DIGITAL UNIX

Documentation Overview

Part Number: AD-OC_OV-ER

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Product Version: DIGITAL UNIX Version 4.0D or higher

This manual describes the documentation for the DIGITAL UNIX operating system. It also describes the structure of the documentation kits and provides information about ordering them.

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About This Manual

This manual describes the documentation that comes with your DIGITAL UNIX operating system. It also provides information about the structure of the documentation kits and gives you information to help you order printed versions of the documentation.

Audience

This guide is for anyone who needs to access documentation about the DIGITAL UNIX operating system. It can help you decide which manuals in the documentation set are most useful to you and how you can use those manuals.

New and Changed Features

The *Documentation Overview* has been revised in the following ways for this release:

- The online version of this book has been reorganized and expanded to provide a more comprehensive view of the DIGITAL UNIX documentation set and other information of importance to users of the DIGITAL UNIX operating system.

  The *Glossary and Master Index* now exists as a separate book on line.

  A new printed version of the *Documentation Overview* will be offered with the next major release of DIGITAL UNIX; at that time, the *Glossary and Master Index* will also be updated and provided as a separate book in both online and printed versions.

  Note that because only the online version has been revised, variations exist between this version and the printed book.
- Descriptions have been added for new manuals and modified for existing manuals that have been updated since the last release of this overview .
- Information has been added about supplementary documentation that is included with the operating system but is not part of the core DIGITAL UNIX documentation set.
- Access to DIGITAL UNIX documentation on the World Wide Web is explained, as are other alternative sources of information.

Organization

This guide is divided into six chapters, as follows:

Chapter 1	Provides general information about the DIGITAL UNIX documentation set.
Chapter 2	Describes the DIGITAL UNIX documentation set, provides a description of each manual, and describes how the documentation is packaged.
Chapter 3	Describes documentation that supplements the DIGITAL UNIX documentation set. Some of these documents are produced by DIGITAL and others are produced by other organizations and provided by DIGITAL to help meet specific needs when working with the DIGITAL UNIX operating system.
Chapter 4	Describes the DIGITAL UNIX reference pages, shows the various ways of displaying the reference pages on line, and describes the contents of the Reference Pages Documentation Kit.
Chapter 5	Describes the Device Driver Kit and the contents of the books in that kit.
Chapter 6	Provides information on how to order DIGITAL UNIX printed documentation.

1

Finding the Documentation You Need

The DIGITAL UNIX documentation is provided on line and in printed formats, and is available from different sources. This chapter can help you to quickly find the documentation you need and in the format that is most convenient to you.

Note

If you already know the books you want, you can skip to Chapter 6 to find out the order numbers and information on how to place your order.

1.1 Defining the Documentation Set

The following list describes some of the terms used to categorize documentation that is provided with the operating system or used in conjunction with utilities and applications that run on the operating system:

- **Core documentation** consists of books that help you to use the DIGITAL UNIX operating system, including the components provided when you install all of the system's optional and mandatory subsets. Most of this documentation was created by writers who worked closely with the developers of the operating system to document the system's various components. The books that make up the core documentation are described in Chapter 2.

  On line, the DIGITAL UNIX reference pages are a component of the operating system and are available in optional subsets. They are also available in printed format in a 17–volume kit. For information about the reference pages, see Chapter 4. For information about ordering the printed documentation, see Chapter 6

  Documentation to aid program developers in writing device drivers for DIGITAL UNIX, was produced by DIGITAL writers working closely with DIGITAL UNIX engineers. Until recently , this documentation was included in the core documentation set, but it is now available as a separate documentation kit. For information about the device driver documentation, see Chapter 5. For information about ordering the Device Driver Kit, see Chapter 6

- **Supplementary documentation** tends to be less formal in structure than the core documentation. This category includes many different types of documents, such as Software Product Descriptions (SPDs), release notes for some components of the DIGITAL UNIX operating system, and industry reference material and white papers that come from DIGITAL engineers and other sources. Much of this documentation exists in PostScript format. For more information see Chapter 3.

- **Layered products documentation** consists of books and other documents that aid in the use of separately licensed products, such as DEC C++ and the TruCluster Software. For more information, see Section 1.6.

1.2 What You Get

The documentation that you receive from DIGITAL depends upon the purchase you make:

- If you purchase a DIGITAL UNIX media kit, you receive all of the online documentation, as well as printed versions of the Startup Documentation described in Chapter 2.
- If you purchase the DIGITAL UNIX Documentation Kit, you receive printed versions of the books described in Chapter 2.
- If you purchase an Update contract for the media, you receive the most current version of the Documentation CD–ROM, and a printed version of the *Release Notes*.
- If you purchase an Update contract for the documentation set, you receive printed versions of the books that have been updated. For Version 4.0D, this documentation consists of the following:
  - *Release Notes for Version 4.0D*
  - *System Configuration and Tuning*
  - *ULTRIX to DIGITAL UNIX Migration*
  - *Asynchronous Transfer Mode*
  - *Guide to DECthreads*
  - *DEC C Language Reference Manual*
  - *Documentation Map*

  For information about this documentation, see Chapter 2.
- If you purchase a system with the DIGITAL UNIX operating system preinstalled (often called a FIS system, for factory installed software), online versions of the *Release Notes*, *Installation Guide*, *System Administration*, *Network Administration*, and *Security* are installed on your system.

1.3 Available Formats

The manuals in the core documentation set are provided in online and printed formats.

1.3.1 Online Documentation

Most of the documentation, including the reference pages, is available on the DIGITAL UNIX Documentation CD–ROM in a format that is readable with a Web browser.

