to allocate a second swap space, enter n and continue with Section 5.8.3.

If you want to allocate a second swap space, enter y at the prompt. The system displays a table similar to the one shown in the following example. Choose the disk on which you want to allocate the swap2 space or enter 0 (zero) to skip allocating a second swap space.

***** Allocate the SWAP2 Space

Do you want to allocate a second swap space? (y/n) []: y

You can allocate the swap2 space to one of the disks listed in the table below. See the Installation Guide for an explanation of this table:

swap2 space ALLOCATION TABLE

Selection	Device Name	Software Name	Device Number	Controller Name	Controller Number
1	RZ26L	rz0	0	SCSI	0
2	RZ26	rz3	3	SCSI	0
3	RZ58	rz8	8	SCSI	1

Enter your choice OR

Enter 0 to ABORT allocation: 1

You selected RZ26L, device number 0. Make sure this disk is online and write-enabled (if applicable), then confirm your choice.

Use RZ26L, rz0 for swap2 space? (y/n) []: y

After you confirm your choice, you are asked to choose the partition on which you want to allocate the swap2 space. Then, you are asked to confirm your choice. For example:

Select the rz0 partition on which the swap2 space will be mounted:

partition		start	size	end	overlap
a	----	0	131072	131071	c
b	----	131072	262144	393215	c
c	----	0	2050860	2050859	a, b, d, e, f, g, h
d	----	393216	552548	945763	c, g
e	----	945764	552548	1498311	c, g, h
f	----	1498312	552548	2050859	c, h
g	----	393216	819200	1212415	c, d, e
h	----	1212416	838444	2050859	c, e, f

Enter the letter specifying which partition to use: **b**
Use rz0 partition 'b' for the swap2 space (y/n) [**?**] **y**

5.8.3 Allocating the var Area

You can place the `var` area of your system either in the `/usr` file system or on a separate file system.

If the system you are installing is a Dataless Management Services (DMS) server, you should allocate a separate file system for `/var` because all dataless environments reside in `/var/adm/dms` on the server. Putting `/var` under `/usr` could mean that your system will run out of disk space when you create dataless environments. Refer to *Sharing Software on a Local Area Network* for more information about allocating the `/var` area and calculating disk space for DMS environments.

Your screen display will be similar to the following:

```
*****  ALLOCATE THE /var FILE SYSTEM
```

The `/var` area of your system can either be placed in the `/usr` file system or on a separate file system.

Do you want to allocate a separate file system for `/var`? (y/n): **y**

Enter **n** at the prompt if you do not want to allocate a separate file system for `var` and proceed to Section 5.9.2 to select the software subsets to install. If you want to allocate a separate file system for `var`, enter **y** at the prompt. The system displays a `var` allocation table similar to the one shown in the following example. Choose the disk on which you want to allocate the `var`

area or enter 0 (zero) to skip allocating a separate var area:

You can allocate the /var file system to one of the disks listed in the table below. See the Installation Guide for an explanation of this table:

/var file system ALLOCATION TABLE

Selection	Device Name	Software Name	Device Number	Controller Name	Controller Number
1	RZ26L	rz0	0	SCSI	0
2	RZ26	rz3	3	SCSI	0
3	RZ58	rz8	8	SCSI	1

Enter your choice OR
Enter 0 to ABORT allocation: 1

You selected RZ26L, device number 0. Make sure this disk is online and write-enabled (if applicable), then confirm your choice.

Use RZ26L, rz0 for /var file system? (y/n) []: y

After you confirm your choice about which disk you want to use for the var file system, you are asked to choose the partition on which you want to allocate the /var file system. You are also asked to choose between the UFS or AdvFS as the file system type for var.

Select the rz0 partition on which the /var file system will be mounted:

partition	start	size	end	overlap
a	----	0	131072	131071
d	----	393216	552548	945763 g
e	----	945764	552548	1498311 g, h
f	----	1498312	552548	2050859 h
g	----	393216	819200	1212415 d, e
h	----	1212416	838444	2050859 e, f

Enter the letter specifying which partition to use: g

Use rz0 partition 'g' for the /var file system (y/n) []? y

You can select to use the UNIX File System (ufs) or the Advanced File System (advfs) for the /var file system. See the Installation Guide for further information.

Select the file system type for the /var file system
(advfs/ufs) [ufs]: advfs

Making the new file system for /var on /dev/rrz0g RZ26L

5.9 Installing Software Subsets

At this point, the installation process is ready to install software subsets.

If you performed a basic installation, subset installation occurs automatically. Proceed to Section 5.9.1.

If you performed an advanced installation, you can choose the software subsets you want to install to customize your system. Proceed to Section 5.9.2.

5.9.1 Installing Software Subsets for the Basic Installation

If you chose the basic installation, the installation process automatically installs the DEC OSF/1 mandatory subsets and displays a message similar to the following:

```
*** Loading the operating system software subsets

The installation procedure will now load the software on your
disk partitions. This process will take anywhere between
20 minutes to an hour, depending on your distribution media
and processor type.

You will be presented with a menu of software options in a
few moments.
```

```
Working...Tue Jan 03 21:05:36 GMT 1995
Working...Tue Jan 03 21:07:37 GMT 1995
Working...Tue Jan 03 21:09:37 GMT 1995
Working...Tue Jan 03 21:11:37 GMT 1995
```

If you are performing the installation from CD-ROM, the installation software loads the software from the disc you used to begin the installation. You do not have to change CD-ROM discs.

If your system is a workstation, windowing software is considered mandatory. Copying, working, and verifying messages similar to the following are displayed while the system loads the mandatory subsets:

The following subsets will be installed:

```
Base System
Base System - Hardware Support
Compiler Back End
Kernel Header and Common Files
Standard Kernel Objects
Hardware Kernel Objects
Hardware Kernel Header and Common Files
Basic Networking Services
X Servers
Basic X Environment
X Fonts
DECwindows 100dpi Fonts
Adobe Fonts
NFS(tm) Utilities
```

```
Base System
Copying from ds9 (inet)
Working...Tue Jan 03 21:27:41 GMT 1995
Verifying
Working...Tue Jan 03 21:29:59 GMT 1995
Base System - Hardware Support
Copying from ds9 (inet)
Working...Tue Jan 03 21:30:31 GMT 1995
Verifying
```

```
.  
. .  
.  
Adobe Fonts  
  Copying from ds9 (inet)  
  Verifying
```

```
NFS(tm) Utilities  
  Copying from ds9 (inet)  
  Verifying
```

The installation procedure has successfully installed the software subsets.

System configuration occurs after the software subsets are installed. Proceed to Chapter 6 for information about configuring the system and setting up your system for general use.

5.9.2 Installing Software Subsets for the Advanced Installation

If you chose the advanced installation, the system displays working messages followed by a list of mandatory subsets. If your system is a workstation with windowing capabilities, the windowing subsets are installed automatically.

```
*** Loading the operating system software subsets
```

The installation procedure will now load the software on your disk partitions. This process will take anywhere between 20 minutes to an hour, depending on your distribution media and processor type.

You will be presented with a menu of software options in a few moments.

```
Working...Tue Jan 03 21:05:36 GMT 1995  
Working...Tue Jan 03 21:07:37 GMT 1995  
Working...Tue Jan 03 21:09:37 GMT 1995  
Working...Tue Jan 03 21:11:37 GMT 1995
```

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

The following subsets are mandatory and will be installed by default:

```
Base System  
Base System - Hardware Support  
Hardware Kernel Header and Common Files  
Hardware Kernel Objects  
Kernel Header and Common Files  
POLYCTR advfs Kernel Objects  
Standard Kernel Objects  
Basic Networking Services  
NFS(tm) Utilities  
Compiler Back End  
POLYCTR advfs  
Adobe Fonts  
Basic X Environment  
DECwindows 100dpi Fonts  
X Fonts  
X Servers
```

The POLYCTR subsets are mandatory only if AdvFS was chosen as the file system type for `root`, `/usr`, or `/var`. The Asynchronous Mode Transfer (ATM) Kernel Objects and ATM Commands subsets will become mandatory if ATM hardware is detected on your system.

The system then displays a list of the optional subsets.

Note

All subset dependencies are listed in Appendix B. It is suggested that you review this appendix before choosing your subsets to make sure you install all dependent subsets. The *Release Notes* may also contain information about subset dependencies.

For full System V compatibility, you must install the Software Development Environment (OSFPGMR320) subset; otherwise the `./usr/lib/libsys5.a` symbolic link will not be present.

At the prompt, enter the number or numbers associated with the subsets you want to install. The installation procedure prevents you from putting all subsets on a disk that is not large enough to hold them. To avoid this problem, install only those optional subsets that you actually need. As shown in this example, separate multiple selections with a space (or a comma) and enter consecutive ranges with a hyphen between the two selections:

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.

- General Applications:

- 1) Common Agent
- 2) Computer Aided System Tutor
- 3) GNU Emacs
- 4) Local Area Transport (LAT)
- 5) Logical Storage Manager
- 6) Logical Storage Manager GUI
- 7) Logical Volume Manager
- 8) UNIX(tm) SVID2 Compatibility
- 9) UNIX(tm) to UNIX(tm) Copy Facility

- Kernel Build Environment:

- 10) Logical Storage Manager Kernel Header and Common Files
- 11) Logical Storage Manager Kernel Objects

- Mail Applications:

- 12) DECwindows Mail Interface
- 13) RAND Corp. Mail Handler (MH)

- Network-Server/Communications:

- 14) ATM Commands

- 15) ATM Kernel Objects
- 16) Additional Networking Services
- 17) Dataless Management Services
- 18) Remote Installation Service

--- MORE TO FOLLOW ---

Enter your choices or press RETURN to display the next screen.

Choices (for example, 1 2 4-6): 16-18

- Printing Environment:
 - 19) Adobe Font Metric Files
 - 20) Local Printer Support
- Reference Pages:
 - 21) Ref Pages: Admin/User
 - 22) Ref Pages: Programming
 - 23) Ref Pages: Realtime
 - 24) Ref Pages: Windows Admin/User
 - 25) Ref Pages: Windows Programming
- Software Development:
 - 26) Additional Motif Demo Sources
 - 27) CDA(tm) Software Development
 - 28) CDA(tm) for X/Motif Development
 - 29) DEC C (cc -migrate)
 - 30) GNU Revision Control System
 - 31) LSM Software Development
 - 32) Realtime Software Development
 - 33) Software Development Environment
 - 34) Source Code Control System
 - 35) X Window Software Development
- Supplemental Documentation:
 - 36) XIE Version 5 Online Documentation
- System Administration:
 - 37) C2-Security
 - 38) C2-Security GUI
 - 39) Kernel Debugging Tools
 - 40) Obsolete Commands and Utilities
 - 41) Obsolete Locale databases
 - 42) Single-Byte European Locales
 - 43) System Accounting Utilities
 - 44) System Exercisers
 - 45) Verifier/Exerciser GUI
 - 46) Verifier/Exerciser Tool
- Text Processing:
 - 47) Doc. Preparation Tools
 - 48) Doc. Preparation Tools Extensions
- Windowing Environment:
 - 49) DECwindows 75dpi Fonts
 - 50) X Customizations for OEM
- Windows Applications:
 - 51) Additional DECwindows Applications
 - 52) Additional X Applications

--- MORE TO FOLLOW ---

Add to your choices or press RETURN to display the next screen.

Choices (for example, 1 2 4-6): 16-18 20 47-48 51-52

The following choices override your previous selections:

- 53) ALL mandatory and all optional subsets
- 54) MANDATORY subsets only
- 55) CANCEL selections and redisplay menus

Add to your choices, choose an overriding action or press RETURN to confirm previous selections.

Choices (for example, 1 2 4-6): 16-18 20-25 47-48 51-52

After entering your choice(s), the system displays the following message:

You are installing the following mandatory subsets:

- Base System
- Base System - Hardware Support
- Hardware Kernel Header and Common Files
- Hardware Kernel Objects
- Kernel Header and Common Files
- POLYCTR advfs Kernel Objects
- Standard Kernel Objects
- Basic Networking Services
- NFS(tm) Utilities
- Compiler Back End
- POLYCTR advfs
- Adobe Fonts
- Basic X Environment
- DECwindows 100dpi Fonts
- X Fonts
- X Servers

Next, the system displays your choice of optional subsets and asks you to confirm your choice. For example:

You are installing the following optional subsets:

- Network-Server/Communications:
 - Additional Networking Services
 - Dataless Management Services
 - Remote Installation Service
- Printing Environment:
 - Local Printer Support
- Text Processing:
 - Doc. Preparation Tools
 - Doc. Preparation Tools Extensions
- Windows Applications:
 - Additional DECwindows Applications
 - Additional X Applications

Is this correct? (y/n): y

If the displayed subsets are not the subsets you want to install, enter n. The system redisplay the subset selection menu and you can reenter your choice(s). If the correct subsets are displayed, enter y. The system displays a message saying it is checking to see if there is enough file system space to install the selected subsets. For example:

Checking file system space required to install selected subsets:

File system space checked OK.

The installation procedure temporarily uses root space for logging purposes. This space is reflected in the file system space check. This space is made available after the installation procedure completes.

The system displays the subset name as well as copying, working, and verifying messages similar to the following:

Base System

Copying from ds9 (inet)

Working....Tue Jan 03 21:14:53 GMT 1995

Working....Tue Jan 03 21:16:54 GMT 1995

Verifying

Working....Tue Jan 03 21:19:04 GMT 1995

Base System - Hardware Support

Copying from ds9 (inet)

Working....Tue Jan 03 21:19:36 GMT 1995

Verifying

.
.
.

Compiler Back End

Copying from ds9 (inet)

Working....Tue Jan 03 21:20:50 GMT 1995

Verifying

Kernel Header and Common Files

Copying from ds9 (inet)

Working....Tue Jan 03 21:22:17 GMT 1995

Verifying

The installation procedure has successfully installed the software subsets

The installation of the DEC OSF/1 software subsets is now complete.

If you installed DEC OSF/1 from a CD-ROM, you can unmount and remove the CD-ROM at this time. To unmount the CD-ROM, you must be superuser or root and you must be one directory above the mount point of

the CD-ROM. Use a command similar to the following:

```
# umount /dev/rz4c
```

If you do not unmount the CD-ROM before trying to remove it, the CD will not eject from the drive when you press the eject button. If you are not one directory above the mount point of the CD-ROM when you execute the `umount` command, you will see the message `device busy`.

After software installation is complete, proceed to Chapter 6 for information about configuring and setting up your system.

This chapter provides information about:

- System configuration
- Entering the system name, superuser password, and date and time
- Building the kernel
- Logging in for the first time
- Registering and loading software licenses
- Accessing online documentation
- Setting up your system for general use (the networking, mail, and print subsystems)
- Enabling realtime preemption

6.1 Configuring the System

System configuration refers to the process of tailoring the operating system software for use. After the software installation is complete, a prompt asks whether or not you want to configure the system:

You can now choose to configure the system for use or you can defer configuration. If you choose to defer configuration, the system will halt. Configuration will happen next time the system is booted.

If you choose to configure now, you will be asked a series of questions. The system will then generate a customized kernel, reboot and be ready to use.

Would you like to configure the system for use at this time? (y/n):

In almost all cases you should answer **y** to this prompt. After configuration is complete you must be prepared to answer system information questions (such as your system name, your superuser password, your time zone, and the current date and time).

Note

You will not be prompted to enter your system name, the time zone, and the current date and time if this is a Remote Installation Services (RIS) installation. A RIS installation means that you installed your operating system software over a local area network (LAN) from a server system, not from a CD-ROM.

If you enter *y*, the system configuration process begins. The name of each software subset is displayed as it is being configured. Your output depends upon the software subsets you chose to install and your processor type. Your display will be similar to the following:

```
** SYSTEM CONFIGURATION ***
```

```
Configuring "Base System " (OSFBASE320)
```

```
Configuring "Base System - Hardware Support " (OSFHWBASE320)
```

```
•  
•  
•
```

```
Configuring "Adobe Fonts " (OSFDPSFONT320)
```

```
Configuring "Additional Networking Services " (OSFINET320)
```

When subset configuration is complete you must enter the system information that is shown in Section 6.2. If you choose to defer configuration until a later time, enter *n* at the prompt. This halts the system and the console prompt (*>>>*) displays.

If you defer configuration, you need to boot the system to restart the system configuration process:

```
>>> b
```

After the system boots, the subsets installed during the installation procedure are configured. The name of each subset is displayed as it is being configured.

6.2 Entering System Information

After the subsets are configured, the system displays a series of prompts that ask you to enter the following system information:

- Your system name
- Your superuser (*root*) password

- The time zone
- The current date and time

This information must be entered in the specified format. If you enter an inappropriate response, the prompt is redisplayed until you enter a valid response.

If you performed a Remote Installation Services (RIS) installation, the system attempts to obtain your system name, the time zone, and the current date and time from the network.

6.2.1 Entering the System Name

If the system name was not obtained from the network (during a RIS installation), you must enter a system name. The system name is used to identify your system on the network. You can use up to 64 alphanumeric characters (a-z and 0-9) in a system name, alphabetic characters can be upper or lower case, and the first character must be a letter. You can also use the following special characters in a system name: a hyphen (-), an underscore (_), and a period (.).

Following are examples of correct and incorrect system names:

Correct: your_name Alpha-1995
Incorrect: @your_name 1995-Alpha

You may want to consult your System Administrator before choosing your system name because your System Administrator may have defined site-specific restrictions (such as maximum length). *Do not* use **generic** or **binary** for your system name.

Your screen display will be similar to the following:

```
*** SYSTEM NAME SPECIFICATION ***

Select the name of your system using alphanumeric characters.
The first character must be a letter.  For example, tinkers.
Enter your system name: aruba

You selected 'aruba' as the name of your system.
Is this correct? (y/n).[y]:
```

6.2.2 Entering the Superuser (Root) Password

When you are prompted to enter your superuser password, enter the superuser password using a combination of upper and lower case letters. Passwords must contain a minimum of 5 to a maximum of 16 characters, but the DEC OSF/1 Operating System only verifies the first 8 characters. Digital suggests using numbers and special characters such as the dollar sign (\$), the percent

sign (%), the number sign (#), the period (.), the hyphen (-), the underscore (_), or the at sign (@) in your password.

The following example shows correct and incorrect superuser password specification:

```
Correct:  What%is-it      dl_Wrote@Home   9Point.99
Incorrect: lowercaseonly  nocharacters   Four
```

Choose a password that is easy for you to remember because you will need to use it to *log in* as `root` for the first time. You can change your superuser password to something more cryptic later (using the `passwd` command). When you enter the password, it is not displayed on your screen for security reasons. You will be prompted to enter your new password again as validation.

Your screen display will be similar to the following:

```
*** SUPERUSER PASSWORD SPECIFICATION **
```

```
Changing password for root.
```

```
New password:
```

```
Retype new password:
```

6.2.3 Entering the Time Zone

If the time zone was not obtained from the network (during a RIS installation), a Time Zone menu lists the time zones that are available. You should select the time zone that best describes your location. If you do not select a time zone, the default is Greenwich Mean Time (GMT). If you choose the United States (US) time zone, a second menu displays the specific time zones in the United States. Table 6-1 describes the acronyms that appear in the Main Time Zone menu:

Table 6-1: Time Zone Menu Definitions

Time Zone Acronym	Description
CET	Central European Time
EET	Eastern European Time
Factory	Specifies No Time Zone
GB-Eire	Great Britain/Ireland
GMT	Greenwich Mean Time
NZ	New Zealand
NZ-CHAT	New Zealand, Chatham Islands
MET	Middle European Time
PRC	Peoples Republic of China

Table 6-1: (continued)

Time Zone Acronym	Description
ROC	Republic of China
ROK	Republic of Korea
SystemV	Specific to System V operating systems
UCT	Greenwich Mean Time
US	United States (displays secondary menu)
UTC	Greenwich Mean Time
Universal	Greenwich Time
W-SU	Middle European Time
WET	Western European Time
Zulu	Coordinated Universal Time

Your screen display will be similar to the following:

***** Main Timezone Menu *****

```
-----  
1) Australia      2) Brazil        3) CET           4) Canada  
5) Chile          6) Cuba         7) EET          8) Egypt  
9) Factory        10) GB-Eire     11) GMT         12) Greenwich  
13) Hongkong     14) Iceland    15) Iran        16) Israel  
17) Jamaica      18) Japan       19) Libya       20) MET  
21) Mexico       22) NZ          23) NZ-CHAT    24) Navajo  
25) PRC          26) Poland     27) ROC        28) ROK  
29) Singapore    30) SystemV    31) Turkey     32) UCT  
33) US           34) UTC        35) Universal  36) W-SU  
37) WET          38) Zulu
```

0) None of the above

Select the number above that best describes your location: 33

***** US Timezone Menu *****

```
-----  
1) Alaska        2) Aleutian     3) Arizona      4) Central  
5) East-Indiana  6) Eastern      7) Hawaii       8) Indiana-Stark  
9) Michigan      10) Mountain   11) Pacific     12) Samoa
```

0) None of the above

Select the number above that best describes your location: 6

You selected US/Eastern as your time zone.

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

6.2.4 Entering the Date and Time

If the date and time was not obtained from the network (during a RIS installation), you will be prompted to enter the current date and time. The system date and time is entered in the format `yymmddhhmm` where `yy` represents the year, `mm` represents the month, `dd` represents the day of the month, `hh` represents the current hour in 24-hour (military) time, and `mm` represents the minutes. For example, January 3, 1995, 4:30PM is entered as follows: `9501031630`.

To enter an accurate time, it is advisable to type the minutes value one minute in the future, and when your wristwatch (or clock) reaches that minute value, press the Return key.

Your screen display will be similar to the following:

```
*** DATE AND TIME SPECIFICATION ***
```

The current date and time should be specified using the following format:

```
yymmddhhmm
```

Use two digits for year (`yy`), month (`mm`), day (`dd`), hour (`hh`), and minute (`mm`). Enter the time in 24-hour format. For example, 11:30 p.m. on July 25, 1993 would be entered as:

```
9307252330
```

Enter the date and time: `9501031630`

The date and time has been set to Tue Jan 03 16:30:09 EST 1995
Is this correct? (y/n) [y]:

If the current date and time was obtained from the network during a RIS installation, you will not be prompted to enter the information, and the following message displays automatically:

The date and time has been set to Tue Jan 03 16:30:09 EDT 1995

Note

The installation procedure includes the date and time in Greenwich Mean Time (GMT) in some displays. The date and time recorded by the installation procedure might be later or earlier than the date and time for your time zone. Although the absolute time displayed in the installation is incorrect, relative time elapsed is accurate. Therefore, you can still use time-stamping to determine how long the installation is taking.

6.3 Building the Kernel

If you performed a basic installation, the kernel is built automatically. Continue with Section 6.4.

If you performed an advanced installation, the kernel options that you see on your display will depend on the subsets that you selected during installation. The installation of certain base operating system products contain a kernel component, and the installation procedure gives you the option to include or exclude the product from the kernel.

If you do not select the kernel option for the product, you will not be able to use that product. For example, if you do not select the Logical Storage Manager (LSM) kernel option, even though you installed the LSM software subsets, you will not be able to use LSM. When you select a kernel option, additional code to support the option is loaded into the kernel. Therefore, selecting All of the above kernel options significantly increases the size of the kernel.

The installation process displays a menu of kernel options similar to the following:

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

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

Selection	Kernel Option
1	Asynchronous Transfer Mode (ATM)
2	System V Devices
3	Logical Volume Manager (LVM)
4	Kernel Breakpoint Debugger (KDEBUG)
5	Packetfilter driver (PACKETFILTER)
6	STREAMS pkt module (PKT)
7	Data Link Bridge (DLPI V2.0 Service Class 1)
8	X/Open Transport Interface (XTISO, TIMOD, TIRDWR)
9	File on File File System (FFM)
10	ISO 9660 Compact Disc File System (CDFS)
11	Audit Subsystem
12	Local Area Transport Support
13	Logical Storage Manager (LSM)
14	All of the above
15	None of the above

```
Enter the selection number for each kernel option you want.  
For example, 1 3 : 14
```

The following is a description of each kernel option:

Asynchronous Transfer Mode (ATM)

The ATM option installs the kernel software and applications necessary to use an ATM network. The ATM optional subsets are installed automatically if the installation process detects ATM hardware on the system. The DEC OSF/1 ATM subsystem supports the ATM Forum

User-Networking (UNI) Version 3.0 specification, including ILMI for registration of a single address, UNI signaling for point-to-point connections, and QOS class 0 with best effort delivery.

System V Devices

The System V Devices option includes kernel options for devices required for the System V environment product. These devices are `/dev/prf` (System V kernel profiler) and `FFM_FS` (File On File File System).

Advanced File System (AdvFS)

The Advanced File System is a log-based, local file system that allows modification and expansion of file systems by mounting on different devices or adding devices to that file system.

If you chose AdvFS as the file system type for `/usr` or `/var` the subset is not optional and will not be displayed in the menu; AdvFS will be configured automatically.

Logical Volume Manager

The Logical Volume Manager provides a virtual disk that enables you to store data without regard to the physical boundaries of individual disks. LVM will be retired and replaced by the Logical Storage Manager (LSM) in a future functional release of DEC OSF/1.

Kernel Breakpoint Debugger (KDEBUG)

The Kernel Breakpoint Debugger loads the kernel debugger `kdebug` and provides physical memory space for debugging custom kernels.

Packetfilter driver

The packetfilter is a software interface that allows an application to send and receive packets directly to or from a local area network (Ethernet or FDDI). The packetfilter provides flexible demultiplexing (filtering) of incoming packets, so that many such applications may run simultaneously.

The DEC OSF/1 packetfilter supports two filtering models: the original CMU/Stanford model, as supported in ULTRIX, and the BSD Packet Filter (BPF), which provides more flexible and efficient filtering. (BPF was developed by the University of California, Lawrence Berkeley Laboratory.) Several public domain applications that use the packetfilter are integrated in DEC OSF/1, including `rarpd`, `tcpdump`, `tcpsplice`, `nfswatch`, and `nfslogsum`. Refer to the `packetfilter(7)` reference page for more information.

STREAMS pkt module (PCKT)

The STREAMS pkt module provides emulation for the SVR4 `pty` packet module.

Data Link Bridge (DLPI V2.0 Service Class 1)

Provides a DLPI V2.0 (Service Class 1) interface to BSD IFNET based network interfaces that allows STREAMS based protocol stacks to utilize BSD IFNET based network interfaces.

This kernel option is mandatory for LAT (Local Area Transport). If you installed LAT, Data Link Bridge does not appear as a kernel option.

X/Open Transport Interface (XTISO)

The X/Open Transport Interface (XTISO) defines an application interface that is independent of any transport provider. Programs written to XTI can be run over a variety of transport providers, such as Transmission Control Protocol (TCP) or User Datagram Protocol (UDP). The application specifies which transport provider to use.

File on File File System (FFM)

File on File (FFM) is a file system that permits mounting a regular, character, or block special file on top of a regular file to support the STREAMS subsystem. This feature is used mainly by SVR4 compatible system calls. It can be viewed as a dynamic version of named pipes. The contents of the covered file are still available to any process that had the file open at the time of the FFM mount. FFM is required for the System V Environment.

ISO 9660 Compact Disc File System (CDFS)

CDFS provides the ability to mount CD-ROMs formatted to the ISO 9660 standard or the High Sierra Group (HSG) format.

Audit Subsystem

The Audit Subsystem provides a security audit system configurable through the `audit_setup` command. The subset provides additional security on system features such as passwords, account ownership, and remote access.

Local Area Transport Support

The LAT protocol provides an efficient means of logically connecting terminal servers to one or more nodes on the same local area network (LAN).

LAT software has the features required for a host to function as a service node so that requests for connections can be made by server users. LAT also permits host applications to initiate connections to the server's ports, designated as applications ports, to access remote devices such as printers. DEC OSF/1 supports 1500 logins using LAT.

If you chose the LAT subset when you made your subset selections, the option is not displayed in the kernel option menu and is configured automatically. If you add the LAT subset after the installation, you must reconfigure the kernel using the `doconfig` command.

Logical Storage Manager (LSM)

The Logical Storage Manager is an integrated, host-based disk storage management tool that protects against data loss and improves disk input/output (I/O) performance. Basic LSM functionality includes disk spanning and concatenation. System Administrators use LSM to perform disk management functions without disrupting users or applications accessing data on those disks.

After entering your choice of kernel options, the system displays a list of options you selected and asks you to verify your choice. For example:

You selected the following kernel options:

```
Asynchronous Transfer Mode (ATM)
System V Devices
Logical Volume Manager (LVM)
Kernel Breakpoint Debugger (KDEBUG)
Packetfilter driver (PACKETFILTER)
STREAMS pckt module (PCKT)
Data Link Bridge (DLPI V2.0 Service Class 1)
X/Open Transport Interface (XTISO, TIMOD, TIRDWR)
File on File File System (FFM)
ISO 9660 Compact Disc File System (CDFS)
Audit Subsystem
Local Area Transport Support
Logical Storage Manager (LSM)
```

Is that correct? (y/n) {y}:

If the displayed kernel options are not the ones you want, enter **n** at the prompt. If the displayed kernel options are the ones you want, enter **y** or press Return to accept the default response.

Next, the system asks if you want to edit the configuration file, for example:

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

The reasons you may want to edit the configuration file are: when you want to add devices, when you want to add tuning parameters, or when you don't want to lose any customizations you may have previously made to the file.

- If you enter **n** or press Return (to enter the default response) to skip the edit of the configuration file, the kernel build process begins:

```
The system will now automatically build a kernel
and then reboot. This will take approximately 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.
```

When the subsets are configured and the configuration file is completed, the `doconfig` utility makes the special device files needed by the hardware and builds the kernel for your system. Messages similar to the

following are displayed:

```
*** PERFORMING KERNEL BUILD ***  
Working....Tue Jan 03 15:45:24 EST 1995  
Working....Tue Jan 03 15:47:24 EST 1995  
Working....Tue Jan 03 15:49:25 EST 1995  
Working....Tue Jan 03 15:51:26 EST 1995
```

Note

If you did not set the `boot_osflags` variable, by default the system is in single-user mode when it reboots. The system reboots using the new kernel when `doconfig` completes. To bring the system to multiuser mode, press `Ctrl/d` at the prompt (`#`). You will be prompted to enter the run level. There are four basic run levels available: `0` specifies the halt state, `S` or `s` specifies single-user mode, `2` specifies multi-user mode without network services, and `3` specifies multi-user mode with network services.

- If you enter `y` to edit the configuration file, the following message displays:

```
Using 'ed' to edit the configuration file. Press return  
when ready, or type 'quit' to skip the editing session:
```

- Enter the word `quit` if you want to skip the editing session and start the kernel build process.
- Press the `Return` key if you want to edit the configuration file. The following example shows an editing session using the `ed` text editor where the value of `maxusers` is changed:

```
Using 'ed' to edit the configuration file. Press return  
when ready, or type 'quit' to skip the editing session:  
Return  
9787  
/maxuser  
maxusers          128  
s/128/512  
maxusers          512  
w  
9787  
q
```

The kernel build begins when you write and quit the editing session.

The *Command and Shell User's Guide* contains a tutorial that teaches you how to use the `ed` text editor. Refer to *System Administration* for information about the contents of the configuration file and the entries that you may want to edit.

Refer to Section 6.11 if you want to enable realtime preemption.

6.4 Logging in to the System

What happens when you log in for the first time depends upon whether you have a workstation or a terminal:

- If you have a workstation, a login window is displayed. Enter `root` as the login name and enter the superuser password you set up earlier when you entered your system information. When you correctly enter your system name and password, a setup message displays. You will only see this message the first time you log in. For subsequent logins, a Session Manager window and a DECterm window will appear. If you have a workstation, proceed to Section 6.5 for an explanation of the setup message.
- If you do not have a workstation, enter `root` at the login prompt (as the user name) and enter the superuser password you specified earlier when you entered your system information. Proceed to Section 6.7.1 for information about registering and loading the licenses for the DEC OSF/1 Operating System.

6.5 The Setup Welcome Message

If you have a workstation, the first time you log in as `root` after a system installation or the first time you log in to a FIS (factory installed software) system, the DEC OSF/1 Operating System displays a setup welcome message.

This message tells you how to prepare your operating system for general use now that you have installed the DEC OSF/1 software and built the kernel. The topics in the welcome message contain information about Product Authorization Keys (PAKs), adding users, and reading online documentation. An example of the setup welcome message and topics follows:

```
Welcome to DEC OSF/1 Version 3.2
=====
```

```
To prepare this system for general use, the Product Authorization
Keys (PAKs) that were purchased with this system must be
installed to allow users to login and/or access licensed software
packages. In addition, several DEC OSF/1 subsystems, such as
networking, mail, printing and others, must be configured.
```

```
This utility, in addition to allowing for the configuration of
DEC OSF/1 subsystems, provides information on other tasks that you
may want to do during or after this utility runs. You can access
this information from the following menu. If you wish to view
```

this information, do so before choosing option 5. This information is also available in the Installation Guide and the FIS Quick Reference Card.

- 1) Read this first!
- 2) Information about loading license PAKs
- 3) Information about accessing online documentation
- 4) Information about adding users
- 5) Begin system configuration
- 6) Exit

Please enter your selection:

If you enter 6 and exit the setup welcome message, you still need to configure your DEC OSF/1 subsystems at a later time by entering `/usr/sbin/setup` or by selecting **System Setup** from the Session Manager's application menu when logged in as root. Section 6.7.1 through Section 6.10 also describe the topics presented in the setup welcome message.

The following examples show the contents of each topic in the welcome message:

1. Read This First:

This system should have included all of the software, hardware options, documentation, and product authorization keys (PAKs) that you ordered. In some cases, documentation sets and/or DEC OSF/1 distribution CD-ROMs may not have been purchased for each system ordered.

The configuration utilities invoked by this utility are designed to simplify the configuration process and have been made as self-explanatory as possible. Before configuring your system, Digital recommends that you refer to the following documents:

- o Installation Guide
- o Network Configuration
- o System Administration

You can view these guides online from the Online Documentation CD-ROM or you can read hard copy versions from the Startup Kit or from the hard copy documentation set you may have purchased.

In addition, read the Release Notes for your version of DEC OSF/1 because the Notes contain important information about the installation and about the operating system in general.

Press RETURN to continue

2. Information about loading license PAKs:

LOADING LICENSE PAKS

Product Authorization Keys (PAKs) are included with your distribution kit and are used to register a license for a product. To register and load the license PAKs for the DEC OSF/1 operating system and other products, you must use the License Management Facility (LMF).

The OSF-BASE PAK must be registered before you can use DEC OSF/1. This PAK provides simultaneous login capacity for two users and allows you to access the online documentation. The user "root" does not count as an Interactive Operating System User.

The OSF-BASE PAK is an availability PAK (see the Software License Management guide for more information about PAK types). The OSF-BASE PAK comes in varying denominations corresponding to your system type. If you have upgraded your system by purchasing new or additional CPU modules, you may need to upgrade your OSF-BASE license. You do this by registering the OSF-BASE PAK provided with your original system purchase along with additional OSF-BASE PAKs provided with your system upgrade purchases.

OSF-USR PAKs provide simultaneous login capacity for additional users beyond those provided by the OSF-BASE PAK. NOTE: If you have an OSF-USR PAK with zero units, which allows an unlimited number of users, remove all other OSF-USR PAKs, including the one automatically registered during the installation, before registering the unlimited OSF-USR PAK.

You may have purchased other PAKs or have other PAKs that were included with your system purchase that should also be registered using LMF.

If you have an existing PAK with an Availability Code of "H", refer to the following chart for the required license units. If you need additional license units, contact your sales representative.

AVAILABILITY "H" LICENSE REQUIREMENTS

Processor Name	Lic Units
AlphaServer 1000	1050
AlphaServer 2000	1100
AlphaServer 2100	1100
AlphaServer 20000	1200
AlphaServer 21000	1200
AlphaStation 200	1050
AlphaStation 400	1050

DEC 2000-300	1050
DEC 2000-500	1050
DEC 3000-300	1050
DEC 3000-400	1050
DEC 3000-500	1100
DEC 3000-600	1050
DEC 3000-700	1050
DEC 3000-800	1100
DEC 3000-900	1100
DEC 4000-610	1150
DEC 4000-620	1200
DEC 4000-710	1150
DEC 4000-720	1200
DEC 7000-610	1200
DEC 7000-620 thru 660	1250
DEC 7000-710 thru 760	1150
DEC 10000-610	1250
DEC 10000-620 thru 660	1300

When you begin the system configuration by choosing option 5 of this utility, PAKS can be registered by selecting License Management Facility (LMF). You may optionally execute LMF to manage PAKS (see lmf(8)) at a later time.

The Installation Guide provides additional information about registering the OSF-BASE and OSF-USR PAKS.

Press RETURN to continue

3. Information about accessing online documentation:

ACCESSING ON-LINE DOCUMENTATION

The DEC OSF/1 documentation is provided on the Online Documentation CD-ROM as files that can be displayed using Bookreader, a DECwindows application. If you have a workstation with a CD-ROM drive and the Online Documentation CD-ROM, you can view the documentation on your system by following these steps:

1. Log in as root or become superuser.
2. Place the DEC OSF/1 CD-ROM in the CD-ROM drive.
3. Mount the DEC OSF/1 CD-ROM on /cdrom by entering the following commands:

```
# mkdir /cdrom
```

```
# mount -r /dev/rz<unit #>c /cdrom
```

(Replace <unit #> with the unit number of your CD-ROM drive.)

In almost all cases, the unit number of the CD-ROM drive on a new system will be 4 (/dev/rz4c). However, to ensure that you have the correct unit number for the drive, enter the following command as root:

```
# file /dev/rrz*c
```

The file command identifies the CD-ROM drive as an RRD disk. The unit number of the drive will be in the left-hand column (rrz4c in the following example):

```
/dev/rrz4c: character special (8/4098) SCSI #0 RRD42 disk #32  
(SCSI ID #4)
```

4. Using the text editor of your choice, append the following SINGLE line to the file /usr/lib/dxbook/library.decw_bookshelf:

```
shelf\cdrom/DOCUMENTATION/BOOKREADER/decosf1\DEC OSF/1 Online Doc
```

5. To invoke Bookreader, do one of the following:

- o Enter the following command:

```
# /usr/bin/X11/dxbook &
```

OR

- o Select the Bookreader option from the Applications menu of the Session Manager.

For information on how to serve Bookreader files across NFS or to review these setup instructions, see the Installation Guide.

For additional information on using Bookreader, see the document Using Bookreader that is accessible on Bookreader itself.

Press RETURN to continue

4. Information about adding users:

ADDING USERS

The way to add users to your system varies depending on how your system is configured.

If your system has Enhanced Security, you should use the XSysAdmin utility to add users. The Security guide has more information.

If your system uses the Network Information Service (NIS), the local or distributed passwd file may need to be modified. To set passwords when NIS is in use, the yppasswd command is used. The Network Configuration guide has more information.

If this system uses neither Enhanced Security nor NIS, you can use the adduser command to create user accounts. The System Administration guide has more information.

Press RETURN to continue

5. Begin system configuration:

Use this menu to set up your system and network. When you select an item, you will be asked a series of questions.

For more information about the items on the menu and the questions you must answer, see the System Administration and Network Configuration guides.

- 1) Internet Networking
 -) Local Area Transport (LAT)
- 2) Berkeley Internet Name Domain Service (BIND)
- 3) Network Information Service (NIS)
- 4) Network File System (NFS)
 -) UNIX-to-UNIX Copy Program (UUCP)
- 5) Network Time Protocol (NTP)
- 6) Mail
 -) POLYCENTER Common SNMP Agent
 -) Printers
- 7) Security (BSD/C2)
- 8) Security Auditing
- 9) License Management Facility (LMF)
- 10) Prestoserve I/O Acceleration
 -) Verifier/Exerciser Tool (VET)
- 11) Update Administration Utility
- 12) Exit

Enter the menu item number that you want:

The setup welcome message displays on your workstation only the first time you log in as root or the first time you log in to a FIS system. If you do not choose to perform the necessary subsystem configuration at this time, you must do so at a later time through the use of the setup utility. This utility is accessed by entering the following command (as superuser):

```
# /usr/sbin/setup
```

If you did not choose to use the setup welcome menu to set up your system, Section 6.7.1 contains more information about the License Management Facility and how to install your PAKs, Section 6.8 describes how to display online documentation, and Section 6.10 contains information about system setup in general. The first thing you should do is to register and load your

license PAKs. Continue with Section 6.7.1 for information about registering your PAKs.

6.6 Files on Your System After the Installation

The installation procedure leaves the `init` file in the `/tmp` directory. This is an unnecessary file that you can delete.

Many files with the prefixes `.new..` and `.proto..` are left on the system. The Update Installation (documented in Chapter 2) requires the `.new..` files to retain customizations during the update installation process. The `.proto..` files are used for customizing Dataless Management Services (DMS) client systems. **Do not remove these files.**

6.6.1 Installation Log Files

A list of the log files created during the installation is displayed on the screen (or in the console log if you have a workstation) after you log in for the first time. The display is similar to the following:

```
DEC OSF/1 X3.2 (Rev. xxx); Tue Jan 03 10:38:04 EDT 1995
DEC OSF/1 X3.2 Worksystem Software (Rev. xxx.x)
```

The installation software has successfully installed your system.

There are logfiles that contain a record of your installation. These are:

```
/var/adm/smlogs/install.log      - general log file
/var/adm/smlogs/install.FS.log   - file system creation logs
/var/adm/smlogs/setld.log        - log for the setld(8) utility
/var/adm/smlogs/fverify.log     - verification log file
```

The previous message is also recorded in `/etc/motd` for your future reference. The `/etc/motd` file contains the *message of the day* that is displayed each time a user logs in. The installation log files are located in the `/var/adm/smlogs` directory and include the choices you made during the installation (such as the partitions you chose, the software subsets you installed, etc.).

6.7 Loading and Registering Software Licenses

Product Authorization Keys (PAKs) are used to register a license for a product. PAKs are registered and loaded after the DEC OSF/1 software subsets are installed during a basic or advanced installation. To register and load the license PAKs for the DEC OSF/1 Operating System and other products, you must use the License Management Facility (LMF). Refer to *Software License Management* or Section 6.7.1 for information about using

LMF to load your PAKs.

The OSF-BASE PAK must be registered before you can use DEC OSF/1. This PAK provides simultaneous login capacity for two users and allows you to access the online documentation. The user `root` does not count as an interactive operating system user.

The OSF-BASE PAK is an availability PAK (refer to the LMF documentation for more information about PAK types). This PAK comes in varying denominations corresponding to your system type. If you have upgraded your system by purchasing new or additional CPU modules, you may need to upgrade your OSF-BASE license. This can be accomplished by registering the OSF-BASE PAK provided with your original system purchase along with additional OSF-BASE PAKs provided with your system upgrade purchases.

OSF-USR PAKs provide simultaneous login capacity for additional users above and beyond those provided by the OSF-BASE PAK.

Note

If you have an OSF-USR PAK having zero units, which allows an unlimited number of users, remove all other OSF-USR PAKs, including the one automatically registered during the installation, before registering the unlimited OSF-USR PAK. The automatic PAK has an authorization number of `OSF-BASE-IMPLICIT-USER`.

You may have purchased other PAKs, or have other PAKs that were included with your system purchase that should also be registered using LMF. Refer to Section 6.7.1 for instructions on registering and loading the OSF-BASE license.

6.7.1 Using the License Management Facility

The first thing you should do on a newly installed system is to register and load your licenses for the DEC OSF/1 Operating System by using the License Management Facility (LMF). Before registering a license for a product, you need a Product Authorization Key (PAK). A PAK contains licensing information for the product and is included with your distribution kit. This information must be registered in the License Database (LDB) and loaded into the kernel cache to use the product.

This section describes how to register and load the Base System license. The Base System PAK provides simultaneous login capacity for two users and among other things allows you to access the online documentation. An example of a license PAK follows:

----- TM
d	i	g	i	t	a	l

LICENSE SOFTWARE PRODUCT
PRODUCT AUTHORIZATION KEY

DOCUMENT ISSUE DATE
1-JAN-1995

Digital Equipment Corporation
Maynard, MA.

LICENSE ADMINISTRATION LOCATION:

Digital Equipment Corporation
Corporate Business Practices
110 Spit Brook Road
Nashua, N.H. 03062

ORDERED BY: USER
USER
USER

PAK ID:

Issuer: DEC
Authorization Number: BCPTMP011371

PRODUCT ID:

Product Name: OSF-BASE
Producer: DEC

NUMBER OF UNITS:

Number of units: 50

KEY LEVEL:

Version: 3.2
Product Release Date: 01-JAN-1995

KEY TERMINATION DATE:

Key Termination Date: 30-JUL-1995

RATING:

Availability Table Code: A
Activity Table Code:

MISCELLANEOUS:

Key Options: ALPHA
Product Token:
Hardware-Id:
Checksum: 2-MDNK-CNGN-IAOI-DOEG

To install a PAK, use the `lmfsetup` (License Management Facility) program. You can access this program as `root` either from the command line or by using the Setup menu. Refer to Section 6.10.1 for information on using the Setup menu. In either case, the `lmfsetup` program prompts you for information and then registers the license data. Use the information provided in the paper PAK that is included with your distribution kit to answer the prompts. Some items in the PAK may not have an associated value; press Return at these prompts.

Note

Use the `lmf reset` command or reboot your system to enable PAKs that were loaded since the last system reboot.

Example 6-1 shows a sample `lmfsetup` session. Complete the following steps to register and load the Base System license:

1. To run the `lmfsetup` program, enter the following command:

```
# /usr/sbin/lmfsetup
```

The program displays the `lmfsetup` menu as shown in Example 6-1. Use the information provided in the paper PAK to answer the prompts.

Example 6-1: Sample `lmfsetup` Session

```
Register PAK (type q or quit to exit) [template]
  Issuer : DEC
  Authorization Number : BCPTMP011371
  Product Name : OSF-BASE
  Producer : DEC
  Number of units : 50
  Version : 3.2
  Product Release Date : 01-JAN-1995
  Key Termination Date : 30-JUL-1995
  Availability Table Code : A
  Activity Table Code :
  Key Options : ALPHA
  Product Token :
  Hardware-Id :
  Checksum : 2-MDNK-CNGN-IAOI-DOEG
PAK registered for template successfully
Register PAK (type q or quit to exit) [template] q
Would you like an lmf reset to be performed at this time? [Yes]
```

2. To load the license into the kernel cache, enter the following command:

```
# /usr/sbin/lmf load 0 OSF-BASE
```

3. To display details of the registered products on your screen, enter the following command:

```
# /usr/sbin/lmf list
```

Information similar to the following is displayed on the screen:

Product	Status	Users: Total	Active
OSF-BASE	active	2	
OSF-USR	active	2	

An `active` status for a product indicates that it is registered and loaded into the kernel cache. An `enabled` status indicates that the product is registered, but not loaded.

If you purchased a DEC OSF/1 Server Extension PAK or the DEC OSF/1 C Developer's Extension PAK, they can be registered at this time as well.

6.8 Activating the Bookreader Application

The DEC OSF/1 documentation is located on the CD-ROM labeled *Disc 2 - DEC OSF/1 Online Documentation V3.2*. The documentation is provided as files that can be displayed using Bookreader, a DECwindows application. You must install the OSF-BASE PAK provided with your kit to use Bookreader.

6.8.1 Accessing Online Documentation from a Workstation

To access the documentation on a workstation, follow these steps:

1. If you do not know the device name for the CD-ROM drive, use the `file` command to find it. Enter the following command as superuser:

```
# file /dev/rxz*c
```

The `file` command returns output similar to that shown in the following example. The entry shown below for the CD-ROM drive includes the words `RRD42 disk` (you may have an `RRD43` CD-ROM drive). On a DEC 3000 Model 500 processor, the CD-ROM is usually `rxz4`. The backslashes in this example indicate line continuations and are not in the actual display.

```
/dev/rxz2c: character special (8/2050) SCSI \  
#0 RZ25 disk #16 (SCSI ID #2)  
/dev/rxz3c: character special (8/3074) SCSI \  
#0 RZ25 disk #24 (SCSI ID #3)  
/dev/rxz4c: character special (8/4098) SCSI \  
#0 RRD42 disk #32 (SCSI ID #4)  
/dev/rxz8c: character special (8/16386) SCSI \  
#1 RZ56 disk #64 (SCSI ID #0)  
/dev/rxz9c: character special (8/17410) SCSI \  
#1 RZ57 disk #72 (SCSI ID #1)
```

2. As superuser, use the `mkdir` command to make a directory to use as the mount point for the CD-ROM. Then use the `mount` command to mount the CD-ROM. As shown in the following example, substitute the unit number of your CD-ROM drive for the `unit_number`.

```
mount -r /dev/rxzunit_numberc /cdrom
```

For example, to mount a directory named `cdrom` on `rz4c`, enter the following commands:

```
# mkdir /cdrom
# mount -r /dev/rz4c /cdrom
```

To ensure that the CD-ROM is remounted in the event that your system crashes or is rebooted, use the text editor of your choice and open the `/etc/fstab` file. Add the following line:

```
/dev/rz4c /cdrom ufs ro 0 0
```

When your edits are correct, write and quit the file.

The system will now mount the CD-ROM on `/cdrom` on every reboot.

3. Edit the `/usr/lib/dxbook/library.decw_bookshelf` file and append the following single line to the file:

```
shelf/cdrom/DOCUMENTATION/BOOKREADER/decosf1\DEC OSF/1 X3.2 Online
Docs
```

Note

In the previous step, you can optionally change the file name `/decosf1` to anything that you want. By doing this, you prevent an extra level of documentation hierarchy in the Bookreader library window. The file `library.decw_bookshelf` in directory `/usr/lib/dxbook` also contains a `TITLE` line that displays the title of `dxbook`. You can change this title from "Sample Library" to something else, for example, *Documentation Library*. Search for the following line:

```
TITLE\sample_lib\Sample Library
```

Replace the line in the previous example with the following line:

```
TITLE\usr/lib/dxbook\Documentation Library
```

4. Start Bookreader by entering the following command:

```
# /usr/bin/X11/dxbook &
```

Bookreader is run in the background by including an ampersand (&) after the command.

Once Bookreader is running, you can use it to read the books on the Documentation CD-ROM. For more information, read the online book *Using Bookreader*.

6.8.2 Accessing Online Documentation from a Server

Because Bookreader does not support character cell terminals in the base product, to view the DEC OSF/1 Bookreader files you must export them to a workstation running either ULTRIX Version 4.2 (or higher) or DEC OSF/1 Version 1.3 (or higher).

The following steps assume that networking is set up on the server system. For further information on setting up the network, refer to `netsetup(8)` and `nfsetup(8)` or *Network Configuration*.

To export the Bookreader files to a workstation, follow these steps:

- On the server system:
 1. Log in as root or become superuser.
 2. Ensure that the DEC OSF/1 Documentation CD-ROM is mounted or that the Bookreader files have been copied to disk. This example assumes that the server system has mounted the DEC OSF/1 Documentation CD-ROM on `/cdrom`. For instructions on how to mount the CD-ROM, see Section 6.8.1.
 3. Using the text editor of your choice, place an entry in the `/etc/exports` file for the `/cdrom` directory and make sure that you specify the `-ro` option for a read-only export, as follows:

```
/cdrom -ro
```
- On the client system:
 1. Log in as root or become superuser.
 2. Run `nfsetup` and import the `/cdrom` directory from the server as a read-only file system.
 3. When `nfsetup` completes, mount the `/cdrom` directory by entering the following command:

```
# mount /cdrom
```
 4. Edit the `/usr/lib/dxbook/library.decw_bookshelf` file and append the following single line to the file:

```
shelf\cdrom\DOCUMENTATION\BOOKREADER\decosf1\DEC OSF/1 X3.2  
Online Docs
```

Note

`/usr/lib/dxbook/library.decw_bookshelf` also contains a `TITLE` line that displays the title of `dxbook`. You can optionally change this title from "Sample Library" to something else, for example,

Documentation Library. Search for the following line:

```
TITLE\sample_lib\Sample Library
```

Replace the line in the previous example with the following line:

```
TITLE\usr/lib/dxbook\Documentation Library
```

5. Start Bookreader by entering the following command:

```
# /usr/bin/X11/dxbook &
```

Bookreader is run in the background by including an ampersand (&) after the command.

Once Bookreader is running, you can use it to read the books on the disc. For more information, read the online book *Using Bookreader*.

6.9 Contents of the DEC OSF/1 Documentation CD-ROM

The DEC OSF/1 documentation CD-ROM is labeled *Disc 2 - DEC OSF/1 Online Documentation V3.2*. This CD-ROM contains the DEC OSF/1 documentation in Bookreader (.DECW_BOOK) format. These files are located in the /DOCUMENTATION/BOOKREADER directory on the CD-ROM. Table 6-2 lists the bookshelves and titles that are available. In addition to documentation files, the CD-ROM contains bookshelf files, which Bookreader uses to organize the library of books into bookshelves. Once Bookreader is running, the book *Using Bookreader* and the bookshelf for the DEC OSF/1 Operating System books appear in the library window. The DEC OSF/1 bookshelves are arranged as follows:

- Startup Documentation
- General User Documentation
- System and Network Administration Documentation
- Programming Documentation
 - Windows Programming Documentation
 - General Programming Documentation
- Writing Device Drivers Documentation
- Migration Documentation
- Security Documentation
- Reference Pages

Table 6-2: Bookreader Bookshelves and Titles

Bookshelf	Book Title
Startup	<i>Installation Guide</i>
	<i>New and Changed Features</i>
	<i>Release Notes</i>
	<i>Technical Overview</i>
General User	<i>Command and Shell User's Guide</i>
	<i>DECwindows User's Guide</i>
	<i>Documentation Overview and Glossary</i>
	<i>Security</i>
	<i>New and Changed Features</i>
	<i>Release Notes</i>
	<i>ULTRIX to DEC OSF/1 Migration Guide</i>
System and Network Administration	<i>DEC Verifier and Exerciser Tool User's Guide</i>
	<i>Security</i>
	<i>Guide to Prestoserve</i>
	<i>Kernel Debugging</i>
	<i>Logical Storage Manager</i>
	<i>Network Administration and Problem Solving</i>
	<i>Network Configuration</i>
	<i>New and Changed Features</i>
	<i>Release Notes</i>
	<i>Sharing Software on a Local Area Network</i>
	<i>Software License Management</i>
	<i>System Administration</i>
	<i>System Tuning and Performance Management</i>
	<i>ULTRIX to DEC OSF/1 Migration Guide</i>
<i>X Window System Environment</i>	

Bookshelf	Book Title
Windows Programming	<i>DECwindows Companion to the OSF/Motif Style Guide</i>
	<i>DECwindows Extensions to Motif</i>
	<i>DECwindows Motif Guide to Application Programming</i>
	<i>Developing Applications for the Display PostScript System</i>
	<i>New and Changed Features</i>
	<i>OSF/Motif Programmer's Guide</i>
	<i>OSF/Motif Style Guide</i>
	<i>Release Notes</i>
	<i>X Window System Environment</i>
	General Programming
<i>DEC OSF/1 Calling Standard for AXP Systems Security</i>	
<i>Digital Portable Mathematics Library</i>	
<i>DECladebug Debugger Manual: Command-Line Interface</i>	
<i>Guide to DECthreads</i>	
<i>Guide to Realtime Programming</i>	
<i>Network Programmer's Guide</i>	
<i>New and Changed Features</i>	
<i>Programmer's Guide</i>	
<i>Programming with ONC RPC</i>	
<i>Programming Support Tools</i>	
<i>Release Notes</i>	
<i>ULTRIX to DEC OSF/1 Migration Guide</i>	
<i>Writing Software for the International Market</i>	
Writing Device Drivers	
	<i>Writing Device Drivers: Reference</i>
	<i>Writing Device Drivers: Advanced Topics</i>
	<i>Writing Device Drivers for the SCSI/CAM Architecture Interfaces</i>
	<i>Writing EISA and ISA Bus Device Drivers</i>

Bookshelf	Book Title
	<i>Writing PCI Bus Device Drivers</i>
	<i>Writing TURBOchannel Device Drivers</i>
	<i>Writing VMEbus Device Drivers</i>
	<i>Release Notes</i>
	<i>New and Changed Features</i>
Migration	<i>ULTRIX to DEC OSF/1 Migration Guide</i>
Reference Pages	<i>Reference Pages Section 1</i>
	<i>Reference Pages Section 2</i>
	<i>Reference Pages Section 3</i>
	<i>Reference Pages Section 4</i>
	<i>Reference Pages Section 5</i>
	<i>Reference Pages Section 7</i>
	<i>Reference Pages Section 8</i>

6.10 Setting Up the System for General Use

This section describes the steps necessary to prepare your operating system for general use. If you have a workstation and you did not perform these steps from the DEC OSF/1 Welcome Screen the first time you logged in as `root` or the first time you logged into your FIS system, you must follow the instructions in this section to perform the required subsystem configurations.

This section explains how to do the following:

- Use setup scripts
 - There are programs (scripts) to help you perform tasks such as setting up the network or setting up mail.
- Add users and groups
- Run the SVID2 Habitat
- Verify the installation
- Set up security features

6.10.1 Using the Setup Programs

There are programs such as `lprsetup`, `netsetup`, and `bindsetup` to help you set up your printer and network. These programs are available from a menu and from the command line.

To use the Setup menu on a workstation, log in as `root` and choose **System Setup** from the **Applications** menu. You can also access the Setup menu from the command line by becoming `root` and entering the `setup` command. For example:

```
# su -
password:
# /usr/sbin/setup
```

In either case, the system displays a menu similar to the following:

You can use this menu to set up your system and network. Select the item you want to set up and answer the questions.

For more information on the items in the menu see the "System Administration" and "Network Configuration" guides.

- 1) Internet Networking
- 2) Local Area Transport (LAT)
- 3) Berkeley Internet Name Domain Service (BIND)
- 4) Network Information Service (NIS)
- 5) Network File System (NFS)
- 6) UNIX-to-UNIX Copy Program (UUCP)
- 7) Network Time Protocol (NTP)
- 8) Mail
- 9) POLYCENTER Common SNMP Agent
- 10) Printers
- 11) Security (BSD/C2)
- 12) Security Auditing
- 13) License Management Facility (LMF)
- 14) Prestoserve I/O Acceleration
- 15) Verifier/Exerciser Tool (VET)
- 16) Update Administration Utility
- 17) Exit

Please enter your selection:

The options on this menu differ depending on the subsets that were chosen during the installation. In the previous example, all mandatory and optional subsets were chosen during the installation. If a subset was not installed, the option appears on the menu, but the number next to it will not be displayed. When a number is not displayed next to an option, you cannot choose that option.

When you choose an option, messages may be displayed that scroll off the top of the screen. Use the scroll bar at the left of the screen to review these messages. Each of the setup programs is a series of interactive prompts during which questions are displayed on the screen and you respond accordingly. Most questions provide you with default responses and in most

cases, you can choose the defaults. Any default parameters that you accept can always be changed at a later time.

You should read the relevant sections of the DEC OSF/1 documentation set before running a setup program or choosing an option from the Setup menu. The documentation will tell you what information you need to answer screen prompts. It will also tell you if there are any prerequisites to running a specific setup program.

The *Network Configuration* guide provides information that you will need to use the networking programs. The *System Administration* guide provides information on system administration tasks such as configuring printers.

6.10.2 Adding a User Account

This section describes how to add a user account by using the `adduser` program. The `adduser` program can be used if you are running the Berkeley Internet Name Domain (BIND) naming service. If you are running the Network Information Service (NIS) naming service, refer to *Network Configuration* for information on how to add a user on a networked system.

Note

If you have enhanced security installed on your system, you should use the `XSysAdmin` windowing interface to add users. Refer to *Security* and `XSysAdmin(8)` for more information.

Use the `adduser` command to add user accounts to the system. You can use the `addgroup` command to modify the `/etc/group` database file.

To use the `adduser` program, enter the following command:

```
# adduser
```

The program responds with a series of prompts and messages, as shown in the following examples. The brackets ([]) indicate a default response. Press Return to accept the default, or enter a different response and press Return.

```
Enter a login name for the new user (for example, john): chris
Enter a UID for (chris) [5006]: 
Enter a full name for (chris): Christopher Ryan
Enter a login group for (chris) [users]: 
Enter another group that (chris) should be a member of.
(<Return> only if none): 
Enter a parent directory for (chris) [/usr/users]: 
The shells are:
/usr/bin/sh      /usr/bin/ksh    /bin/csh       /bin/ksh
/usr/bin/csh    /bin/sh
Enter a login shell for (chris) [/bin/sh]: 
```

Then `adduser` asks if you want to edit the authentication entry for the user. If the environment variable `EDITOR` is set, `adduser` will use `$EDITOR` to

edit the user's authentication entries.

Do you wish to edit the auth file entry for this user (y/[n])?

Next, the `adduser` program displays informational messages and asks you to enter a new password for the user. To ensure confidentiality, the password will not be displayed.

```
Adding new user ...
Rebuilding the password database...
10 password entries, maximum length 145
Creating home directory...
```

```
You must enter a new password for (chris).
Changing password for chris.
```

```
New password:
Retype new password:
```

If you mistype the password when you are asked to verify it, no password is set and the account is disabled. To enable the user account, enter the `passwd` command followed by the user name.

A hashed `passwd` database allows for faster searches of the `passwd` file. If a hashed `passwd` database did not exist previously, the program displays a message informing you that the hashed `passwd` database does not exist and asks if you want a database created. If you want a hashed `passwd` database, enter `yes` at the prompt and the `adduser` program will create one for you. If you do not want a hashed `passwd` database, enter `no` at the prompt. Refer to the `vipw(8)` reference page for information about editing the `/etc/passwd` file.

The `adduser` program automatically creates a `/var/spool/mail` directory for the user. If the user plans to use the Network File System (NFS) to mount the mail file to a workstation, you might want to create the mail file for the user. Refer to *Network Configuration* for information on exporting a mail file to a workstation.

For more information on the `adduser` utility, refer to `adduser(8)`. For information on adding a group, refer to *System Administration* or `addgroup(8)`.

6.10.3 Setting Up Printers

Printers are set up with the `lprsetup` program.

The `lprsetup` program prompts you for the name and type of the printer. After answering these questions, you are prompted with a series of other questions, which you can answer by taking the default.

Note

Printing cannot take place unless the `lpd` daemon is running.

Refer to `lprsetup(8)` or *System Administration* for more information about setting up printers.

6.10.4 Running the SVID2 Habitat

If you have installed the SVID subsets and want to run the SVID2 Habitat, execute the following command (as superuser) after the system is booted.

```
# /usr/sbin/timezone
```

6.10.5 Verifying the Installation

If you installed the Verifier/Exerciser Tool (VET) subset, you can use VET to verify that the hardware and the operating system installed successfully. Refer to the *DEC Verifier and Exerciser Tool User's Guide* for information about VET.

6.10.6 Setting up Security

Refer to *Security* for information on setting up the enhanced security option. You must install the C2 security subsets before you can use this feature.

6.10.7 Setting Up the Logical Storage Manager (LSM)

Refer to *Logical Storage Manager* for information about setting up LSM. You must install the LSM subsets before you can use this feature.

The full installation process installs a new `/usr` and optionally the `/var` file systems into disk partitions. To enable use of LSM volumes for the `/usr` and `/var` file systems, the disk partitions need to be encapsulated into LSM volumes. Refer to the *Logical Storage Manager* for information about how to encapsulate disk partitions to LSM volumes.

If you performed a full installation and were previously running LSM with `/usr` and/or `/var` on an LSM volume, you will have to clean up (remove) these LSM volumes from your configuration since they are no longer in use. Before the current `/usr` and `/var` file systems can be encapsulated to LSM volumes, the LSM configuration that existed before the full installation must be cleaned up.

If for example, `vol-rz3g` was an LSM volume that previously contained the old `/usr` file system on a DEC OSF/1 Version 3.0 system and the system was installed with DEC OSF/1 Version 3.2, `vol-rz3g` can be removed using the following steps:

1. Use the `volprint` command to obtain the current LSM configuration:

```
# volprint -htqA
dg rootdg      784247256.1025.lsm

dm disk01      rz14h      simple  512    1789584 /dev/rrz14h
dm rz3g        rz3g          nopriv  0      819200 /dev/rrz3g

v  vol-rz3g    fsgen         DISABLED CLEAN  819200 SELECT -
pl vol-rz3g-01 vol-rz3g     DISABLED CLEAN  819200 CONCAT - RW
sd rz3g-01    vol-rz3g-01 0          0      819200 rz3g rz3g
```

2. Remove the LSM volume `usrvol`:

```
# voledit -g rootdg -rf rm vol-rz3g
```

3. Remove the disk on which `usrvol` existed:

```
# voldg -g rootdg rmdisk rz3g
```

4. Remove the disk from the LSM configuration:

```
# voldisk rm rz3g
```

Steps similar to those performed for the LSM volume (if it exists) should be performed to the `/var` file system.

Refer to *Logical Storage Manager* for information about how to setup LSM volumes for `/usr` and `/var` after a full installation.

6.11 Enabling Realtime Preemption

DEC OSF/1 provides a kernel option to enhance the performance of realtime applications conforming to POSIX 1003.1b-1993 (formerly 1003.4 Draft 14). These realtime kernel options make it possible for the operating system to guarantee that an application has access to resources in a timely and predictable manner.

The realtime kernel which supports kernel preemption was previously installed as an option during base system installation. Now, the POSIX 1003.1b portions are included in the kernel automatically and a separate kernel is not needed. Preemption capabilities are disabled by default, but can be selected and enabled when the kernel is configured and built.

There are two methods to obtain additional realtime capabilities:

- You can use the `setld` command to enable realtime preemption as shown in the following example:

1. Issue the following command:

```
# setld -c OSFBIN320 RT_ON
```

2. Run `doconfig` without any options to generate a new configuration file. After the `RT_ON` operation, the configuration file will contain the entry `options RT_PREEMPT_OPT` that causes preemption to be on by default (in the appropriate lockmode).

Or, you can:

- Use a text editor of your choice to edit the `/etc/sysconfigtab` file and set the `rt-preempt-opt` parameter equal to 1 as shown in the following example:

```
rt-preempt-opt=1
```

After setting this parameter, you must reboot your system. When the `rt-preempt-opt` parameter is set, the system chooses the correct lockmode to support realtime preemption. On a uniprocessor system, the lockmode is set to 1. On a multiprocessor system, the lockmode is set to 3.

This chapter describes the standalone environment that is accessed from the **SYSTEM MANAGEMENT** option on the Installation menu. This chapter describes how to:

- Invoke the standalone environment
- Access devices in the standalone environment
- Mount file systems in the standalone environment
- Restore file systems in the standalone environment
- Change the size of disk partitions in the standalone environment
- How to access Logical Storage Manager (LSM) volumes in the standalone environment

7.1 What is the Standalone Environment?

The standalone environment is a combination of a virtual disk and file system environment. Part of the environment resides only in physical memory and part is mounted from a disk. This disk can be either the distribution media (CD-ROM) or a disk on a RIS server. The primary purpose of the standalone environment, which is also known as the standalone system (SAS), is to support the initial phases of an installation that includes selecting the distribution and system devices and restoring the root file system image to the target system disk.

The standalone environment also supports system management activities. These activities include:

- Restoring a damaged root file system
- Checking the consistency of the root file system
- Restoring the boot block image
- Performing disk maintenance operations such as changing the disk partition layout prior to performing an advanced installation
- Correcting errors in LSM volumes used for `root (/)` or `/usr` file systems or the primary swap

The standalone environment provides commands that help you recover from serious problems such as root file system corruption and enables you to

perform general file system and disk maintenance tasks when no other environment is available. The standalone environment is a primitive environment and does not perform like a full operating system environment. You should perform system management activities in the standalone environment only if you have extensive UNIX operating system experience and an operating system environment is not available.

7.2 Invoking the Standalone Environment

The type of processor that you have determines the media and the commands used to invoke the standalone environment. To summarize, you must shut down your system, then execute the `boot device` command specific to your hardware type to boot your system from CD-ROM or the network. These media and commands are identified and described in Chapter 4.

After you boot your processor, the system displays brief installation information and a menu similar to the following.

```
*** STANDALONE SYSTEM ENVIRONMENT ***

Select the BASIC option to install the mandatory
software subsets for your system configuration.

Select the ADVANCED option to display optional
software subsets from a menu and/or customize
system disks and partitions.

Select the SYSTEM MANAGEMENT option to customize disk
partitions on the system disk.

Select one of the following options:

    1) BASIC Installation
    2) ADVANCED Installation
    3) SYSTEM MANAGEMENT
```

Enter your choice: 3

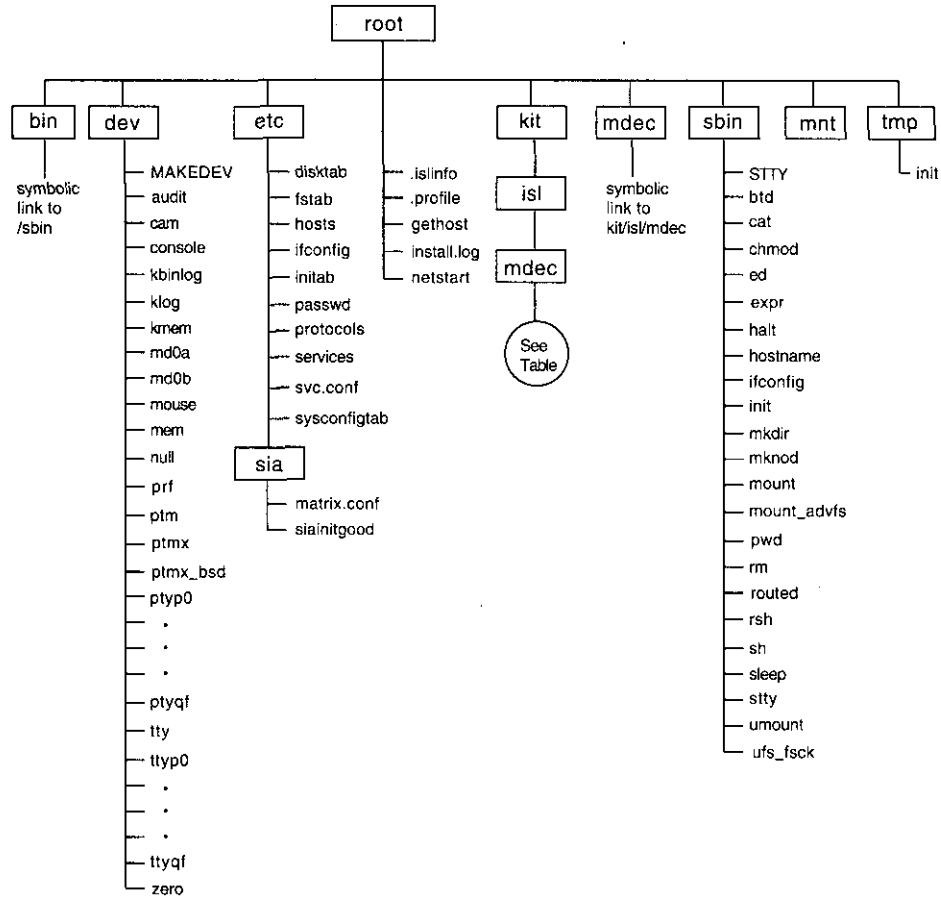
To invoke the standalone environment, choose the SYSTEM MANAGEMENT option from the menu. When you choose the SYSTEM MANAGEMENT option, the system is in single-user mode and the superuser prompt (`#`) is displayed.

7.3 Standalone Environment File System Layout

Figure 7-1 shows the DEC OSF/1 SAS file system, including those commands you need to change disk partition layouts. The boxes in the diagram denote directories. Files shown under the directory boxes may be executable files (commands or scripts), special files, or ordinary files. An example of an executable file is `/kit/is1/disklabel` that is used to display or change disk partition tables.

The PATH shell variable is aware of the layout of the SAS file system that makes it unnecessary to specify the complete pathname when executing a command. For example, /kit/isl/disklabel can be invoked simply by entering disklabel.

Figure 7-1: Partial Layout of the Standalone File System



ZK-0869U-R

Table 7-1 lists the commands and utilities available in the `/kit/isl` directory in the standalone environment.

Table 7-1: Contents of the `/kit/isl` Directory

Error	egrep	mv	ufs_fsck
Lists	finder	newfs	updadmin
Logging	fitset	pickapart	updeng
Pwd	fsck	pwd	updmore
Ready	fverify	radisk	updpblock.dat
Strings	getopt	rcp	updpinfo
Ticker	install.1	restore	updpnowarn.dat
Wait	install.osf	rm	updrepack.dat
awk	installupdate	rsh	updtypechg.dat
cat	kill	scu	vdump
cdl	libmrg	sed	vold
chgrp	libscp	setld	voldctl
compress	log	sifsync	voldg
cp	lpblocker	sizer	voldisk
date	ls	sleep	voliod
dd	machine	sort	volmend
depord	mdec/	stlmenu	volprint
diff	mkfdmn	sync	volrecover
disklabel	mkfset	tar	volume
disktab	mount_advfs	tclear	vrestore
dump	mt	udetect	whoami

7.4 Standalone Environment Capabilities

The standalone environment is a primitive environment that lacks most of the capabilities of a full operating system environment. This environment works without a swap device and with very limited free disk space within the *memory file system*. These two factors mean that tasks requiring large amounts of memory that create the need to swap or tasks requiring large amounts of disk space (such as `/tmp` space) are likely to encounter failures in the standalone environment.

You can use the standalone system to perform the following tasks:

- Edit a file with the `ed` editor
- Create new file systems with the `newfs` command for UNIX File Systems (`ufs`) or with the `mkfdmn` and `mkfset` commands for Advanced File Systems (`AdvFS`)

- Restore file systems with the `restore` command (for `ufs`) or the `vrestore` command (for `AdvFS`)
- Modify partition tables with the `disklabel` command before the advanced installation. Remember to use the `-t advfs` or `-t ufs` option with the `disklabel` command depending upon which file system type is in use (`AdvFS` or `ufs`). `ufs` boot blocks are installed by default if `-t advfs` is not specified. Refer to `disklabel(8)` for more information.
- Mount other disks and file systems with the `mount` command
- Fix `ufs` file systems with the `fsck` command. The `fsck` command is not required for `AdvFS` file systems.

The commands in the `/kit` directory are exported read-only and reside in a read-only file system.

Note

The `root` file system in this environment is located on a virtual disk that is mounted with read-write permissions. However, any changes that you make on files that you create in `root` are volatile and will not be saved when you exit the SAS.

7.5 Accessing Devices in the Standalone Environment

Device special files must be present in the `/dev` directory to access your system's disk and tape devices. Execute `ls /dev` to see if the required device special files exist. If these files do not exist, use the `MAKEDEV` command to create them.

For example, to create the device special file for a SCSI disk, unit number 0 (zero), execute the following commands:

1. Change to the `/dev` directory by entering:


```
# cd /dev
```
2. Use the `MAKEDEV` command to create the disk device special file for `rz0` by entering:


```
# ./MAKEDEV rz0
```

7.6 Mounting File Systems

The standalone environment can be used to perform maintenance operations on existing file systems. For instance, if the kernel (`vmunix`) on your `root` file system becomes damaged and you have a good backup, you can

mount your `root` file system and replace the damaged kernel. If you are using LSM volumes for the `root` file system, refer to Section 7.9 for information about how to start LSM in the standalone environment.

To mount an existing `root` file system located on `/dev/rz0a` in this environment, execute the following commands:

1. Create the device special files for the disk containing the root file system:

```
cd /dev  
./MAKEDEV rz0
```

2. Prepare to mount the file system.

- a. For UNIX file systems (ufs) enter:

```
mount /dev/rz0a /mnt
```

- b. For Advanced File Systems (AdvFS) enter:

```
mkdir -p /etc/fdmns/root_domain  
cd /etc/fdmns/root_domain  
ln -s /dev/rz0a  
mount root_domain#root /mnt
```

The existing root file system is accessible at `/mnt` and can be modified at this point.

7.7 Restoring File Systems

The standalone environment is ideal for restoring damaged root file systems. To restore your root file system, first create the device special files for the disk on which the root file system is to reside. Next create the device special files for the tape device that contains the dump of the root file system to be restored. Create these device special files using the `MAKEDEV` command as shown in Section 7.5.

7.7.1 Restoring UNIX File Systems (ufs)

Follow the procedure shown below to restore a UNIX file system in the standalone environment:

1. If the disk does not have a label, which could occur if the disk was physically damaged or replaced, write the default disk partition tables and bootstrap programs. The disk partitions and bootstrap programs should be operational. To determine if the disk has a valid label, use the `disklabel` command with the following syntax:

```
disklabel -r disk
```

Use the `disklabel` command with the following syntax to write the default disk partition table:

```
disklabel -rw disk disk_type
```

The `disk` parameter specifies the disk that includes the device mnemonic and unit number. The `disk_type` parameter specifies the type of disk associated with `disk` as described in the `/etc/disktab` file.

For example, to write the default disk partition tables on an RZ57 disk, unit 0, enter the following command:

```
# disklabel -rw rz0 rz57
```

Note

The `disklabel` command used in this procedure writes the default disk partition tables to the disk. Writing a label with customized partition table settings may affect the entire disk. If the disk you are restoring has customized partition table settings, invoke the editing option of the `disklabel` command. Refer to *System Administration* or to `disklabel(8)` for more information.

2. Create a new root file system by using the following command syntax:

```
newfs raw_device
```

The `raw_device` parameter specifies the full raw device pathname of the disk device on your system. For example, to create a new file system on an RZ57, unit 0, enter the following command:

```
# newfs /dev/rz0a rz57
```

3. Mount the file system by using the following command syntax:

```
mount block_device /mnt
```

In the previous example, the `/mnt` directory must be created if it does not already exist (directories are created using the `mkdir` command). The `block_device` parameter specifies the full block device path name of the disk device. For example, to mount the file system created in the previous step, enter the following command:

```
# mount /dev/rz0a /mnt
```

4. Next, restore the file system. If you are restoring dump files from a local file system, change to the `/mnt` directory, insert the medium containing the dump file, and enter the `restore` command with the following command syntax:

restore -Yrf *dumpfile*

The *dumpfile* parameter specifies the path name of the file containing the dump data. For a tape, enter the following commands:

```
# cd /mnt
# restore -Yrf /dev/rmt0h
```

You can use the standalone environment to restore other file systems. However, the environment's limitations (refer to Section 7.4 for more information) may cause failures during the restore. Digital recommends performing file system restores from a full operating system environment. If such an environment is unavailable due to the need to restore */var* and/or */usr*, you should boot your system to single user mode using your existing or restored root file system. In the single user mode, more disk space is available, and swap space can be made available by issuing the following command:

```
# swapon -a
```

7.7.2 Restoring Advanced File Systems (AdvFS)

Follow the procedure shown below to restore AdvFS file systems in the standalone environment:

1. If the disk does not have a label, which could occur if the disk was physically damaged or replaced, write the default disk partition tables and bootstrap programs. The disk partitions and bootstrap programs should be operational. To determine if the disk has a valid label, use the *disklabel* command with the following syntax:

```
disklabel -r disk
```

Use the *disklabel* command with the following syntax to write the default disk partition table:

```
disklabel -rw -t advfs disk disk_type
```

The *-t advfs* option must be used when creating an AdvFS root fileset to ensure that the correct boot blocks are placed on the disk. The *disk* parameter specifies the disk that includes the device mnemonic and unit number. The *disk_type* parameter specifies the type of disk associated with *disk* as described in the */etc/disktab* file. For example, to write the default disk partition tables on an RZ57 disk, unit

0, enter the following command:

```
# disklabel -rw -t advfs rz0 rz57
```

Note

The `disklabel` command used in this procedure writes the default disk partition tables to the disk. Writing a label with customized partition table settings may affect the entire disk. If the disk you are restoring has customized partition table settings, invoke the editing option of the `disklabel` command. Refer to *System Administration* or to `disklabel(8)` for more information.

2. Create a new root file domain by using the following command syntax:

```
mkfdmn -t disk_type raw_device domain
```

The `raw_device` parameter specifies the full raw device path name of the disk device on your system. For example, to create a new file system on an RZ57, unit 0, enter the following command:

```
# mkfdmn -t rz57 /dev/rz0a root_domain
```

3. Create a root fileset in the `root_domain` file using the following command:

```
# mkfset domain fileset
```

The `domain` parameter specifies the name of the root file domain. For example, to create the root fileset in the `root_domain` file domain, enter the following command:

```
# mkfset root_domain root
```

4. Mount the `root_domain` fileset by using the following command syntax:

```
mount domain#fileset mount_point
```

The `domain#fileset` parameter specifies the root file domain and the root fileset. The mount point must be created if it does not already exist. For example, to mount the fileset created in the previous steps, enter the following command:

```
# mount root_domain#root /mnt
```

5. Restore the fileset using the `vrestore` command. To restore files from a local file system, change to the `/mnt` directory, insert the medium containing the dump file, and enter the `vrestore` command using the following syntax:

```
vrestore -vxf dumpfile
```

The *dumpfile* parameter specifies the path name of the file containing the dump data. Enter the following commands for a tape:

```
# cd /mnt
# vrestore -vxf /dev/rmt0h
```

Note

You can restore a ufs format dump tape onto AdvFS (for instance if you are converting a ufs root file system to AdvFS) and you can make a vdump tape on ufs. The restore command you use depends on the format of the tape (dump versus vdump) You use vrestore to restore AdvFS dumps performed with the vdump command and restore to restore dumps performed with the dump command. The corresponding restore command is used regardless of the target file system type.

You can use the standalone environment to restore other file systems. However, the environment's limitations (refer to Section 7.4 for more information) may cause failures during the restore. Digital recommends performing file system restores from a full operating system environment. If such an environment is unavailable due to the need to restore /var and/or /usr, you should boot your system to single user mode using your existing or restored root file system. In the single user mode, more disk space is available, and swap space can be made available by issuing the following command:

```
# swapon -a
```

6. Verify the /etc/fstab and /etc/fdmns directories. The mkfdmn command added /etc/fdmns/root_domain to the root file system in the standalone environment that is deleted when you exit the standalone environment.

7.8 Changing the Size of the Disk Partition

You use the *disklabel* command to change the drive identification or the disk partitions on the drive or to replace a damaged label or bootstrap. Remember to use the *-t advfs* or *-t ufs* option with the *disklabel* command depending upon which file system type is in use (AdvFS or ufs). ufs boot blocks are installed by default if *-t advfs* is not specified. Refer to *disklabel(8)* for more information.

Note

You must be experienced with using the `ed` editor when using the `disklabel` command in the standalone environment.

To look at the existing disk partition layout, enter the `disklabel` command in the following format and replace the variable `n` with the unit number of the disk. For example, to look at the existing disk partition layout of an RZ disk, enter the following command:

```
disklabel -r /dev/rzn
```

In the previous example, `n` is the unit number of the disk. The system displays the existing disk partition layout.

To change the size of the disk partition, complete the following steps. The following example uses an `rz26` disk, unit number 0. In this example, the size of the `b` partition is decreased and the size of the `g` partition is increased to include the space no longer being used by the `b` partition.

1. Change to the `/dev` directory:

```
# cd /dev
```

2. Use the `MAKEDEV` command to create the disk device special files for `rz0`:

```
# ./MAKEDEV rz0
```

3. Check the disk label information on `rz0`:

```
# disklabel -r rz0
```

If there is no label, the following message is displayed:

```
Bad pack magic number (label is damaged, or pack is unlabeled)
```

To label the disk with the default partitions, enter the following command:

```
# disklabel -rw rz0 rz26
```

Note

The kernel device drivers do not allow the size of a disk partition to be decreased or the offset of a partition to be changed while it is open. Some device drivers create a label containing only a single large partition if a disk is unlabeled; thus the label must be written to the `a` or `c` partition of the disk while it is open. This sometimes requires the desired label to be set in two steps, the first one creating at least one other partition, and the second setting the label on the new partition while shrinking the `a` partition.

4. Set the EDITOR environment variable to use the ed editor:

```
# EDITOR=ed
export EDITOR
```

5. Edit the disk label for rz0:

```
# disklabel -e rz0
```

6. Display the disk label by entering the following command:

```
1,$p
```

7. Search for the b partition by entering the following command:

```
/b:
```

Information similar to the following is displayed:

```
b: 262144 131072 unused 1024 8192 # (Cyl. 164*- 492*)
```

8. Change the size of the b partition from 262144 sectors to 131072 sectors by entering the following command:

```
s/262144/131072/p
```

This reduces the size of the b partition from 128 MB to 64 MB. The revised information is displayed:

```
b: 131072 131072 unused 1024 8192 # (Cyl. 164*- 402)
```

There is no need to modify cylinder information; cylinder information is automatically modified when you save and exit the file.

9. Search for the g partition by entering the following command:

```
/g:
```

Information similar to the following is displayed:

```
g: 819200 393216 unused 1024 8192 # (Cyl. 492*- 1519*)
```

10. Because the size of the b partition was reduced by 131072 sectors, the size of the g partition should be increased by 131072 sectors. Change the size of the g partition from 819200 sectors to 950272 sectors by entering the following command:

```
s/819200/950272/p
```

This increases the size of the g partition from 400 MB to 464 MB.

11. Change the offset of the `g` partition by entering the following command:

```
s/393216/262144/p
```

The revised information is displayed:

```
g: 950272 262144 unused 1024 8192 # (Cyl. 402*- 1519*)
```

12. To verify your changes, redisplay the disk label by entering the following command:

```
1,$p
```

13. Save your edits and quit the editor by entering the following command:

```
wq
```

The system prompts if you want to write the new label. If you are satisfied with your changes, press Return to accept the default answer, `y`.

```
write new label? [y] 
```

14. Display the newly customized disk by entering the following command:

```
# disklabel -r rz0
```

15. Restart the installation by typing `restart`.

The system displays the following installation menu. Choose the Advanced Installation option by entering the number 2 at the prompt. If you choose the Basic Installation option, the changes you made to the disk label will be lost because the default partitions are always used on the disk selected as the system disk.

```
*** STANDALONE SYSTEM ENVIRONMENT ***
```

```
Select the BASIC option to install the mandatory software subsets for your system configuration.
```

```
Select the ADVANCED option to display optional software subsets from a menu and/or customize system disks and partitions.
```

```
Select the SYSTEM MANAGEMENT option to customize disk partitions on the system disk.
```

```
Select one of the following options:
```

- 1) BASIC Installation
- 2) ADVANCED Installation
- 3) SYSTEM MANAGEMENT

```
Enter your choice: 2
```

7.9 Starting the Logical Storage Manager

If the LSM daemons `vold` and `voliiod` fail to restart when your system is rebooted or the LSM configuration database is corrupted, the LSM volume on which the `root` file system exists will not be accessible. Under such

circumstances your system cannot be brought up to multi-user mode. To repair possible problems in `/etc/vol/volboot` or the `rootdg` diskgroup, you can boot the SAS kernel and use the LSM commands in the SAS area to rectify the problem.

Use commands similar to the following to restart LSM in the standalone environment:

1. Create device special files for at least one disk that has a valid LSM configuration database:

```
# cd /dev
# ./MAKEDEV rz9 rz10
# cd /
```

2. Create LSM device special files:

```
# mknod /dev/volconfig c 41 0
# mknod /dev/volevent c 41 1
# mknod /dev/voliiod c 41 2
# mknod /dev/volinio c 41 3
```

3. Start the LSM error daemons, `voliiod`:

```
# voliiod set 2
# mkdir /etc/vol
```

4. Start the LSM configuration daemon in `disable` mode:

```
# vold -m disable
```

5. Initialize the `/etc/vol/volboot` file:

```
# voldctl init
```

6. Add one of the disks containing the LSM configuration database to the `/etc/vol/volboot` file:

```
# voldctl add disk rz9
```

7. Put `vold` in the `enabled` mode and import all LSM diskgroups:

```
# voldctl enable
```

8. Get a list of all disks known to LSM:

```
# voldisk list
```

Make sure that all disks have a device special files in `/dev`.

9. Execute the `volprint` command to obtain information about the LSM

configuration:

```
# volprint -htA
```

10. Start the LSM volumes:

```
# volume -g diskgroup -U usetype start volume name
```

Refer to the *Logical Storage Manager* guide for more information about how to correct problems encountered while enabling LSM or starting LSM volumes.

7.10 Using a Disk That Contains ULTRIX Partition Information

Any disk that was in use under ULTRIX will have a partition table. In such cases, the `disklabel` command displays the ULTRIX partition information and gives you the following options:

- To create a disk label based on the contents of the ULTRIX partition table
- To create a disk label based on the default DEC OSF/1 partition information found in `/etc/disktab`

The following is an example of the ULTRIX partition table display:

```
ULTRIX compatible partition data found.  
This data may be different than the standard  
partition layout information in /etc/disktab.
```

```
ULTRIX partition table layout is:
```

partition	bottom	top	size	overlap
a	0	32767	32768	c
b	32768	163839	131072	c
c	0	2050859	2050860	a,b,d,e,f,g,h
d	163840	792845	629006	c,g
e	792846	1421851	629006	c,g,h
f	1421852	2050859	629008	c,h
g	163840	983039	819200	c,d,e
h	983040	2050859	1067820	c,e,f

```
Use the ULTRIX-style partition data? [y]: n
```

If you want to preserve the ULTRIX partition data, enter `y` at the prompt; otherwise, enter `n`. If you changed the partition data, the installation procedure recognizes the changes to the disk label and prompts if you want to use the customized partition layout or the default layout. To preserve your changes, choose the customized partition layout.

7.11 Exiting the Standalone Environment

After performing preinstallation, system maintenance, or troubleshooting activities, you can return to the Installation menu and select the advanced or basic installation options by entering `restart` at the superuser prompt (`#`).

To exit from the standalone environment and log in to your already installed system, enter `halt` at the superuser prompt (`#`). When the console prompt (`>>>`) displays, enter `boot device`.

This chapter describes how to use the `setld` command to install additional software subsets after the system installation procedure completes. You can use the `setld` command to perform the following software management tasks:

- Display an inventory of subsets or files within a subset
- Install or remove software subsets

You can find a detailed technical explanation of the `setld` command functions in the *Programming Support Tools* guide.

8.1 Using the `setld` Command

The syntax of the `setld` command is as follows:

```
setld [-D root-path] -c subset-id message
```

```
setld [-D root-path] -d subset-id [ subset-id... ]
```

```
setld [-D root-path] -i [ subset-id [ subset-id... ] ]
```

```
setld [-D root-path] -l location [ subset-id [ subset-id... ] ]
```

```
setld [-D root-path] -v subset-id [ subset-id... ]
```

Table 8-1 provides a brief description of the options for the `setld` command:

Table 8-1: Options for the `setld` Command

Option	Description
-D	In conjunction with any other option, specifies an alternative root directory. For example: <pre># setld -D /usr/doctools -i</pre>

Table 8-1: (continued)

Option	Description
	The directory specified must be the root directory of an entire system hierarchy. Do not attempt to use this option to place software in a directory that is not a system root.
-l	Loads the software kits that are in the specified location; if subsets are specified, only the named subsets are installed. For example: <pre># setld -l /mnt/ALPHA/BASE DNABASE100</pre>
-c	Runs the configuration phase of the named subset's subset control program. Refer to the document supplied by your software vendor for the command syntax. For example: <pre># setld -c DNABASE100 INSTALL</pre>
-i	Displays a list of subsets and their installation status. If a subset is named, displays a list of that subset's contents. For example: <pre># setld -i OSFMANOS320</pre>
-v	Runs the named subset's Installation Verification Procedure (IVP). For example: <pre># setld -v OSFMANOS320</pre>
-d	Deletes the named subset or subsets. For example: <pre># setld -d OSFMANOS320 OSFMANOP320</pre>

To list all the options available for the `setld` command, use the `-h` option:

```
# setld -h
```

8.2 Displaying Subset Inventories

You can use the `setld` command to display an inventory of the subsets recognized by your system, showing the status (installed or not installed) of each subset.

To display a subset inventory, use the `setld -i` command with the following syntax:

```
/usr/sbin/setld [ -D root_path ] -i [ subset-id subset-id... ]
```

The following command shows the status of the software subsets:

```
# /usr/sbin/setld -i
Subset      Status      Description
-----
OSFACCT320 incomplete System Accounting Utilities (System Administration)
OSFAFM320   installed   Adobe Font Metric Files (Printing Environment)
OSFBASE320 installed   Base System (- Required -)
OSFBIN320   installed   Standard Kernel Objects (Kernel Build Environment)
:
:
```

If you use the `-i` option to specify a subset, the `setld` command displays a list of the files in the specified subset. This is useful if you want to determine which subset you need to reload or delete if a particular file is damaged or deleted.

The following command displays the files in the `OSFCLINET320` subset:

```
# /usr/sbin/setld -i OSFCLINET320
./etc/.new..acucap
./etc/.new..hosts
:
:
./usr/sbin/bindsetup
./usr/sbin/fddi_config
```

Use the `-D` option to specify a root directory other than the system root.

8.3 Installing a Software Subset

This section describes how to install software subsets from a specified location. To install a software subset, log in as root and use the `setld -l` command with the following syntax:

```
/usr/sbin/setld [ -D root_path ] -l location [ subset-id [ subset-id... ] ]
```

The *location* variable specifies the location of the software subset that you want to install. You can specify the following *location* variables:

hostname:

Specifies the name of the remote host.

directory

Specifies the disk distribution directory.

The *subset-id* variable specifies the name of the subset. If you do not specify a *subset-id* variable, a list of subsets is displayed, allowing you to choose the ones to install. If you specify one or more *subset-id* variables, only those subsets are installed.

To install subsets from CD-ROM, use the following procedure. The distribution path given in the following examples is for the DEC OSF/1 base

operating system CD-ROM. For other distribution kits, refer to the document supplied by your software vendor.

1. Place your CD-ROM optical disc in its caddy and insert the CD-ROM into the disc drive.
2. To determine what drive the CD-ROM device is located on, enter the following command as superuser:

```
# file /dev/rrz*c
```

Information from the `file` command is displayed. For example:

```
/dev/rrz1c: character special (8/1026) SCSI #0 RZ25 disk #8 (SCSI ID #1)
/dev/rrz2c: character special (8/2050) SCSI #0 RZ25 disk #16 (SCSI ID #2)
/dev/rrz3c: character special (8/3074) SCSI #0 RZ26 disk #24 (SCSI ID #3)
/dev/rrz4c: character special (8/4098) SCSI #0 RRD42 disk #32 (SCSI ID #4)
```

In this output from the `file` command, RRD indicates the CD-ROM device.

3. To mount the distribution media, enter the following command. The following example shows the CD-ROM device is located on the `c` partition of the `rz4` disk:

```
# mount -r /dev/rz4c /mnt
```

4. To install a DEC OSF/1 base subset, enter:

```
# setld -l /mnt/ALPHA/BASE
```

5. The `setld` command displays a numbered list of subset titles and prompts you to enter the number of the subsets you want to install. As shown in the following example, only the subsets not yet installed on your system are displayed in the list.

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.

- CDE Advanced Developers Kit:

- 1) CDE Development Environment
- 2) CDE Manual Pages
- 3) CDE PostScript Documents
- 4) CDE Run-time Environment

- Reference Pages:

- 5) Ref Pages: Admin/User
- 6) Ref Pages: Programming
- 7) Ref Pages: Realtime
- 8) Ref Pages: Windows Admin/User
- 9) Ref Pages: Windows Programming

- Software Development:
 - 10) Additional Motif Demo Sources
 - 11) CDA(tm) for X/Motif Development
 - 12) DEC C (cc -migrate)
 - 13) GNU Revision Control System
 - 14) Realtime Software Development
- Other:
 - 15) DEC Ada runtime library

Or you may choose one of the following options:

- 16) ALL of the above
- 17) CANCEL selections and redisplay menus
- 18) EXIT without installing any subsets

Enter your choices or press RETURN to redisplay menus.

Choices (for example, 1 2 4-6): 5-9

6. Enter the number or numbers associated with the subsets that you want to install. There may be more subsets presented in the menu than can be displayed on a single screen. You can either select subsets in each screen, or select them all together on the last screen. If you select subsets as each screen is displayed, all your choices are presented for you to confirm on the final screen. You can also change your choices or redisplay the subset options.
7. After you enter your choices, the following confirmation message is displayed:

You are installing the following optional subsets:

- Reference Pages:
 - Ref Pages: Admin/User
 - Ref Pages: Programming
 - Ref Pages: Realtime
 - Ref Pages: Windows Admin/User
 - Ref Pages: Windows Programming

Is this correct? (y/n):

8. After you confirm your choice, messages similar to the following display as the subsets are loaded and configured:

```
Checking file system space required to install selected subsets:
Working....Tue Jan 03 11:08:02 EDT 1995
```

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

```
Ref Pages: Windows Programming
Copying from /mnt/ALPHA/BASE (disk)
Working....Tue Jan 03 11:08:36 EDT 1995
Verifying
```

```
Ref Pages: Windows Admin/User
Copying from /mnt/ALPHA/BASE (disk)
Verifying

Ref Pages: Programming
Copying from /mnt/ALPHA/BASE (disk)
Working....Tue Jan 03 11:10:06 EDT 1995
Verifying

Ref Pages: Admin/User
Copying from /mnt/ALPHA/BASE (disk)
Working....Tue Jan 03 11:11:06 EDT 1995
Verifying

Ref Pages: Realtime
Copying from /mnt/ALPHA/BASE (disk)
Verifying
```

```
Configuring "Ref Pages: Windows Programming " (OSFMANWOP320)
```

```
Configuring "Ref Pages: Windows Admin/User " (OSFMANWOS320)
```

```
Configuring "Ref Pages: Programming " (OSFMANOP320)
```

```
Configuring "Ref Pages: Admin/User " (OSFMANOS320)
```

```
Configuring "Ref Pages: Realtime " (OSFMANRT320)
```

9. After the subsets are installed, unmount the CD-ROM.

```
# umount /mnt
```

Note

If there are upgrades to the subsets you installed previously, you may need to install these upgrade subsets. To perform an upgrade, enter the following command:

```
# setld -l /mnt/ALPHA/UPDATE
```

To install Digital software subsets on Remote Installation Services (RIS) clients, refer to *Sharing Software on a Local Area Network*.

8.4 Rebuilding the Kernel After Installing Kernel Build Environment Subsets

Certain DEC OSF/1 base operating system products (such as the Logical Storage Manager, Logical Volume Manager, Advanced File System, and Local Area Transport) contain a kernel component. If you use `setld` to install one of these subsets after the installation, you must run the `doconfig` utility to rebuild the kernel with the new kernel component;

otherwise the option to use the product will not be available. After building a new kernel, reboot with the new kernel to make the product available for use.

Refer to Table B-3 in Appendix B for a list of the software subsets that contain kernel components for which you must run `doconfig` to build a new kernel. Refer to `doconfig(8)` for more information about the `doconfig` utility.

The DEC OSF/1 software is distributed on two read-only compact discs (CD-ROM). The first CD-ROM is labeled *Disc 1 - DEC OSF/1 Operating System V3.2* and contains the operating system software subsets. The software subsets contained on this CD-ROM are documented in Appendix B and Appendix C.

The second CD-ROM is labeled *Disc 2 - DEC OSF/1 Online Documentation V3.2* and contains the DEC OSF/1 documentation set in Bookreader format. Section 6.8 describes how to activate the Bookreader application and lists the books that are available for viewing.

This appendix describes how to perform the following tasks:

- Load a CD-ROM into a caddy
- Insert and remove a CD-ROM
- Mount and unmount a CD-ROM

Before you insert a CD-ROM into its drive, make sure you know how to operate the disc drive. The *Optical Disc Drive Owner's Manual* contains instructions for using the disc drive.

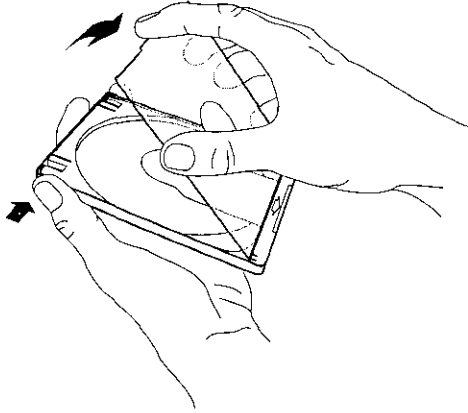
A.1 Loading a Disc into a Caddy

A DEC OSF/1 disc must be placed into a caddy before it can be inserted into an RRD42 disc drive. Follow these steps to load a CD-ROM into a caddy:

1. If a protective cellophane wrapper is on the caddy, remove the wrapper before using the caddy.
2. Press the tabs on both sides of the caddy and lift the lid.
3. Remove the CD-ROM from its packaging. Hold the CD-ROM by its edge.
4. Place the CD-ROM in the caddy, making sure that the labeled side faces up.
5. Close the lid of the caddy by pressing both corners down firmly.

Figure A-1 shows how to press the tabs of the caddy and lift the lid:

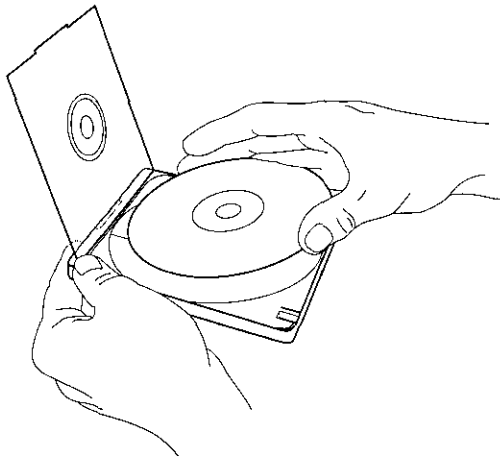
Figure A-1: Pressing Tabs and Lifting Lid of a CD-ROM Caddy



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Figure A-2 shows how to place the disc in the caddy:

Figure A-2: Placing a Disc in a CD-ROM Caddy



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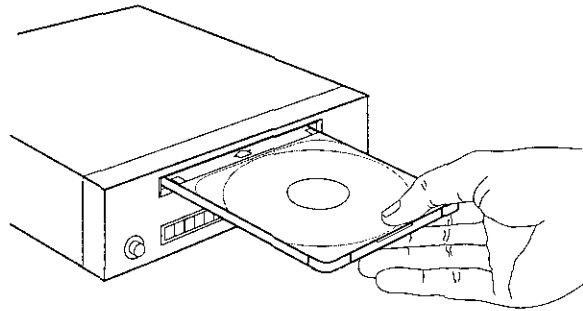
A.2 Inserting and Removing a Disc

After placing the CD-ROM in a caddy, follow these steps to insert the disc caddy into a disc drive:

1. Insert the caddy into the slot in the disc drive. The disc label should be facing up.
2. Push the caddy in until it stops.

Figure A-3 shows a disc (in its caddy) being inserted into a disc drive:

Figure A-3: Inserting a CD-ROM into a Disc Drive



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A.3 Mounting a CD-ROM

Before you can access the information on a CD-ROM, it must be mounted on the system. Follow these steps to mount a CD-ROM:

1. Log in as root or become superuser.
2. If you do not know the device name for the CD-ROM drive, use the following command to find it:

```
# file /dev/rz*c
```

The `file` command returns output similar to that shown in the following example. The entry for the CD-ROM drive includes the words `RRD42 disk`. On a DEC 3000 Model 500 processor, the logical unit number for

the CD-ROM drive is usually rz4.

```
/dev/rxz2c: character special (8/2050) SCSI #0 RZ25 disk #16 (SCSI ID #2)
/dev/rxz3c: character special (8/3074) SCSI #0 RZ25 disk #24 (SCSI ID #3)
/dev/rxz4c: character special (8/4098) SCSI #0 RRD42 disk #32 (SCSI ID #4)
/dev/rxz8c: character special (8/16386) SCSI #1 RZ56 disk #64 (SCSI ID #0)
/dev/rxz9c: character special (8/17410) SCSI #1 RZ57 disk #72 (SCSI ID #1)
```

3. Make a directory that will be the mount point for the CD-ROM, using the `mkdir` command. Then mount the CD-ROM using the `mount` command with the following syntax, substituting the unit number of your CD-ROM drive for the *unit_number*.

```
mount -r /dev/rzunit_numberc /mount-point
```

For example, to mount the CD-ROM in drive `/dev/rz4c` on the directory `/cdrom`, enter the following commands:

```
# mkdir /cdrom
# mount -r /dev/rz4c /cdrom
```

4. To ensure that the CD-ROM is remounted in the event that your system crashes or is rebooted, use the text editor of your choice and open the `/etc/fstab` file. Add a line similar to the following:

```
/dev/rz4c      /cdrom  ufs  ro  0  0
```

When you have ensured that your edits are correct, write and quit the file. The system will now mount the CD-ROM on `/cdrom` on every reboot.

A.4 Unmounting a CD-ROM

Before you can eject a CD-ROM from the disc drive, you must first unmount it using the `umount` command. To unmount the CD-ROM, you must be superuser or `root` and you must be one directory above the mount point of the CD-ROM. Use a command similar to the following:

```
# umount /dev/rz4c
```

If you do not unmount the CD-ROM before trying to remove it, the CD will not eject from the drive when you press the EJECT button. If you are not one directory above the mount point of the CD-ROM when you execute the `umount` command, you will see the message `device busy`.

To remove the disc from the disc drive, press the EJECT button on the drive.

If the EJECT button is disabled by software or if the drive does not eject the caddy after you press the EJECT button, refer to the *Optical Disc Drive Owner's Manual* for instructions.

This appendix describes the DEC OSF/1 software subsets. The software subsets are divided into separate categories: mandatory and optional.

During the installation process, the mandatory subsets are installed automatically during the basic and the advanced installations. Optional subsets are not offered during the basic installation, but you can install them after the installation is complete by using the `setld` command. If you perform an advanced installation, you can install the optional subsets during the installation process or at a later time. See Chapter 8 for information about using the `setld` utility to install subsets after the installation.

B.1 Mandatory Subsets

The mandatory subsets are installed automatically for both the basic and advanced installations.

The Base System and the Base System-Hardware Support subsets cannot be deleted once they are installed.

The Standard Kernel Objects, the Kernel Header and Common Files, the Hardware Kernel Objects, and the Compiler Back End subsets contain object files needed to build the standard kernel. You can delete these subsets by using the `setld -d` command to reclaim disk space after the kernel is built. However, you will not be able to rebuild your kernel. If you need to rebuild your kernel for any reason, you must reinstall the subsets with the `setld -l` command.

Table B-1 describes the mandatory subsets.

Table B-1: Description of the Mandatory Subsets

Title and Contents	Subset Name	Dependencies
<p>Adobe Fonts</p> <p>This subset contains the Type1 fonts and the Adobe font metrics files supplied by Adobe Systems Incorporated to be used by the DPS extension of the server. It also contains the .upr file, which defines these fonts and their location for the DPS extension of the server.</p>	OSFDPSFONT320	
<p>Base System</p> <p>This subset includes fundamental utilities and data files for the DEC OSF/1 operating system. The Base System includes the editors and many of the general-purpose programs.</p>	OSFBASE320	Required for all subsets. This subset cannot be deleted.
<p>Base System—Hardware Support</p> <p>This subset provides the hardware-dependent portion of the BASE subset.</p>	OSFHWBASE320	Required for all subsets. This subset cannot be deleted.
<p>Basic Networking Services</p> <p>This subset contains the software required to provide services over the network using the TCP/IP protocols. These services include remote login (rlogin) and Network Time Protocol (xntp).</p>	OSFCLINET320	Required for Local Area Transport (LAT), NFS Utilities, and Additional Networking Services
<p>Basic X Environment</p> <p>This subset provides programs required for X11/DECwindows and includes the Bookreader application.</p>	OSFX11320	

Table B-1: (continued)

Title and Contents	Subset Name	Dependencies
Compiler Back End C Language Compiler. This subset provides the minimum level of C language support required to build operating system kernels. This subset must be used in conjunction with the Software Development Environment subset for C language software development.	OSFCMPLRS320	Required for Kernel Header and Common Files, Software Development Environment, and selected language layered products
DECwindows 100dpi Fonts This subset provides workstation font files for systems using either the VR160 15-inch monitor or higher resolution graphics (1280 x 1024).	OSFFONT15320	
Hardware Kernel Objects This subset provides hardware-dependent kernel object, header, and data files.	OSFHWBIN320	Requires Kernel Header and Common Files
Kernel Header and Common Files This subset provides the common kernel object header and data files that together with the Standard Kernel Objects and Hardware Kernel Objects subsets allow you to configure and build the kernel. This subset is mandatory during the initial system installation, but can be removed if you do not intend to build kernels on your system.	OSFBINCOM320	Requires Compiler Back End Required for Standard Kernel Objects, Hardware Kernel Objects, and Local Area Transport (LAT)
NFS(tm) Utilities This subset provides the software required to mount remote file systems using the Network File System (NFS).	OSFNFS320	Requires Basic Networking Services

Table B-1: (continued)

Title and Contents	Subset Name	Dependencies
Standard Kernel Objects This subset contains hardware-independent kernel object, header, and data files.	OSFBIN320	Required to build DEC OSF/1 kernels Requires Kernel Header and Common Files
X Fonts This subset provides X11 fonts from the X Consortium compiled for the DEC X server.	OSFMITFONT320	
X Servers This subset provides X11/DECwindows server support. A DECwindows server is the software that provides windowing on a workstation.	OSFSER320	

B.2 Optional Subsets

The optional subsets contain software that supports a variety of applications. If you choose the basic installation procedure, these subsets are not available during the installation, but can be installed after the installation completes by using the `setld` command. If you choose the advanced installation, you can select these subsets at installation time.

The optional subsets can be deleted after they are installed. Be aware that some optional subsets are dependent upon other subsets. For example, the Doc. Preparation Tools Extensions subset requires the Doc. Preparation Tools subset; therefore, if you delete the Doc. Preparation Tools subset, the Doc. Preparation Tools Extensions subset will not work.

The following is a list of the optional subset categories. Locate the category you are interested in and refer to the corresponding table for subset descriptions.

- General Applications – Table B-2
- Kernel Build Environment– Table B-3
- Mail Applications – Table B-4

- Network-Server/Communications – Table B-5
- Printing Environment – Table B-6
- Reference Pages – Table B-7
- Software Development – Table B-8
- Supplemental Documentation – Table B-9
- System Administration – Table B-10
- Text Processing – Table B-11
- Windowing Environment – Table B-12
- Windows Applications – Table B-13

B.2.1 General Applications Subsets

Table B-2 describes the subsets in this category.

Table B-2: Description of the General Applications Subsets

Title and Contents	Subset Name	Dependencies
<p>Common Agent</p> <p>This subset contains the Digital Common Agent Utilities. This subset should be installed if you have the EDO layered products (Common Agent Toolkit) installed or if you want to run the Simple Network Management Protocol (SNMP) Agents. The SNMP Agent allows management of the Internet, FDDI, system resources, and network resources using SNMP. This subset contains the SNMP protocol engine and its related managed object modules.</p>	OSFCOMAGENT320	

Table B-2: (continued)

Title and Contents	Subset Name	Dependencies
<p>Computer Aided System Tutorial</p> <p>This subset provides a simple, interactive online tutorial about subjects such as basic file handling, the <code>vi</code> text editor, the capabilities of the <code>ls</code> command, <code>ms</code> macros, editors in general, <code>eqn</code> (a language for typesetting mathematics), and the C Programming Language. The <code>learn(1)</code> reference page provides information about invoking the tutorial.</p>	OSFLEARN320	
<p>GNU Emacs</p> <p>The GNU Emacs editor is an advanced, self-documenting, extensible, real-time display text editor that can be customized.</p>	OSFEMACS320	
<p>Local Area Transport (LAT)</p> <p>Local Area Transport (LAT) is a protocol that provides a means of logically connecting terminal servers to one or more nodes on the same local area network (LAN).</p> <p>LAT software has the features required for a host to function as a service node, so requests for connections can be made by server users.</p>	OSFLAT320	Requires Kernel Header and Common Files and Basic Networking Services
<p>Logical Storage Manager</p> <p>This subset contains the LSM administrative commands and tools to manage an LSM configuration.</p>	OSFLSMBASE320	Requires LSM Kernel Build Objects (OSFLSMBIN320)
<p>Logical Storage Manager Graphical User Interface</p> <p>This subset contains the LSM Motif-based graphical user interface (GUI) management tool and related utilities.</p>	OSFLSMX11320	Requires Base System, OSFLSMBASE320, OSFLSMBIN320, OSFX11320

Table B-2: (continued)

Title and Contents	Subset Name	Dependencies
Logical Volume Manager The Logical Volume Manager (LVM) is a subset that is composed of physical devices and logical (virtual) entities to offer you a mechanism for transparently and dynamically storing and retrieving files and file systems across multiple devices and in multiple copies.	OSFLVM320	
UNIX SVID2 Compatibility This subset brings the DEC OSF/1 system into compliance with the Base System and Kernel Extensions of the System V Interface Definition Issue 2 (SVID2). It also adds a higher degree of compatibility with the Basic Utilities Extensions of SVID2.	OSFSVID2320	
UNIX to UNIX Copy Facility This subset provides programs and data files needed for a system to participate in a network of machines using the UUCP facility. This facility transmits files over serial communications lines.	OSFUUCP320	

B.2.2 Kernel Build Environment Subsets

Table B-3 describes the subsets in this category.

Table B-3: Description of the Kernel Build Environment Subsets

Title and Contents	Subset Name	Dependencies
<p>POLYCTR AdvFS Kernel Objects</p> <p>This subset contains program and data files for the POLYCENTER Advanced File System (AdvFS). This subset supports uniprocessor, SMP, and realtime configurations.</p>	OSFADVFSBIN320	
<p>Hardware Kernel Header and Common Files</p> <p>This subset contains the binary common files that are hardware specific. This subset is required to build kernels and is mandatory during the installation (the kernel build process). If you do not plan to build kernels on your system, this subset can be removed. This subset supports uniprocessor, symmetric multiprocessing (SMP), and realtime configurations.</p>	OSFHWINCOM320	Requires Kernel Header and Common Files
<p>Logical Storage Manager Kernel Header and Common Files</p> <p>This subset contains the LSM kernel include files to build LSM with the kernel. This subset supports uniprocessor, SMP, and realtime configurations.</p>	OSFLSMBINCOM320	Requires Compiler Back End
<p>Logical Storage Manager Kernel Build Objects</p> <p>This subset provides the kernel objects to build the kernel with LSM drivers. This subset supports uniprocessor, SMP, and realtime configurations.</p>	OSFLSMBIN320	Requires Kernel Header and Common Files and OSFLSMBINCOM320

B.2.3 Mail Applications Subsets

Table B-4 describes the subsets in this category.

Table B-4: Description of the Mail Applications Subsets

Title and Contents	Subset Name	Dependencies
DECwindows Mail Interface This subset provides the DECwindows mail application for <code>dxmail</code> .	OSFXMAIL320	Requires RAND Corp. Mail Handler (MH) and OSFDECW300, Additional DECwindows Applications
RAND Corp. Mail Handler (MH) This subset provides programs that constitute the RAND Corporation MH mail reader interface.	OSFMH320	Required for DECwindows Mail Interface

B.2.4 Network-Server/Communications Subsets

Table B-5 describes the subsets in this category.

Table B-5: Description of the Network-Server/Communications Subsets

Title and Contents	Subset Name	Dependencies
ATM Commands This subset contains the software that provides the Asynchronous Transfer (ATM) mode commands. This subset is mandatory if ATM hardware is detected during the installation process.	OSFATMBASE320	
ATM Kernel Objects This subset contains the ATM kernel objects. This subset is mandatory if ATM hardware is detected during the installation process.	OSFATMBIN320	Kernel Header and Common Files

Table B-5: (continued)

Title and Contents	Subset Name	Dependencies
<p>Additional Networking Services</p> <p>This subset contains the software that provides the networking services; Berkeley Internet Name Domain (BIND) and Network Information Services (NIS).</p>	OSFINET320	<p>Requires Basic Networking Services</p> <p>Required for Remote Installation Services (RIS) and Dataless Management Services (DMS)</p>
<p>Dataless Management Service</p> <p>This subset provides the software needed to run Dataless Management Services. The OSF-SVR PAK is required.</p>	OSFDMS320	<p>The server requires Hardware Kernel Objects, LSM Kernel Objects, Standard Kernel Objects, AdvFS Kernel Objects, and Additional Networking Services.</p>
<p>Remote Installation Services</p> <p>This subset provides services that allow installations of the operating system and applications over a network. The Product Authorization Key (PAK), OSF-SVR is required.</p>	OSFRIS320	<p>Requires Additional Networking Services</p>

B.2.5 Printing Environment Subsets

Table B-6 describes the subsets in this category.

Table B-6: Description of the Printing Environment Subsets

Title and Contents	Subset Name	Dependencies
Adobe Font Metric Files This subset contains font metrics (character bounding box, width, name, ligature, kerning, and font properties) for PostScript outline fonts used by text formatting applications on PostScript output devices. This subset is needed to view files.	OSFAFM320	
Local Printer Support This subset provides printer commands such as <code>lpr</code> , <code>lpq</code> , and <code>lpd</code> ; utilities; configuration files; filters; and PostScript printer support.	OSFPRINT320	

B.2.6 Reference Pages Subsets

Table B-7 describes the subsets in this category.

Table B-7: Description of the Reference Pages Subsets

Title and Contents	Subset Name	Dependencies
Ref Pages: Admin/User This subset provides the online reference pages for system administrators and general users.	OSFMANOS320	Requires Doc. Preparation Tools
Ref Pages: Programming This subset provides the online reference pages for programmers.	OSFMANOP320	Requires Doc. Preparation Tools

Table B-7: (continued)

Title and Contents	Subset Name	Dependencies
Ref Pages: Realtime This subset provides the online reference pages for the Realtime kernel.	OSFMANRT320	Requires Doc. Preparation Tools
Ref Pages: Windows Admin/User This subset provides the online reference pages for windows administrators and users.	OSFMANWOS320	Requires Doc. Preparation Tools
Ref Pages: Windows Programming This subset provides the online reference pages for windows programmers.	OSFMANWOP320	Requires Doc. Preparation Tools

B.2.7 Software Development Subsets

Table B-8 describes the subsets in this category.

Table B-8: Description of the Software Development Subsets

Title and Contents	Subset Name	Dependencies
CDA Software Development The CDA Software Development environment provides C header files that enable programmer access to the CDA Base Services run-time libraries.	OSFCDAPGMR320	Requires Software Development Environment
DEC C Compiler This subset contains the DEC C compiler executable.	OSFDECC320	
LSM Software Development This subset contains the LSM include files.	OSFLSMPGMR320	

Table B-8: (continued)

Title and Contents	Subset Name	Dependencies
<p>CDA for X/Motif Development</p> <p>This subset provides a developer's environment for X11/DECwindows CDA architecture.</p>	OSFXCDADEV320	Requires X Window Software Development
<p>GNU Revision Control System</p> <p>This subset contains programs that make up the UNIX Revision Control System (RCS), which provides a regulation mechanism for large software projects.</p>	OSFRCS320	
<p>Realtime Software Development</p> <p>This subset provides libraries and utilities useful for real-time software development.</p>	OSFRTDEV320	
<p>Software Development Environment</p> <p>This subset provides libraries and utilities useful for software development. These include the libraries for linking programs to be analyzed with the dbx debugger, the lint program verifier, and the lex and yacc parser packages.</p>	OSFPGMR320	Required for CDA Software Development
<p>Source Code Control System</p> <p>This subset contains programs that make up the UNIX Source Code Control System (SCCS), which provides a regulation mechanism for large software projects.</p>	OSFSCCS320	
<p>X Window Software Development</p> <p>This subset provides the library and data files needed to produce X/Motif Window System client applications. This subset also includes example programs demonstrating how to get started.</p>	OSFXDEV320	Required for CDA for X/Motif Development

Table B-8: (continued)

Title and Contents	Subset Name	Dependencies
Additional Motif Demo Sources This subset provides demonstration programs for many Motif features and programming techniques. It contains sources from OSF/Motif V1.2 and sources that demonstrate the use of the extended Motif widget set supplied by Digital.	OSFMOTDEM320	Requires OSFBASE320 Base System

B.2.8 Supplemental Documentation Subset

Table B-9 describes the subset in this category.

Table B-9: Description of the Supplemental Documentation Subset

Title and Contents	Subset Name	Dependencies
XIE Version 5 Online Documentation This subset provides compressed PostScript files of documents for the X Window System Image Extension (XIE) Version 5.0 software.	OSFXIEDOC320	

B.2.9 System Administration Subsets

Table B-10 describes the subsets in this category.

Table B-10: Description of the System Administration Subsets

Title and Contents	Subset Name	Dependencies
C2-Security This subset provides additional configurable system security features such as identification, authentication and audit.	OSFC2SEC320	

Table B-10: (continued)

Title and Contents	Subset Name	Dependencies
Kernel Debugging Tools This subset provides tools for analyzing and debugging kernels.	OSFKTOOLS320	
Obsolete Commands and Utilities This subset contains the commands and utilities that are no longer supported for DEC OSF/1 Version 3.2.	OSFOBSOLETE320	
POLYCTR advfs System Administration commands required for creating and managing the Advanced File System.	OSFADVFS320	
Retired Locales This subset contains obsolete locale databases and should be installed only if you are running applications that require internationalization support and were built on DEC OSF/1 V1.2 or DEC OSF/1 V1.3 systems.	OSFCTABLOC320	
Single-Byte European Locales This subset provides basic internationalization and localization information for 21 Western European locales.	OSFEURLOC320	
System Accounting Utilities This subset provides programs and data files needed to perform system accounting. This subset contains log files that grow automatically.	OSFACCT320	
System Exercisers This subset provides programs that help in diagnosing problems with hardware and peripheral devices.	OSFEXER320	

Table B-10: (continued)

Title and Contents	Subset Name	Dependencies
Verifier/Exerciser GUI This subset provides the graphical user interface for the Verifier/Exerciser Tool subset. This subset includes the DEC VET Motif interface.	OSFXVET320	Requires OSFVET320, Verifier/Exerciser
Verifier/Exerciser Tool This subset provides exercisers and utilities to enhance the serviceability of the DEC OSF/1 operating system and includes the Verifier and Exerciser Tool (VET). The exerciser is used to prove or disprove that hardware on a system is performing as anticipated. If sporadic disk or memory errors appear in the uerf system logs, VET exercises the failing hardware to provide more complete information to a field service representative.	OSFVET320	
C2-Security GUI This subset provides the graphical user interface for the C2 Security subset.	OSFXC2SEC320	Requires OSFC2SEC320, C2-Security

B.2.10 Text-Processing Subsets

Table B-11 describes the subsets in this category.

Table B-11: Description of the Text Processing Subsets

Title and Contents	Subset Name	Dependencies
Doc. Preparation Tools This subset provides tools to format, manage, and display reference pages, including the nroff formatter and required macros.	OSFDCMT320	Required for all reference page subsets

Table B-11: (continued)

Title and Contents	Subset Name	Dependencies
Doc. Preparation Tools Extensions <i>This subset contains additional nroff macro packages, bibliography tools, and roff tools.</i>	OSFDCMTEXT320	Requires Doc. Preparation Tools

B.2.11 Windowing Environment Subsets

Table B-12 describes the subsets in this category.

Table B-12: Description of the Windowing Environment Subset

Title and Contents	Subset Name	Dependencies
DECwindows 75dpi Fonts <i>This subset provides fonts for X11/DECwindows and is needed for specific layered products and low resolution (1024 x 768) monitors.</i>	OSFFONT320	
X Customizations for OEM <i>This subset contains X Window customizations and special logo information for use by specific OEM's when they install DEC OSF/1 . This subset is not available for general use.</i>	OSFXOEM320	

B.2.12 Windows Applications Subsets

Table B-13 describes the subsets in this category.

Table B-13: Description of the Windows Applications Subsets

Title and Contents	Subset Name	Dependencies
<p>Additional DECwindows Applications</p> <p>This subset provides additional X11/DECwindows client applications such as dxcalc (a calculator), dxcalendar, dxcardfiler, dxclock, dxdiff (a visual differences program), dxnotepad, dxpaint (a bitmap editor), dxpresto (graphical display of Prestoserve state and statistics), and dxprint (capture and print screen images).</p>	OSFDECW320	
<p>Additional X Applications</p> <p>This subset contains the additional X Consortium X11 R5 client applications such as: appres, bitmap, bmtoa, atobm, bdfpcf, dxpaint, editres, ico, iconv, listres, lndir, maze, mkdirhier, oclock, puzzle, resize, showfont, showrgb, viewres, x11perf, x11perfcomp, x11perfcomp, xauth, xbiff, dxcalc, xcalc, xclipboard, dxclock, xclock, xcmsdb, xcmstest, xcutsel, xdpr, xdpiinfo, xedit, xev, xeyes, xfd, xfontsel, xgc, xkill, xload, xlogo, xlsatoms, xlsclients, xlsfonts, xmag, xman, xmh, xmkmf, xon, dxpresto, dxprint, xpr, xprop, xrefresh, xstdcmap, xwd, xwininfo, and xwud. Refer to the reference page for each of these applications for more information.</p>	OSFXMIT320	

This appendix describes the subsets that are shipped in addition to the base operating system subsets. These additional subsets are included on the DEC OSF/1 CD-ROM labeled *Disc 1 - DEC OSF/1 Operating System V3.2*. Check the DEC OSF/1 *Release Notes* for any additional subset information. Subset sizes are listed in the *Release Notes*.

Table C-1 lists the additional subsets that can be installed from the CD-ROM from the /ALPHA directory:

Table C-1: Additional Software Subsets

Product Directory	Description	Subset Name
ATOM	ATOM Program Analysis Tools	ATMBASE320
CDE	CDE Development Environment	CDEDEV100
	CDE Reference Pages	CDEMAN100
	CDE Postscript Documents	CDEDOC100
	CDE Run-Time Environment	CDEART100
COMPILERS	Development Enhancements for DEC OSF/1 Alpha Systems - Software Development	CMPDEVENH320
DECLADEBUG	DECladebug debugger	LDBBASE3016
	DECladebug debugger remote server	LDBSRV3016
DEC_Ada_RTL	DEC Ada Run-Time Support Library for DEC OSF/1 Alpha Systems	ADALIB321
DEC_C++_RTL	DEC C++ RTL (shared libraries)	CXXSHRDA305
DEC_Cobol_RTL	DEC COBOL Run-Time Support Library for DEC OSF/1 Alpha Systems	DCARTL210

Table C-1: (continued)

Product Directory	Description	Subset Name
	DEC Decimal Run-Time Support Library	O2ABASE210
DEC_Fortran_RTL	DEC Fortran for DEC OSF/1 Alpha Run-Time Support	DFARTL356
DEC_Pascal_RTL	DEC Pascal for DEC OSF/1 Alpha Run-Time Support	DPORTL522
DEC_Sort_RTL	Sort Run Time Library	SORLIB201
GNUSRC	GNU awk Source GNU Emacs Source GNU Revision Control System Source	FSFGAWKSRC320 FSFEMACSSRC320 FSFRCSSRC320
Networker_SingleServer	NetWorker SingleServer Save and Restore for DEC OSF/1 Alpha Systems NetWorker SingleServer Reference Pages	BRXNSSALPHA301 BRXNSSMAN301
XR6	X11R6 X Server and Font Server X11R6 Development Libraries X11R6 Documentation and Reference Pages	XR6SERVER320 XR6PROG320 XR6DOC320

Worldwide (international) subsets are located in ALPHA/WORLDWIDE/BASE on the CD-ROM labeled *Disc 1 - DEC OSF/1 Operating System V3.2*. Also included on the disc are postscript versions of the *Installation Guide for DEC OSF/1 Worldwide Support Software* and *Release Notes for DEC OSF/1 Worldwide Support Software*. These documents are located in /DOCUMENTATION/POSTSCRIPT/L10N_install_gd.ps and /DOCUMENTATION/POSTSCRIPT/L10N_rel_notes.ps. Text versions of these documents are located in /DOCUMENTATION/TEXT/L10N_install_gd.txt and /DOCUMENTATION/TEXT/L10N_rel_notes.txt.

Section C.16 lists the worldwide subsets that are available.

Note

The `apropos` and `what is` commands access reference page entries in the `what is` database. The `what is` database that is created in `/usr/share/man` when you initially install reference page subsets for the DEC OSF/1 product includes entries only for operating system reference pages.

The `what is` database provided as part of the operating system product is not automatically updated when layered product, third party, or site-specific reference pages are installed after the initial operating system installation. If the `what is` database exists on your system, you should update the database by executing the `catman -w` command. For information about using the `catman -w` command to rebuild the `what is` database, see the `catman(8)` reference page.

C.1 Atom Performance Analysis Tool (ATMBASE)

Atom is a performance analysis and debugging tool kit. This kit is being provided as an ADK (Advanced Developer's Kit). As such, the tools may be used to help diagnose application problems, but it is not a fully supported product at this time. It will be provided as a fully supported product in a future release.

Atom is an object modification tool. Users can develop customized debugging and performance analysis tools. The Atom kit supplies a set of tools which can be used to analyze programs and as references for developing new tools. The tools consist of two components: the instrumentation code and the analysis code. The instrumentation code controls the points at which the application is to be monitored. The analysis code controls what is monitored at those points. The reference pages, stored under `/usr/lib/atom/man`, describe the supplied tools and how to use Atom.

The software and documentation are installed in the directory `/usr/lib/atom`. The Atom utility is stored under `/usr/lib/cmplrs/cc/atom`. The file `/usr/lib/atom/README` contains information about the contents of `/usr/lib/atom`. There are two manpages included: `atom(1)` and `atomtools(5)`. The kit also includes postscript versions of Atom manuals.

The OSFCMPLRS320 subset should be installed before installing Atom. Follow these steps to install Atom:

1. Deinstall any previous version of the kit that may have been installed:

```
setld -d ATMBASE300
```

2. Install Atom:

```
setld -l location ATMBASE320
```

3. Enter 1 or 2 at the prompt which asks which subset you want to install. Atom consists of only one subset, so the answers (1 or 2) are equivalent.

When the installation completes, the verification script may optionally be run:

```
setld -v ATMBASE320
```

The verification process runs a set of confidence tests and stores the results under `/usr/lib/atom/confidence`.

C.2 Common Desktop Environment (CDE)

The Common Desktop Environment (CDE) was developed to provide common desktop services across all UNIX platforms, including a consistent user interface for end users and a consistent development environment for application developers across multiple platforms.

CDE is a graphical user interface that is based on the X Window System (X11) Release 5 and Motif Release 1.2.3.

The CDE Advanced Developer's Kit (ADK) is provided to give users early access to CDE functionality. However, be aware of the following limitations:

- No localization support in the CDE ADK
- No support for dataless environments
- The CDE ADK in this kit is not C2 secure

The CDE ADK is delivered with four subsets that in total require 46 MB of free disk space for installation. The CDE subsets include:

- CDE Development Environment - header files and static lib (600 KB)
- CDE Reference Pages (2.2 MB)
- CDE PostScript Documents (10.2 MB)
- CDE Run-time Environment - executables, shared lib, config (32 MB)

If you have installed CDE from previous work-in-progress (WIP) kits from Digital, remove the `/usr/dt`, `/etc/dt`, and `/var/dt` files and any `autostart` changes that you made before you install this new CDE ADK kit.

The following table lists the mandatory subsets for CDE:

CDE Subset Name	Mandatory Subsets
CDEDEV100	CDEART100, OSFXDEV320
CDEMAN100	CDEART100, OSFDCMT320
CDEDOC100	
CDEART100	OSFBASE320, OSFNFS320, CXXSHRDA305, OSFXMIT320

CDE specific release notes are part of the CDEDOC100 subset and are located in the `/usr/dt/CDE-ReleaseNotes` file.

Use the `setld` command to install the CDE subsets and any other mandatory subsets required for CDE that are not already installed. If you are installing the CDE subsets from the DEC OSF/1 CD-ROM, mount the CD-ROM, and as superuser or `root` enter the following command:

```
# setld -l /mnt/ALPHA/CDE subset_name
```

In the previous example, replace `subset_name` with the CDE subsets you want to install.

If you are performing a RIS installation of the CDE software subsets, enter the following command to begin the RIS installation:

```
# setld -l hostname:
```

Replace `hostname:` with the name of your RIS server appended with a colon (:). The `setld` command displays a numbered list of subsets available to install. Choose CDE from the menu.

During the installation and configuration of the CDEART100 subset, you will be prompted to configure the system to start up CDE automatically during the boot process thereby replacing `DECwindow/xdm`. The prompts displayed on your screen will be similar to the following:

```
Do you want the system to run CDE (instead of DECwindow/xdm)
by default? (y/n) [y]:
```

After the installation, please use the following command to stop `xdm`

```
/sbin/init.d/xdm stop
```

Use the following command to start `cde`

```
/sbin/init.d/cde start
```

This procedure is reversed when CDEART100 is deinstalled.

Note

TCP/IP, NFS, and NIS must be installed and configured to start dtlogin to use CDE.

You can manually turn off CDE by performing the following steps:

1. Use the mv command to move the CDE and XDM files:

```
# mv /sbin/rc3.d/S96cde /sbin/rc3.d/.S96cde
# mv /sbin/rc3.d/.S95xdm /sbin/rc3.d/S95xdm
```

2. Edit the /etc/inittab file and comment out the following single line. (The backslash (\) shown in the line indicates line continuation and is not included in the actual file.)

```
# dt:3:once:/usr/dt/bin/dtlogin -daemon < /dev/console > \
/dev/console 2>&1
```

CDEART100 cannot be deinstalled while CDE is actively in use. To remove the subset, the request must come from one of the following:

- a remote session
- an ASCII Console
- a DECwindow/XDM Session

C.3 DEC Ada Run-Time Library Support for DEC OSF/1 Alpha Systems (ADALIB)

The Ada Run-Time Library subset is included on the DEC OSF/1 CD-ROM to facilitate deployment of applications built using DEC Ada.

The following table describes the contents of the DEC Ada Run-Time Library kit:

File Name	Description
libada.so	DEC Ada Run-Time Library, shared object
libada.a	DEC Ada Run-Time Library, archive library

Inclusion of the DEC Ada Run-Time Library in the base system allows end users to run applications that were linked with the DEC Ada (run-time) libraries without requiring the end user to purchase DEC Ada.

To install the DEC Ada Run-Time Library subset from the distribution CD-ROM, log in as root (or become superuser) and follow the steps described in Chapter 8 for installing software subsets or enter the following command:

```
# setld -i /mnt/ALPHA/DEC_Ada_RTL
```

Choose the DEC Ada Run-Time Library subset from the menu.

If you are performing a Remote Installation Services (RIS) installation of your software, choose the DEC Ada Run-Time Library subset from the RIS menu. Use the following command to install the subset:

```
# setld -i hostname:
```

Replace *hostname:* with the name of your RIS server appended with a colon (:).

C.4 Development Enhancements (Compiler) for DEC OSF/1 Alpha Systems (CMPDEVENH)

The following is a brief guide to the most important items in this subset. See the product documentation for a full description.

There are static and shared libraries which contain the `malloc()` system call as it was implemented in DEC OSF/1 V1.2 and V1.3. The libraries are shipped to ensure backwards compatibility with previous versions of DEC OSF/1.

The file `mmap_32.c` is a C source file that provides a jacket for the `mmap()` system call. This is provided to support the Truncated Address Support Option (TASO) in DEC OSF/1 Version 1.3. refer to the TASO documentation for more information if your TASO code contains `mmap()` calls.

To install the Compiler Development Enhancements subset from CD-ROM, become superuser or root and follow the steps described in Chapter 8 for installing software subsets. Enter the command:

```
# setld -i /mnt/ALPHA/COMPILERS
```

Choose the Compiler Development Enhancements subset from the menu.

If you are doing a Remote Installation Services (RIS) installation of your software, choose the Compiler Development Enhancements subset from the RIS menu. Use the following command to install the subset:

```
# setld -i hostname:
```

Replace *hostname:* with the name of your RIS server appended with a colon (:).

C.5 DECladebug for DEC OSF/1 Alpha Systems (LDBBASE and LDBSRV)

The DECladebug Debugger is a symbolic source-level debugger that currently supports debugging of Ada, C/C++, Fortran, and Fortran 90 applications. DECladebug has a command line interface similar to `dbx` and a graphical user interface.

To install the DECladebug Debugger subset from CD-ROM, become superuser or root and follow the steps described in Chapter 8 for installing software subsets. Enter the command:

```
# setld -l /mnt/ALPHA/DECLADEBUG
```

Choose the DECladebug Debugger subset from the menu.

The `setld` utility presents you with a menu from which you can install either the debugger or the Bookreader subset, or you can install both subsets.

After you install the Bookreader subset, you can invoke the online version of the *DECladebug Debugger Manual: Command-Line Interface* by entering the following command. (If you have not set up your workstation or server to access the Bookreader documentation, follow the instructions in Chapter 6.)

```
# dxbook decladebug.book &
```

If you are doing a RIS installation of your software, choose the DECladebug subset from the RIS menu. Use the following command to install the subset:

```
# setld -l hostname:
```

Replace `hostname:` with the name of your RIS server appended with a colon (:).

You must have the DEC C++ shared library kits installed before you can invoke DECladebug. For DEC OSF/1 Version 2.0, the kit is named CXXSHRDA131. For DEC OSF/1 Version 3.2, the kit is named CXXSHRDA201.

C.6 DEC C++ RTL for DEC OSF/1 Alpha Systems (CXXSHRDA)

The C++ Run-Time Libraries subset is included on the DEC OSF/1 CD-ROM to facilitate deployment of applications built using DEC C++.

The following table describes the contents of the DEC C++ Run-Time Libraries kit:

File Name	Description
libcxx.so	DEC C++ language support, iostream and miscellaneous class libraries
libcomplex.so	DEC C++ complex class
libtask.so	DEC C++ task classes
cxx1.cat	DEC C++ RTL message catalog

Inclusion of the DEC C++ Run-Time Libraries in the base system allows end users to run applications that were linked with the DEC C++ shared object (run-time) libraries, without requiring the end user to purchase DEC C++.

To install the DEC C++ Run-Time Libraries subset from CD-ROM, become superuser or root and follow the steps described in Chapter 8 for installing software subsets. Enter the command:

```
# setid -l /mnt/ALPHA/DEC_C++_RTL
```

Choose the DEC C++ Run-Time Libraries subset from the menu.

If you are doing a RIS installation of your software, choose the DEC C++ Run-Time Libraries subset from the RIS menu. Use the following command to install the subset:

```
# setid -l hostname:
```

Replace *hostname:* with the name of your RIS server appended with a colon (:).

C.7 DEC COBOL Run-Time Support Library for DEC OSF/1 Systems (DCARTL)

DEC COBOL Run-Time Support Library for DEC OSF/1 Alpha Systems is a software library that provides compiled code support for file processing, format processing, I/O processing and other capabilities to the DEC COBOL programming language implementation. The DEC Fortran for DEC OSF/1 Alpha Run-Time Support subsets must be installed at the same time as the DEC COBOL Run-Time Support subsets.

This subset contains:

- DCARTL210 - DEC COBOL Run-Time Support Library
- O2ABASE210 - DEC Decimal Run-Time Support Library

Both subsets must be installed together. The following table lists the contents of the DCARTL210 subset:

File Name	Description
libcob.a	DEC COBOL Run Time (archive) library
libcob.so	DEC COBOL Run Time (shared) library
libisam_stub.a	DEC COBOL ISAM stub (archive) library
cob_msg.cat	DEC COBOL Run Time library message catalog

The following table lists the contents of the O2ABASE210 subset:

File Name	Description
libots2.a	DEC Decimal Support Run Time (archive) Library
libots2.so	DEC Decimal Support Run Time (shared) Library

To install the DEC COBOL Run-Time Support Library subset from CD-ROM, become superuser or root and follow the steps described in Chapter 8 for installing software subsets. Enter the command:

```
# setid -l /mnt/ALPHA/DEC_Cobol_RTL
```

Choose both subsets from the menu.

If you are doing a RIS installation of your software, choose the DCARTL210 subset from the RIS menu. Use the following command to install the subset:

```
# setid -l hostname:
```

Replace *hostname:* with the name of your RIS server appended with a colon (:).

C.8 DEC Fortran for DEC OSF/1 Alpha Run-Time Support (DFARTL)

This section discusses the DEC Fortran for DEC OSF/1 Alpha Run-Time Support subset.

The DEC Fortran for DEC OSF/1 Alpha Run-Time Support is a software library that provides compiled code support for file processing, format processing, I/O processing and other capabilities to the DEC Fortran

programming language implementation. The following table lists the contents of the DEC Fortran for DEC OSF/1 Alpha Run-Time Support kit:

File Name	Description
<code>libFutil.a</code>	DEC Convert RTL
<code>libUfor.a</code>	DEC Fortran Unsupported RTL
<code>libfor.a</code>	DEC Fortran RTL
<code>libFutil.so</code>	DEC Convert RTL
<code>libUfor.so</code>	DEC Fortran Unsupported RTL
<code>libfor.so</code>	DEC Fortran RTL
<code>for_msg.cat</code>	DEC Fortran RTL Message Catalog

To install the DEC Fortran for DEC OSF/1 Alpha Run-Time Support subset from CD-ROM become superuser or root and follow the steps described in Chapter 8 for installing software subsets. Enter the command:

```
# setid -i /mnt/ALPHA/DEC_Fortran_RTL
```

Choose the DEC Fortran for DEC OSF/1 Alpha Run-Time Support subset from the menu.

If you are doing a RIS installation of your software, choose the DEC Fortran Run-Time Support subset from the RIS menu. Use the following command to install the subset:

```
# setid -i hostname:
```

Replace *hostname:* with the name of your RIS server appended with a colon (:).

C.9 DEC Pascal for DEC OSF/1 Alpha Run-Time Support (DPORTL)

The DEC Pascal for DEC OSF/1 Alpha Run-Time Support is a software library that provides compiled code support for file processing, format processing, I/O processing and other capabilities to the DEC Pascal programming language implementation. The DEC Fortran for DEC OSF/1 Alpha Run-Time Support subsets must be installed at the same time as the DEC Pascal for DEC OSF/1 Alpha Run-Time Support Library subset.

File Name	Description
libpas.a	DEC Pascal RTL
libpas.so	
libpas_msg.cat	DEC Pascal RTL message catalog

To install the DEC Pascal for DEC OSF/1 Alpha Run-Time Support subset from CD-ROM, become superuser or root and follow the steps described in Chapter 8 for installing software subsets. Enter the command:

```
# setid -l /mnt/ALPHA/DEC_Pascal_RTL
```

Choose the DEC Pascal for DEC OSF/1 Alpha Run-Time Support subset from the menu.

If you are doing a RIS installation of your software, choose the DEC Pascal for DEC OSF/1 Alpha Run-Time Support subset from the RIS menu. Use the following command to install the subset:

```
# setid -l hostname:
```

Replace *hostname:* with the name of your RIS server appended with a colon (:).

C.10 GNU awk Source (FSFGAWKSRC)

The GNU awk Source subset contains source files for the GNU awk programming language.

To install the GNU awk Source subset from CD-ROM, become superuser or root and follow the steps described in Chapter 8 for installing software subsets. Enter the command:

```
# setid -l /mnt/ALPHA/GNUSRC
```

Choose the GNU awk Source subset from the menu.

If you are doing a RIS installation of your software, choose the GNU awk Source subset from the RIS menu. Use the following command to install the subset:

```
# setid -l hostname:
```

Replace *hostname:* with the name of your RIS server appended with a colon (:).

C.11 GNU Emacs Source (FSFEMACSSRC)

The GNU Emacs Source subset contains the source files for the GNU Emacs editor. The subset OSFBASE320 must be installed.

To install the GNU Emacs Source subset from CD-ROM become superuser or root and follow the steps described in Chapter 8 for installing software subsets. Enter the command:

```
# setld -l /mnt/ALPHA/GNUSRC
```

Choose the GNU Emacs Source subset from the menu.

If you are doing a RIS (Remote Installation Services) installation of your software, choose the GNU Emacs Source subset from the RIS menu. Use the following command to install the subset:

```
# setld -l hostname:
```

Replace *hostname*: with the name of your RIS server appended with a colon (:).

C.12 GNU Revision Control System Source (FSFRCSSRC)

GNU Revision Control System Source subset contains source files for the GNU Revision Control System (RCS).

To install the GNU Revision Control System Source subset from CD-ROM, become superuser or root and follow the steps described in Chapter 8 for installing software subsets. Enter the command:

```
# setld -l /mnt/ALPHA/GNUSRC
```

Choose the GNU Revision Control System Source subset from the menu.

If you are doing a RIS installation of your software, choose the GNU Revision Control System Source subset from the RIS menu. Use the following command to install the subset:

```
# setld -l hostname:
```

Replace *hostname*: with the name of your RIS server appended with a colon (:).

C.13 NetWorker SingleServer Save and Restore (BRXNSSALPHA)

NetWorker SingleServer Save and Restore (NetWorker SingleServer) is a graphical utility that backs up and restores local files on a single local system to a local tape or loader. Currently, a DEC OSF/1 user must know what utility (*tar*, *cpio*, *dump/restore*, or *vdump/vrestore*) was used to perform a backup in order to do a restore.

NetWorker SingleServer is a subset of Digital's POLYCENTER NetWorker Save and Restore product and is licensed free of charge with the DEC OSF/1 base operating system.

The OSF-BASE Product Authorization Key (PAK) gives you a license to install and use SingleServer; you do not need to load and register a special PAK.

After you install the NetWorker SingleServer subset, postscript files containing the following documents are automatically loaded into `/usr/opt/BRX301/usr/doc`:

- *NetWorker SingleServer Save and Restore for DEC OSF/1 Alpha Systems*
- *NetWorker User's Guide* (published by Legato Systems, Inc.)
- *NetWorker Administrator's Guide* (published by Legato Systems, Inc.)
- *POLYCENTER NetWorker Save and Restore Addendum*
- *POLYCENTER NetWorker Save and Restore Release Notes*
- A file, `NSS_DOC_README.txt`, describes the contents of these documents.

If you are installing NetWorker SingleServer software subsets from the DEC OSF/1 CD-ROM, mount the CD-ROM, and as superuser or `root` enter the following command:

```
# setld -l /mnt/ALPHA/NetWorker_SingleServer BRXNSSALPHA301
```

To install the reference pages associated with NetWorker SingleServer, use the previous command and replace the subset name with `BRXNSSMAN301`.

If you are performing a RIS installation of the SingleServer software subsets, enter the following command to begin the RIS installation:

```
# setld -l hostname:
```

Replace `hostname:` with the name of your RIS server appended with a colon (:). The `setld` command displays a numbered list of subsets available to install. Choose the NetWorker SingleServer subsets from the menu.

During the installation, you are asked if you want to start the NetWorker daemons. If you enter `no`, the daemons will be started when the system is rebooted. To start the daemons manually without rebooting, refer to the `nsrd(8)` reference page (to access this reference page you must have installed the `BRXNSSMAN301` subset and must have run the `catman -w` command to update the `what is` database).

C.14 Sort Library (SORLIB)

The Sort subset provides a run-time library of sort routines that provide applications programming interface compatibility with a subset of the OpenVMS sort utility. This functionality is provided to assist in the migration to DEC OSF/1 of several OpenVMS products that depend on OpenVMS SORT. It also provides a high performance sort package that

takes advantage of the Alpha architecture for better performance.

The following table lists the contents of the SORLIB201 subset.

File Name	Description
<code>libsort.so</code>	Shareable object of Sort RTL routines
<code>libsort.a</code>	Library of Sort RTL routines
<code>libsort.cat</code>	Sort message catalog

To install the Sort subset from CD-ROM, become superuser or root and follow the steps described in Chapter 8 for installing software subsets. Enter the command:

```
# setld -l /mnt/ALPHA/DEC_Sort_RTL
```

Choose the SORLIB201 subset from the menu.

If you are doing a RIS installation of your software, choose the Sort subset from the RIS menu. Use the following command to install the subset:

```
# setld -l hostname:
```

Replace *hostname:* with the name of your RIS server appended with a colon (:).

C.15 X11R6 Advanced Developer's Kit

The X11R6 Advanced Developers Kit allows developers to get an advanced start at using the new features provided by the sixth release of the X Window System.

This kit is provided in three subsets. All subsets may be used independently. All files in these kits will be installed under `/usr/opt/XR6320`, with symbolic links from `/usr/X11R6` and `/var/X11R6`. The three subsets in the X11R6 kit are:

- **XR6SERVER320**

Provides an R6 X Server and Font server. Refer to the `/usr/X11R6/README.server` file for a summary of new features and known limitations. Approximate disk requirements are 9 MB.

- **XR6PROG320**

Provides for X Window System library development based on the R6 version of the X Consortium libraries. Also included in this set are OSF/Motif libraries based on Version 1.2.3. These development libraries are binarily incompatible with the X11R5 libraries that are provided (the default X development libraries for DEC OSF/1) and are also

incompatible with those in the Common Desktop Environment (CDE) ADK. Refer to the `/usr/X11R6/README.programming` file for a summary of new features and known limitations. Approximate disk requirements are 40 MB.

- **XR6DOC320**

Contains documentation that is available for new features of the R6 release and man pages. Approximate disk requirements are 12 MB. Refer to the file `/usr/X11R6/README.documents` for more information.

Use the `setld` command to install the X11R6 subsets. If you are installing the X11R6 subsets from the DEC OSF/1 CD-ROM, mount the CD-ROM, and as superuser or `root` enter the following command:

```
# setld -l /mnt/ALPHA/XR6 XR6SERVER320 XR6PROG320 XR6DOC320
```

If you are performing a RIS installation of the X11R6 software subsets, enter the following command to begin the RIS installation:

```
# setld -l hostname:
```

Replace `hostname:` with the name of your RIS server appended with a colon (:). The `setld` command displays a numbered list of subsets available to install. Choose the X11R6 subsets from the menu.

If insufficient space exists in the partition containing `/usr/opt`, mount a new partition at `/usr/opt/XR6320` or create `/usr/opt/XR6320` as a symbolic link to a directory in a partition that has sufficient space.

C.16 Worldwide Support

DEC OSF/1 Alpha International Support provides the following subsets to support international implementations. These subsets are located on the CD-ROM labeled *Disc 1 - DEC OSF/1 Operating System V3.2* in the `/ALPHA/WORLDWIDE/BASE` directory:

- DEC OSF/1 Worldwide Support
- DEC OSF/1 Czech Support
- DEC OSF/1 German Support
- DEC OSF/1 Greek Support
- DEC OSF/1 Spanish Support
- DEC OSF/1 French Support
- DEC OSF/1 Hungarian Support
- DEC OSF/1 Italian Support
- DEC OSF/1 Hebrew Support

- DEC OSF/1 Japanese Support
- DEC OSF/1 Korean Support
- DEC OSF/1 Polish Support
- DEC OSF/1 Russian Support
- DEC OSF/1 Slovak Support
- DEC OSF/1 Swedish Support
- DEC OSF/1 Thai Support
- DEC OSF/1 Turkish Support
- DEC OSF/1 Chinese Support

An installation script is provided in `/ALPHA/WORLDWIDE/wwinstall` and documentation is located in `/DOCUMENTATION/POSTSCRIPT` and `/DOCUMENTATION/TEXT` on the CD-ROM. The documentation covers installation and use of the utilities in each subset. Text and PostScript versions of the books are available.

There is no license registration required for the international subsets.

C.16.1 DEC OSF/1 Worldwide Support

DEC OSF/1 Worldwide Support provides the following subsets:

- IOSWWBASE320 Worldwide Base System (Operating System)
- IOSWWBIN320 Worldwide Standard Kernel Objects (Operating System)
- IOSWWBINCOM320 Worldwide Kernel Headers and Common Files (Operating System)
- IOSWWDECW320 Worldwide Additional DECwindows Applications (Operating System)
- IOSWWFONT320 Worldwide DECwindows Fonts (Windowing Environment)
- IOSWWLAT2FONT15320 Worldwide ISO-LATIN2 DECwindows 100dpi Fonts (Windowing Environment)
- IOSWWLAT2FONT320 Worldwide ISO-LATIN2 DECwindows 75dpi Fonts (Windowing Environment)
- IOSWWLATCFONT15320 Worldwide ISO-LATIN Cyrillic DECwindows 100dpi Fonts (Windowing Environment)
- IOSWWLATCFONT320 Worldwide ISO-LATIN Cyrillic DECwindows 75dpi Fonts (Windowing Environment)
- IOSWWMANOS320 Worldwide Support English Reference Pages (Operating System)

- IOSWWMH320 Worldwide Mail Handler (Operating System)
- IOSWWPHRASE320 Worldwide Phrase Input Support (Operating System)
- IOSWWPRINT320 Worldwide Printer Support (Operating System)
- IOSWWUDCOS320 Worldwide User Defined Character Support (Operating System)
- IOSWWUDCWOS320 Worldwide User Defined Character Workstation Service (Windowing Environment)
- IOSWWX11320 Worldwide Basic X Environment (Windowing Environment)
- IOSWWXDEV320 Worldwide X Window Software Development (Windowing Environment)
- IOSWWXMAIL320 Worldwide DECwindows Mail Interface (Windowing Environment)

C.16.2 DEC OSF/1 Czech Support

DEC OSF/1 Czech Support Version 3.2 contains the following subsets:

- IOSCSDECW320 Czech Additional DECwindows Applications (Windowing Environment)
- IOSCSX11320 Czech Basic X Environment (Windowing Environment)
- IOSCSXCDA320 Czech CDA Workstation Base Services (Windowing Environment)
- IOSCSXDEV320 Czech X Window Software Development (Windowing Environment)
- IOSCSXMAIL320 Czech DECwindows Mail Interface (Windowing Environment)

C.16.3 DEC OSF/1 German Support

DEC OSF/1 German Support Version 3.2 contains the following subsets:

- IOSDEDECW320 German Additional DECwindows Applications (Windowing Environment)
- IOSDEX11320 German Basic X Environment (Windowing Environment)
- IOSDEXCDA320 German CDA Workstation Base Services (Windowing Environment)
- IOSDEXDEV320 German X Window Software Development (Windowing Environment)

- IOSDEXMAIL320 German DECwindows Mail Interface (Windowing Environment)

C.16.4 DEC OSF/1 Greek Support

DEC OSF/1 Greek Support Version 3.2 provides the following subsets:

- IOSELDECW320 Greek Additional DECwindows Applications (Windowing Environment)
- IOSELFONT15320 Greek DECwindows 100dpi Fonts (Windowing Environment)
- IOSELFONT320 Greek DECwindows 75dpi Fonts (Windowing Environment)
- IOSELX11320 Greek Basic X Environment (Windowing Environment)
- IOSELXMAIL320 Greek DECwindows Mail Interface (Windowing Environment)

C.16.5 DEC OSF/1 Spanish Support

DEC OSF/1 Spanish Support Version 3.2 contains the following subsets:

- IOSESDECW320 Spanish Additional DECwindows Applications (Windowing Environment)
- IOSESX11320 Spanish Basic X Environment (Windowing Environment)
- IOSESXCDA320 Spanish CDA Workstation Base Services (Windowing Environment)
- IOSESXDEV320 Spanish X Window Software Development (Windowing Environment)
- IOSESXMAIL320 Spanish DECwindows Mail Interface (Windowing Environment)

C.16.6 DEC OSF/1 French Support

DEC OSF/1 French Support Version 3.2 contains the following subsets:

- IOSFRDECW320 French Additional DECwindows Applications (Windowing Environment)
- IOSFRX11320 French Basic X Environment (Windowing Environment)
- IOSFRXCDA320 French CDA Workstation Base Services (Windowing Environment)
- IOSFRXDEV320 French X Window Software Development (Windowing Environment)

- IOSFRXMAIL320 French DECwindows Mail Interface (Windowing Environment)

C.16.7 DEC OSF/1 Hungarian Support

DEC OSF/1 Hungarian Support Version 3.2 contains the following subsets:

- IOSHUDECW320 Hungarian Additional DECwindows Applications (Windowing Environment)
- IOSHUX11320 Hungarian Basic X Environment (Windowing Environment)
- IOSHUXCDA320 Hungarian CDA Workstation Base Services (Windowing Environment)
- IOSHUXDEV320 Hungarian X Window Software Development (Windowing Environment)
- IOSHUXMAIL320 Hungarian DECwindows Mail Interface (Windowing Environment)

C.16.8 DEC OSF/1 Italian Support

DEC OSF/1 Italian Support Version 3.2 contains the following subsets:

- IOSITDECW320 Italian Additional DECwindows Applications (Windowing Environment)
- IOSITX11320 Italian Basic X Environment (Windowing Environment)
- IOSITXCDA320 Italian CDA Workstation Base Services (Windowing Environment)
- IOSITXDEV320 Italian X Window Software Development (Windowing Environment)
- IOSITXMAIL320 Italian DECwindows Mail Interface (Windowing Environment)

C.16.9 DEC OSF/1 Hebrew Support

DEC OSF/1 Hebrew Support Version 3.2 contains the following subsets:

- IOSIWBASE320 Hebrew Base System (Required)
- IOSIWFONT15320 Hebrew DECwindows 100dpi Fonts (Windowing Environment)
- IOSIWFONT320 Hebrew DECwindows 75dpi Fonts (Windowing Environment)

- IOSIWX11320 Hebrew Basic X Environment (Windowing Environment)
- IOSIWXDEV320 Hebrew X Window Software Development (Windowing Environment)

C.16.10 DEC OSF/1 Japanese Support

DEC OSF/1 Japanese Support Version 3.2 provides the following subsets:

- IOSJPABASE320 Additional Japanese Software (Operating System)
- IOSJPAMANOS320 Japanese Ref. Pages for Additional Software (Operating System)
- IOSJPAMANOSSJIS320 SJIS Japanese Ref. Pages for Additional Software (Operating System)
- IOSJPBASE320 Japanese Base System (Required)
- IOSJPDECW320 Japanese Additional DECwindows Applications (Windowing Environment)
- IOSJPFONT15320 Japanese DECwindows 100dpi Fonts (Windowing Environment)
- IOSJPFONT320 Japanese DECwindows 75dpi Fonts (Windowing Environment)
- IOSJPMANOS320 Japanese Reference Pages (Operating System)
- IOSJPMANOSSJIS320 Japanese (SJIS) Reference Pages (Operating System)
- IOSJPMANWOS320 Japanese Windows Reference Pages (Windowing Environment)
- IOSJPMSG320 Japanese Message Catalogs (Operating System)
- IOSJPMSGSJIS320 SJIS Formatted Japanese Message Catalogs (Operating System)
- IOSJPNEMACS320 Japanese Nemacs (Operating System)
- IOSJPPGMR320 Japanese Software Development (Operating System)
- IOSJPSJISMANOS320 SJIS Formatted Japanese Reference Pages (Operating System)
- IOSJPWNN320 Wnn Input Method (Operating System)
- IOSJPWNNPGMR320 Wnn Software Development (Operating System)
- IOSJPX11320 Japanese Basic X Environment (Windowing Environment)
- IOSJPXCDA320 Japanese CDA Workstation Base Services (Windowing Environment)

- IOSJPXDEV320 Japanese X Window Software Development (Windowing Environment)
- IOSJPXMAIL320 Japanese DECwindows Mail Interface (Windowing Environment)

C.16.11 DEC OSF/1 Korean Support

DEC OSF/1 Korean Support Version 3.2 provides the following subsets:

- IOSKOBASE320 Korean Base System (Required)
- IOSKODECW320 Korean Additional DECwindows Applications (Windowing Environment)
- IOSKOFONT320 Korean DECwindows Fonts (Windowing Environment)
- IOSKOFONT2320 Korean DECwindows Optional Fonts (Windowing Environment)
- IOSKOX11320 Korean Basic X Environment (Windowing Environment)
- IOSKOXCDA320 Korean CDA Workstation Base Services (Windowing Environment)
- IOSKOXDEV320 Korean X Window Software Development (Windowing Environment)
- IOSKOXMAIL320 Korean DECwindows Mail Interface (Windowing Environment)

C.16.12 DEC OSF/1 Polish Support

DEC OSF/1 Polish Support Version 3.2 provides the following subsets:

- IOSPLDECW320 Polish Additional DECwindows Applications (Windowing Environment)
- IOSPLX11320 Polish Basic X Environment (Windowing Environment)
- IOSPLXCDA320 Polish CDA Workstation Base Services (Windowing Environment)
- IOSPLXDEV320 Polish X Window Software Development (Windowing Environment)
- IOSPLXMAIL320 Polish DECwindows Mail Interface (Windowing Environment)

C.16.13 DEC OSF/1 Russian Support

DEC OSF/1 Russian Support Version 3.2 provides the following subsets:

- IOSRUDECW320 Russian Additional DECwindows Applications (Windowing Environment)
- IOSRUX11320 Russian Basic X Environment (Windowing Environment)
- IOSRUXCDA320 Russian CDA Workstation Base Services (Windowing Environment)
- IOSRUXDEV320 Russian X Window Software Development (Windowing Environment)
- IOSRUXMAIL320 Russian DECwindows Mail Interface (Windowing Environment)

C.16.14 DEC OSF/1 Slovak Support

DEC OSF/1 Slovak Support Version 3.2 provides the following subsets:

- IOSSKDECW320 Slovak Additional DECwindows Applications (Windowing Environment)
- IOSSKX11320 Slovak Basic X Environment (Windowing Environment)
- IOSSKXCDA320 Slovak CDA Workstation Base Services (Windowing Environment)
- IOSSKXDEV320 Slovak X Window Software Development (Windowing Environment)
- IOSSKXMAIL320 Slovak DECwindows Mail Interface (Windowing Environment)

C.16.15 DEC OSF/1 Swedish Support

DEC OSF/1 Swedish Support Version 3.2 provides the following subsets:

- IOSSVDECW320 Swedish Additional DECwindows Applications (Windowing Environment)
- IOSSVX11320 Swedish Basic X Environment (Windowing Environment)
- IOSSVXCDA320 Swedish CDA Workstation Base Services (Windowing Environment)
- IOSSVXDEV320 Swedish X Window Software Development (Windowing Environment)
- IOSSVXMAIL320 Swedish DECwindows Mail Interface (Windowing Environment)

C.16.16 DEC OSF/1 Thai Support

DEC OSF/1 Thai Support Version 3.2 provides the following subsets:

- IOSTHBASE320 Thai Base System (Required)
IOSIBASE320 Internationalized Base System is required for this subset
- IOSIBIN320 Standard Kernel Objects (Operating System)
- IOSTHDECW320 Thai Additional DECwindows Applications (Windowing Environment)
- IOSTHFONT320 Thai DECwindows Fonts (Windowing Environment)
- IOSTHPRINT320 Thai Printer Support Environment (Operating System)
- IOSTHX11320 Thai Basic X Environment (Windowing Environment)
- IOSTHXDEV320 Thai X Window Software Development (Windowing Environment)
- IOSTHXCDA320 Thai CDA Workstation Base Services (Windowing Environment)
- IOSTHXMAIL320 Thai DECwindows Mail Interface (Windowing Environment)

C.16.17 DEC OSF/1 Turkish Support

DEC OSF/1 Turkish Support Version 3.2 provides the following subsets:

- IOSTRDECW320 Turkish Additional DECwindows Applications (Windowing Environment)
- IOSTRFONT15320 Turkish DECwindows 100dpi Fonts (Windowing Environment)
- IOSTRFONT320 Turkish DECwindows 75dpi Fonts (Windowing Environment)
- IOSTRX11320 Turkish Basic X Environment (Windowing Environment)
- IOSTRXMAIL320 Turkish DECwindows Mail Interface (Windowing Environment).

C.16.18 DEC OSF/1 Chinese Support

DEC OSF/1 Chinese Support Version 3.2 provides the following subsets:

- IOSZHBASE320 Chinese Base System (Required)
- IOSZHBIG5320 Big-5 Character Set Support (Operating System)
- IOSZHCBASE320 Chinese Base System for China (Operating System)

- IOSZHCNLOC320 Additional Chinese Locales for China (Operating System)
- IOSZHCONV320 Traditional and Simplified Chinese Conversion (Operating System)
- IOSZHEUCTW320 Taiwanese EUC Character Set Support (Operating System)
- IOSZHHANYU320 DEC Hanyu Character Set Support (Operating System)
- IOSZHHANZI320 DEC Hanzi Character Set Support (Operating System)
- IOSZHHKBASE320 Chinese Base System for Hong Kong (Operating System)
- IOSZHMTELEX320 Mitac Telex Character Set Support (Operating System)
- IOSZHSDECW320 Simplified Chinese Additional DECwindows Applications (Windowing Environment)
- IOSZHSFONT2320 Simplified Chinese DECwindows Optional Fonts (Windowing Environment)
- IOSZHSFONT320 Simplified Chinese DECwindows Fonts (Windowing Environment)
- IOSZHSX11320 Simplified Chinese Basic X Environment (Windowing Environment)
- IOSZHSXCDA320 Simplified Chinese CDA Workstation Base Services (Windowing Environment)
- IOSZHSXDEV320 Simplified Chinese X Window Software Development (Windowing Environment)
- IOSZHSXMAIL320 Simplified Chinese DECwindows Mail Interface (Windowing Environment)
- IOSZHTDECW320 Traditional Chinese Additional DECwindows Applications (Windowing Environment)
- IOSZHTFONT2320 Traditional Chinese DECwindows Optional Fonts (Windowing Environment)
- IOSZHTFONT320 Traditional Chinese DECwindows Fonts (Windowing Environment)
- IOSZHTWBASE320 Chinese Base System for Taiwan (Operating System)
- IOSZHTWLOC320 Additional Chinese Locales for Taiwan (Operating System)

- IOSZHTX11320 Traditional Chinese Basic X Environment (Windowing Environment)
- IOSZHTXCDA320 Traditional Chinese CDA Workstation Base Services (Windowing Environment)
- IOSZHTXDEV320 Traditional Chinese X Window Software Development (Windowing Environment)
- IOSZHTXMAIL320 Traditional Chinese DECwindows Mail Interface (Windowing Environment)
- IOSZHX11320 Base Chinese X Environment (Windowing Environment)

C.17 Additional International Support

The following international subsets are located in
/ALPHA/WORLDWIDE/SRCS:

- IOSJPNEMACSSRC320 Japanese Nemacs Source Files (Operating System)
- IOSJPWNSRC320 Japanese Wnn Source Files (Operating System)

The following international subsets are located in
/ALPHA/WORLDWIDE/FONT:

- IOSELOLFONT320 Greek Outline Fonts
- IOSIWOLFONT320 Hebrew Outline Fonts
- IOSKOOLFONT320 Korean Outline Fonts
- IOSTHOLFONT320 Thai Outline Fonts
- IOSTROLFONT320 Turkish Outline Fonts
- IOSWWLAT2OLFONT320 Latin 2 Outline Fonts
- IOSWWLATCOLFONT320 Latin Cyrillic Outline Fonts
- IOSZHSOLFONT320 Simplified Chinese Outline Fonts
- IOSZHTOLFONT320 Traditional Chinese Outline Fonts

Disk Partition Information **D**

This appendix provides disk partition information for the supported Digital Storage Architecture (DSA) and Small Computer System Interface (SCSI) disk drives. This information will help you complete the tables in Chapter 3.

See Section D.1 for a list of the supported DSA disk drives. See Section D.2 for a list of the supported SCSI disk drives.

D.1 DSA Disk Drives

The following **ra** disks are supported:

- RA60
- RA71, RA72, RA73
- RA81, RA82
- RA90, RA92

This section includes partition information for each of these disks.

RA60 Partitions

Partition	Start	End	Block Size	MB	Overlap
a	0	40959	40960	20	c
b	40960	82927	41968	20	c
c	0	400175	400176	195	a, b, d, e, f, g, h
d	242928	295343	52416	26	c, h
e	295344	347759	52416	26	c, h
f	347760	400175	52416	26	c, h
g	82928	242927	160000	78	c
h	242928	400175	157248	77	c, d, e, f

RA71 Partitions

Partition	Start	End	Block Size	MB	Overlap
a	0	131071	131072	64	c
b	131072	393215	262144	128	c
c	0	1367309	1367310	668	a, b, d, e, f, g, h
d	393216	717913	324698	159	c, g
e	717914	1042611	324698	159	c, g
f	1042612	1367309	324698	159	c, g, h
g	393216	1212415	819200	400	c, d, e, f
h	1212416	1367309	154894	76	c, f

RA72 Partitions

Partition	Start	End	Block Size	MB	Overlap
a	0	131071	131072	64	c
b	131072	393215	262144	128	c
c	0	1953299	1953300	954	a, b, d, e, f, g, h
d	393216	913243	520028	254	c, g
e	913244	1433271	520028	254	c, g, h
f	1433272	1953299	520028	254	c, h
g	393216	1212415	819200	400	c, d, e
h	1212416	1953299	740884	362	c, e, f

RA73 Partitions

Partition	Start	End	Block Size	MB	Overlap
a	0	131071	131072	64	c
b	131072	393215	262144	128	c
c	0	3920489	3920490	1914	a, b, d, e, f, g, h
d	393216	1568767	1175552	574	c, g, h
e	1568768	2744319	1175552	574	c, h
f	2744320	3920489	1176170	574	c, h
g	393216	1212415	819200	400	c, d
h	1212416	3920489	2708074	1322	c, d, e, f

RA90 Partitions

Partition	Start	End	Block Size	MB	Overlap
a	0	131071	131072	64	c
b	131072	393215	262144	128	c
c	0	2376152	2376153	1160	a, b, d, e, f, g, h
d	393216	1054194	660979	323	c, g
e	1054195	1715173	660979	323	c, g, h
f	1715174	2376152	660979	323	c, h
g	393216	1212415	819200	400	c, d, e
h	1212416	2376152	1163737	568	c, e, f

RA92 Partitions

Partition	Start	End	Block Size	MB	Overlap
a	0	131071	131072	64	c
b	131072	393215	262144	128	c
c	0	2940950	2940951	1436	a, b, d, e, f, g, h
d	393216	1054194	660979	323	c, g
e	1054195	1715173	660979	323	c, g, h
f	1715174	2376152	660979	323	c, h
g	393216	1212415	819200	400	c, d, e
h	1212416	2940950	1728535	844	c, e, f

RZ25L Partitions

Partition	Start	End	Block Size	MB	Overlap
a	0	131071	131072	64	c
b	131072	393215	262144	128	c
c	0	1046205	1046205	510	a, b, d, e, f, g
d	393216	610878	217663	106	c, g
e	610879	828541	217663	106	c, g
f	828542	1046205	146437	72	c, g
g	393216	1046205	439311	215	c, d, e, f
h	0	0	0	0	

RZ26 Partitions

Partition	Start	End	Block Size	MB	Overlap
a	0	131071	131072	64	c
b	131072	393215	262144	128	c
c	0	2050859	2050860	1001	a, b, d, e, f, g, h
d	393216	945763	552548	270	c, g
e	945764	1498311	552548	270	c, g, h
f	1498312	2050859	552548	270	c, h
g	393216	1212415	819200	400	c, d, e
h	1212416	2050859	838444	409	c, e, f

RZ28B Partitions

Partition	Start	End	Block Size	MB	Overlap
a	0	131071	131072	64	c
b	131072	532479	401408	196	c
c	0	4110480	4110480	2007	a, b, d, e, f, g, h
d	532480	1724415	1191936	581	c, g
e	1724416	2916351	1191936	581	c, g, h
f	2916352	4110480	1194129	583	c, h
g	532480	2320383	1787904	873	c, d, e
h	2320384	4110480	1790097	874	c, e, f

RZ55 Partitions

Partition	Start	End	Block Size	MB	Overlap
a	0	131071	131072	64	c
b	131072	393215	262144	128	c
c	0	649039	649040	317	a, b, g
d	0	0	0	0	
e	0	0	0	0	
f	0	0	0	0	
g	393216	649039	255824	125	c
h	0	0	0	0	

RZ73 Partitions

Partition	Start	End	Block Size	MB	Overlap
a	0	131071	131072	64	c
b	131072	393215	262144	128	c
c	0	3907910	3907911	1908	a, b, d, e, f, g, h
d	393216	1564780	1171565	572	c, g, h
e	1564781	2736345	1171565	572	c, h
f	2736346	3907910	1171565	572	c, h
g	393216	1212415	819200	400	c, d
h	1212416	3907910	2695495	1316	c, d, e, f

RZ74 Partitions

Partition	Start	End	Block Size	MB	Overlap
a	0	131071	131072	64	c
b	131072	524287	393216	192	c
c	0	6976374	6976375	3406	a, b, d, e, f, g, h
d	524288	2674687	2150400	1050	c, g
e	2674688	4825087	2150400	1050	c, g, h
f	4285088	6976374	2691287	1414	c, h
g	524287	3749887	3225600	1575	c, d, e
h	3749888	6976374	3226486	1575	c, e, f

Installation Error Messages

E

This appendix explains some of the error messages that you might encounter if there is a problem during an installation.

<string>: unknown machine type

The program used to determine the type of machine being installed has not found the expected Alpha architecture. The value of *string* is the value returned from the program.

The system installation cannot continue and you must contact your field service representative.

Do you want to quit the installation? (y/n) []:

For some special installation cases, the *Release Notes* may instruct you to press Ctrl/c and enter commands. In these cases, there will also be instructions on how to restart or continue the installation procedure.

If you answer y, it means that you want to terminate the installation and restart at the beginning. If you answer n, the installation procedure will continue.

No valid device is found. Contact a DIGITAL field service representative.

A device that is supported by the operating system as a valid distribution device cannot be found on the system.

Contact your Digital field service representative.

The MAKEDEV command could not make the special files on device <device name> This error causes the installation procedure to stop. One possible cause for the error is a corrupt system disk. You may want to replace or use another system disk, and begin the installation again. If this error message appears a second time, contact a DIGITAL representative.

The system is unable to create the device special file for the load device. The in-memory file system might not be mounted read-write. The MAKEDEV command might not understand how to create special files for the device.

Basic Installation Log

F

This appendix shows an example of a basic installation performed on a DEC 3000 processor. The exact text displayed by the installation software depends on the type of system you have and the type of media you are using, but the installation procedure for all systems and media is similar.

*** STANDALONE SYSTEM ENVIRONMENT ***

Select the BASIC option to install the mandatory software subsets for your system configuration.

Select the ADVANCED option to display optional software subsets from a menu and/or customize system disks and partitions.

Select the SYSTEM MANAGEMENT option to customize disk partitions on the system disk.

Select one of the following options:

- 1) BASIC Installation
- 2) ADVANCED Installation
- 3) SYSTEM Management

Enter your choice: 1

*** SYSTEM DISK SELECTION ***

The Installation Guide explains the following table of system disk drives. Select one of the disks in the table to contain the root file system:

SYSTEM DISK TABLE

Selection	Device	Software	Device	Controller	
Controller	Name	Name	Number	Name	Number
1	RZ26L	rz0	0	SCSI	0
2	RZ26	rz3	3	SCSI	0
3	RZ58	rz8	8	SCSI	1

Enter your choice: 3

You selected RZ58, device number 8. Make sure this disk drive is online and write-enabled (if applicable to your disk drive),

Verifying
Working....Tue Jan 03 13:56:33 GMT 1995

Base System - Hardware Support
Copying from ds9 (inet)
Working....Tue Jan 03 13:57:08 GMT 1995
Verifying

Compiler Back End
Copying from ds9 (inet)
Working....Tue Jan 03 13:57:47 GMT 1995
Verifying

Kernel Header and Common Files
Copying from ds9 (inet)
Working....Tue Jan 03 13:58:40 GMT 1995
Verifying

Standard Kernel Objects
Copying from ds9 (inet)
Working....Tue Jan 03 13:59:51 GMT 1995
Verifying

Hardware Kernel Objects
Copying from ds9 (inet)
Working....Tue Jan 03 14:00:54 GMT 1995
Verifying

Hardware Kernel Header and Common Files
Copying from ds9 (inet)
Verifying

Basic Networking Services
Copying from ds9 (inet)
Verifying

X Servers
Copying from ds9 (inet)
Working....Tue Jan 03 14:02:44 GMT 1995
Verifying

Basic X Environment
Copying from ds9 (inet)
Working....Tue Jan 03 14:03:36 GMT 1995
Verifying

X Fonts
Copying from ds9 (inet)
Working....Tue Jan 03 14:04:58 GMT 1995
Verifying

DECwindows 100dpi Fonts
Copying from ds9 (inet)
Verifying

Adobe Fonts
Copying from ds9 (inet)
Verifying

NFS(tm) Utilities

Advanced Installation Log



This appendix shows an example of an advanced installation performed on a DEC 3000 processor. The exact text displayed by the installation software depends on the type of system you have and the type of media you are using, but the installation procedure for all systems and media is similar.

*** STANDALONE SYSTEM ENVIRONMENT ***

Select the BASIC option to install the mandatory software subsets for your system configuration.

Select the ADVANCED option to display optional software subsets from a menu and/or customize system disks and partitions.

Select the SYSTEM MANAGEMENT option to customize disk partitions on the system disk.

Select one of the following options:

- 1) BASIC Installation
- 2) ADVANCED Installation
- 3) SYSTEM Management

Enter your choice: 2

*** SYSTEM DISK SELECTION ***

The Installation Guide explains the following table of system disk drives. Select one of the disks in the table to contain the root file system:

SYSTEM DISK TABLE

Selection	Device Name	Software Name	Device Number	Controller Name	Controller Number
1	RZ26L	rz0	0	SCSI	0
2	RZ26	rz3	3	SCSI	0
3	RZ58	rz8	8	SCSI	1

Enter your choice: 3

You selected RZ58, device number 8. Make sure this disk drive is online and write-enabled (if applicable to your disk drive), then

online and write-enabled (if applicable), then confirm your choice.

Use RZ58, rz8 for /usr file system? (y/n) []: y

Select the rz8 partition on which the /usr file system will be mounted:

partition	start	size	end	overlap
b	131072	262144	393215	
d	393216	768281	1161496	g
e	1161497	768282	1929778	g, h
f	1929779	768282	2698060	h
g	393216	819200	1212415	d, e
h	1212416	1485645	2698060	e, f

Enter the letter specifying which partition to use: h

Use rz8 partition 'h' for the /usr file system (y/n) []? y

You can select to use the UNIX File System (ufs) or the Advanced File System (advfs) for the /usr file system. See Installation Guide for further information.

Select the file system type for the /usr file system (advfs/ufs) [ufs]: advfs

Making the new file system for /usr on /dev/rrz8h RZ58

*** Allocate the SWAP1 space

You can allocate the swap1 space to one of the disks listed in the table below. See the Installation Guide for an explanation of this table:

swap1 space ALLOCATION TABLE

Selection	Device Name	Software Name	Device Number	Controller Name	Controller Number
1	RZ26L	rz0	0	SCSI	0
2	RZ26	rz3	3	SCSI	0
3	RZ58	rz8	8	SCSI	1

Enter your choice: 2

You selected RZ26, device number 3. Make sure this disk is online and write-enabled (if applicable), then confirm your choice.

Use RZ26, rz3 for swap1 space? (y/n) []: y

Select the rz3 partition on which the swap1 space will be mounted:

Use rz0 partition 'b' for the swap2 space (y/n) []? y

*** Allocate the /var file system

The /var area of your system can either be placed in the /usr file system or on a separate file system.

Do you want to allocate a separate file system for /var? (y/n): y

You can allocate the /var file system to one of the disks listed in the table below. See the Installation Guide for an explanation of this table:

/var file system ALLOCATION TABLE

Selection	Device Name	Software Name	Device Number	Controller Name	Controller Number
1	RZ26L	rz0	0	SCSI	0
2	RZ26	rz3	3	SCSI	0
3	RZ58	rz8	8	SCSI	1

Enter your choice: 1

You selected RZ26L, device number 0. Make sure this disk is online and write-enabled (if applicable), then confirm your choice.

Use RZ26L, rz0 for /var file system? (y/n) []: y

Select the rz0 partition on which the /var file system will be mounted:

partition	start	size	end	overlap
a	----	0	131072	131071
d	----	393216	552548	945763
e	----	945764	552548	1498311
f	----	1498312	552548	2050859
g	----	393216	819200	1212415
h	----	1212416	838444	2050859

Enter the letter specifying which partition to use: g

Use rz0 partition 'g' for the /var file system (y/n) []? y

You can select to use the UNIX File System (ufs) or the Advanced File System (advfs) for the /var file system. See Installation Guide for further information.

Select the file system type for the /var file system (advfs/ufs) [ufs]: advfs

Making the new file system for /var on /dev/rrz0g RZ26L

*** Loading the operating system software subsets

- 17) Dataless Management Services
- 18) Remote Installation Service

--- MORE TO FOLLOW ---

Enter your choices or press RETURN to display the next screen.

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

- Printing Environment:
 - 19) Adobe Font Metric Files
 - 20) Local Printer Support
- Reference Pages:
 - 21) Ref Pages: Admin/User
 - 22) Ref Pages: Programming
 - 23) Ref Pages: Realtime
 - 24) Ref Pages: Windows Admin/User
 - 25) Ref Pages: Windows Programming
- Software Development:
 - 26) Additional Motif Demo Sources
 - 27) CDA(tm) Software Development
 - 28) CDA(tm) for X/Motif Development
 - 29) DEC C (cc -migrate)
 - 30) GNU Revision Control System
 - 31) LSM Software Development
 - 32) Realtime Software Development
 - 33) Software Development Environment
 - 34) Source Code Control System
 - 35) X Window Software Development
- Supplemental Documentation:
 - 36) XIE Version 5 Online Documentation
- System Administration:
 - 37) C2-Security
 - 38) C2-Security GUI
 - 39) Kernel Debugging Tools
 - 40) Obsolete Commands and Utilities
 - 41) Obsolete Locale databases
 - 42) Single-Byte European Locales
 - 43) System Accounting Utilities
 - 44) System Exercisers
 - 45) Verifier/Exerciser GUI
 - 46) Verifier/Exerciser Tool
- Text Processing:
 - 47) Doc. Preparation Tools
 - 48) Doc. Preparation Tools Extensions
- Windowing Environment:
 - 49) DECwindows 75dpi Fonts
 - 50) X Customizations for OEM
- Windows Applications:
 - 51) Additional DECwindows Applications
 - 52) Additional X Applications

--- MORE TO FOLLOW ---

Base System - Hardware Support
Copying from ds9 (inet)
Working....Tue Jan 03 00:13:46 GMT 1995
Verifying

Compiler Back End
Copying from ds9 (inet)
Working....Tue Jan 03 00:14:24 GMT 1995
Verifying

Kernel Header and Common Files
Copying from ds9 (inet)
Working....Tue Jan 03 00:15:09 GMT 1995
Verifying

Standard Kernel Objects
Copying from ds9 (inet)
Working....Tue Jan 03 00:16:06 GMT 1995
Verifying

Hardware Kernel Objects
Copying from ds9 (inet)
Working....Tue Jan 03 00:16:57 GMT 1995
Verifying

Hardware Kernel Header and Common Files
Copying from ds9 (inet)
Verifying

Basic Networking Services
Copying from ds9 (inet)
Verifying

X Servers
Copying from ds9 (inet)
Working....Tue Jan 03 00:18:37 GMT 1995
Verifying

Basic X Environment
Copying from ds9 (inet)
Working....Tue Jan 03 00:19:33 GMT 1995
Verifying

X Fonts
Copying from ds9 (inet)
Working....Tue Jan 03 00:20:48 GMT 1995
Verifying

DECwindows 100dpi Fonts
Copying from ds9 (inet)
Verifying

Adobe Fonts
Copying from ds9 (inet)
Verifying

NFS(tm) Utilities
Copying from ds9 (inet)
Verifying

System Configuration Log File

H

The following is a sample configuration log file:

*** SYSTEM CONFIGURATION ***

Configuring "Base System " (OSFBASE320)
Configuring "Base System - Hardware Support " (OSFHWBASE320)
Configuring "Compiler Back End " (OSFCMPLRS320)
Configuring "Kernel Header and Common Files " (OSFBINCOM320)
Configuring "Standard Kernel Objects " (OSFBIN320)
Configuring "Hardware Kernel Objects " (OSFHWBIN320)
Configuring "Hardware Kernel Header and Common Files"
(OSFHWBINCOM320)
Configuring "Logical Storage Manager Kernel Header and Common
Files" (OSFLSMBINCOM320)
Configuring "Basic Networking Services " (OSFCLINET320)
Configuring "X Servers " (OSFSER320)
Configuring "Basic X Environment " (OSFX11320)
Configuring "X Fonts " (OSFMITFONT320)
Configuring "DECwindows 100dpi Fonts " (OSFFONT15320)
Configuring "DECwindows 75dpi Fonts " (OSFFONT320)
Configuring "Adobe Fonts " (OSFDPSFONT320)
Configuring "Additional Networking Services " (OSFINET320)
Configuring "NFS(tm) Utilities " (OSFNFS320)
Configuring "Logical Storage Manager " (OSFLSMBASE320)
Configuring "POLYCTR advfs Kernel Objects " (OSFADVFSBIN320)
Configuring "Logical Storage Manager Kernel Objects" (OSFLSMBIN320)
Configuring "Common Agent " (OSFCOMAGENT320)

Configuring "GNU Emacs " (OSFEMACS320)
Configuring "Computer Aided System Tutor " (OSFLEARN320)
Configuring "Realtime Software Development " (OSFRTDEV320)
Configuring "C2-Security " (OSFC2SEC320)
Configuring "Dataless Management Services " (OSFDMS320)
Configuring "Obsolete Commands and Utilities " (OSFOBSOLETE320)
Configuring "C2-Security GUI " (OSFXC2SEC320)
Configuring "Logical Storage Manager GUI " (OSFLSMX11320)
Configuring "X Customizations for OEM " (OSFXOEM320)
Configuring "XIE Version 5 Online Documentation " (OSFXIEDOC320)
Configuring "Ref Pages: Windows Programming " (OSFMANWOP320)
Configuring "Ref Pages: Windows Admin/User " (OSFMANWOS320)
Configuring "Ref Pages: Programming " (OSFMANOP320)
Configuring "Ref Pages: Admin/User " (OSFMANOS320)
Configuring "Ref Pages: Realtime " (OSFMANRT320)

*** SYSTEM NAME SPECIFICATION ***

Select the name of your system using alphanumeric characters.
The first character must be a letter. For example, tinkerc.
Enter your system name: aruba

You selected 'aruba' as the name of your system.
Is this correct? (y/n) [y]: y

*** TIME ZONE SPECIFICATION ***

***** Main Timezone Menu *****

1) Australia	2) Brazil	3) CET	4) Canada
5) Chile	6) Cuba	7) EET	8) Egypt
9) Factory	10) GB-Eire	11) GMT	12) Greenwich
13) Hongkong	14) Iceland	15) Iran	16) Israel
17) Jamaica	18) Japan	19) Libya	20) MET
21) Mexico	22) NZ	23) NZ-CHAT	24) Navajo
25) PRC	26) Poland	27) ROC	28) ROK
29) Singapore	30) SystemV	31) Turkey	32) UCT
33) US	34) UTC	35) Universal	36) W-SU
37) WET	38) Zulu		

0) None of the above

Enter the selection number for each kernel option you want.
For example, 1 3 : 13

You selected the following kernel options:

Asynchronous Transfer Mode (ATM)
System V Devices
Logical Volume Manager (LVM)
Kernel Breakpoint Debugger (KDEBUG)
Packetfilter driver (PACKETFILTER)
STREAMS pkt module (PCKT)
Data Link Bridge (DLPI V2.0 Service Class 1)
X/Open Transport Interface (XTISO, TIMOD, TIRDWR)
File on File File System (FFM)
ISO 9660 Compact Disc File System (CDFS)
Audit Subsystem
Local Area Transport Support

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

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

The system will now automatically build a kernel
and then reboot. This will take approximately 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...Tue Jan 03 11:51:35 EDT 1995

Working...Tue Jan 03 11:53:36 EDT 1995

Working...Tue Jan 03 11:55:36 EDT 1995

Update Installation Log

The following is a sample of an update installation log. The number of files processed in an update installation can be greater than shown in this example and may take longer to process. A *Working...* message will be printed every two minutes to indicate that the update is proceeding. Do not use Ctrl/c to exit the installation unless you are certain that the installation has stalled for some reason.

Working...Thu Jan 5 15:16:59 EST 1995

The DEC OSF/1 V3.2 (Rev. 205) Update Installation will update the following DEC OSF/1 products:

DEC OSF/1 V3.0
DEC OSF/1 V3.0B

Digital Equipment Corporation recommends that you perform complete system software backups before proceeding.

The following layered products may require re-installation after the update installation has completed:

DEC Ada Runtime Library
Development Enhancements for OSF/1 AXP Systems (Rev 347)
DEC Cobol Run Time Support Library for OSF/1 AXP Systems

Press <RETURN> to review message again.

Do you want to continue the update installation? (y/n) []: y

***** Checking current state of system

Depending on the system configuration, this may take up to 20 minutes...

Working...Thu Jan 5 15:26:59 EST 1995
Working...Thu Jan 5 15:27:39 EST 1995
Working...Thu Jan 5 15:29:40 EST 1995
Working...Thu Jan 5 15:31:41 EST 1995
Working...Thu Jan 5 15:33:42 EST 1995
Working...Thu Jan 5 15:35:43 EST 1995
Working...Thu Jan 5 15:36:04 EST 1995

Unprotected customized system files have been found on this system and have been saved to 'filename.PreUPD'.

Basic X Environment
Copying from ds9 (inet)
Working...Thu Jan 5 15:49:01 EST 1995
Verifying

X Fonts
Copying from ds9 (inet)
Working...Thu Jan 5 15:50:27 EST 1995
Verifying

DECwindows 100dpi Fonts
Copying from ds9 (inet)
Working...Thu Jan 5 15:51:38 EST 1995
Verifying

DECwindows 75dpi Fonts
Copying from ds9 (inet)
Verifying

Adobe Fonts
Copying from ds9 (inet)
Verifying

Additional Networking Services
Copying from ds9 (inet)
Verifying

NFS(tm) Utilities
Copying from ds9 (inet)
Verifying

Logical Storage Manager
Copying from ds9 (inet)
Verifying

POLYCTR advfs Kernel Objects
Copying from ds9 (inet)
Verifying

Logical Storage Manager Kernel Objects
Copying from ds9 (inet)
Verifying

Local Printer Support
Copying from ds9 (inet)
Verifying

Adobe Font Metric Files
Copying from ds9 (inet)
Verifying

LSM Software Development
Copying from ds9 (inet)
Verifying

Local Area Transport (LAT)
Copying from ds9 (inet)
Verifying

POLYCTR advfs

Sample File Logs from Update Installations



J.1 List of Protected .new.. Files

```
./new...cshrc
./new...login
./new..DXsession
/etc/.new..TIMEZONE
/etc/.new..acucap
/etc/.new..autopush.conf
/etc/.new..binlog.conf
/etc/.new..disktab
/etc/.new..exports
/etc/.new..fstab
/etc/.new..ftputers
/etc/.new..gettydefs
/etc/.new..group
/etc/.new..hosts
/etc/.new..hosts.equiv
/etc/.new..inetd.conf
/etc/.new..inittab
/etc/.new..lprsetup.dat
/etc/.new..magic
/etc/.new..motd
/etc/.new..networks
/etc/.new..ntp.conf
/etc/.new..passwd
/etc/.new..phones
/etc/.new..profile
/etc/.new..protocols
/etc/.new..rc.config
/etc/.new..remote
/etc/.new..rpc
/etc/.new..securettys
/etc/.new..services
/etc/.new..setup.conf
/etc/.new..shells
/etc/.new..strsetup.conf
/etc/.new..svc.conf
/etc/.new..sysconfigtab
/etc/.new..syslog.conf
/etc/.new..ultrix_login
/etc/.new..ultrix_path
/etc/.new..ultrix_profile
/etc/auth/subsystems/.new..users
/etc/auth/system/.new..authorize
/etc/auth/system/.new..default
/etc/auth/system/.new..devassign
/etc/auth/system/.new..files
```

```
./usr/lib/X11/app-defaults/.new..XLoad
./usr/lib/X11/app-defaults/.new..XLogo
./usr/lib/X11/app-defaults/.new..XLogo-color
./usr/lib/X11/app-defaults/.new..XSysAdmin
./usr/lib/X11/app-defaults/.new..XTerm
./usr/lib/X11/app-defaults/.new..Xdefaults
./usr/lib/X11/app-defaults/.new..Xedit
./usr/lib/X11/app-defaults/.new..Xfd
./usr/lib/X11/app-defaults/.new..Xgc
./usr/lib/X11/app-defaults/.new..Xmag
./usr/lib/X11/app-defaults/.new..Xman
./usr/lib/X11/app-defaults/.new..Xmh
./usr/lib/X11/app-defaults/.new..dxcalendar_prolog.ps
./usr/lib/X11/config/.new..osfl.cf
./usr/lib/X11/config/.new..site.def
./usr/lib/X11/twm/.new..system.twmrc
./usr/share/lib/.new..Mail.rc
./usr/share/lib/.new..termcap
./usr/share/lib/kernel_options/.new..kernel_options.db
./usr/share/lib/terminfo/.new..dec.ti
./usr/shlib/.new..so_locations
./usr/sys/conf/.new..files
./usr/sys/conf/.new..param.c
./usr/sys/conf/alpha/.new..files
./usr/sys/io/common/.new..conf.c
./usr/sys/streams/.new..str_config.c
./usr/var/X11/.new..Xserver.conf
./usr/var/X11/fs/.new..config
./usr/var/X11/xdm/.new..GiveConsole
./usr/var/X11/xdm/.new..TakeConsole
./usr/var/X11/xdm/.new..Xaccess
./usr/var/X11/xdm/.new..Xkeymaps
./usr/var/X11/xdm/.new..Xresources
./usr/var/X11/xdm/.new..Xservers
./usr/var/X11/xdm/.new..Xservers.fs
./usr/var/X11/xdm/.new..Xsession
./usr/var/X11/xdm/.new..Xsetup_0
./usr/var/X11/xdm/.new..xdm-config
./usr/var/X11/xdm/.new..xdm-config.fs
./usr/var/adm/.new...login
./usr/var/adm/.new...profile
./usr/var/adm/.new..utmp
./usr/var/adm/.new..wtmp
./usr/var/adm/cron/.new...proto
./usr/var/adm/cron/.new..at.deny
./usr/var/adm/cron/.new..cron.deny
./usr/var/adm/cron/.new..log
./usr/var/adm/cron/.new..queuedefs
./usr/var/adm/sendmail/.new..aliases
./usr/var/adm/sendmail/.new..sendmail.cf
./usr/var/adm/sendmail/.new..sendmail.st
./usr/var/shlib/.new..so_locations
./usr/var/spool/cron/crontabs/.new..adm
./usr/var/spool/cron/crontabs/.new..root
./usr/var/spool/cron/crontabs/.new..sys
./usr/var/yp/.new..Makefile
./usr/var/yp/.new..ypxfr_1perday
./usr/var/yp/.new..ypxfr_1perhour
./usr/var/yp/.new..ypxfr_2perday
```

```
=====
= Files no longer shipped in OSFMANWOS
=====
./usr/share/man/.OSFMANWOS300.whatis
```

J.4 Sample Obsolete File List - Update from Version 3.0B to Version 3.2

```
=====
= Files no longer shipped in OSFBASE
=====
./sbin/rc3.d/S23kloadsrv
./sbin/init.d/kloadsrv
```

```
=====
= Files no longer shipped in OSFBINCOM
=====
./usr/sys/dli/dli_proto.c
```

```
=====
= Files no longer shipped in OSFHWBINCOM
=====
./usr/sys/include/arch/alpha/hal/ebv10.h
./usr/sys/include/arch/alpha/ebv10.h
```

```
=====
= Files no longer shipped in OSFINET
=====
./usr/lib/nls/msg/en_US.ISO8859-1/named.cat
```

```
=====
= Files no longer shipped in OSFLAT
=====
```

```
=====
= Files no longer shipped in OSFMANOP
=====
./usr/share/man/.OSFMANOP305.whatis
```

```
=====
= Files no longer shipped in OSFMANOS
=====
./usr/share/man/man5/XPG3.5
./usr/share/man/man5/SVID.5
./usr/share/man/man5/POSIX.5
./usr/share/man/.OSFMANOS305.whatis
```

```
=====
= Files no longer shipped in OSFMANRT
=====
./usr/share/man/.OSFMANRT305.whatis
```

```
=====
= Files no longer shipped in OSFMANWOP
=====
./usr/share/man/.OSFMANWOP305.whatis
```

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advanced developer's kit

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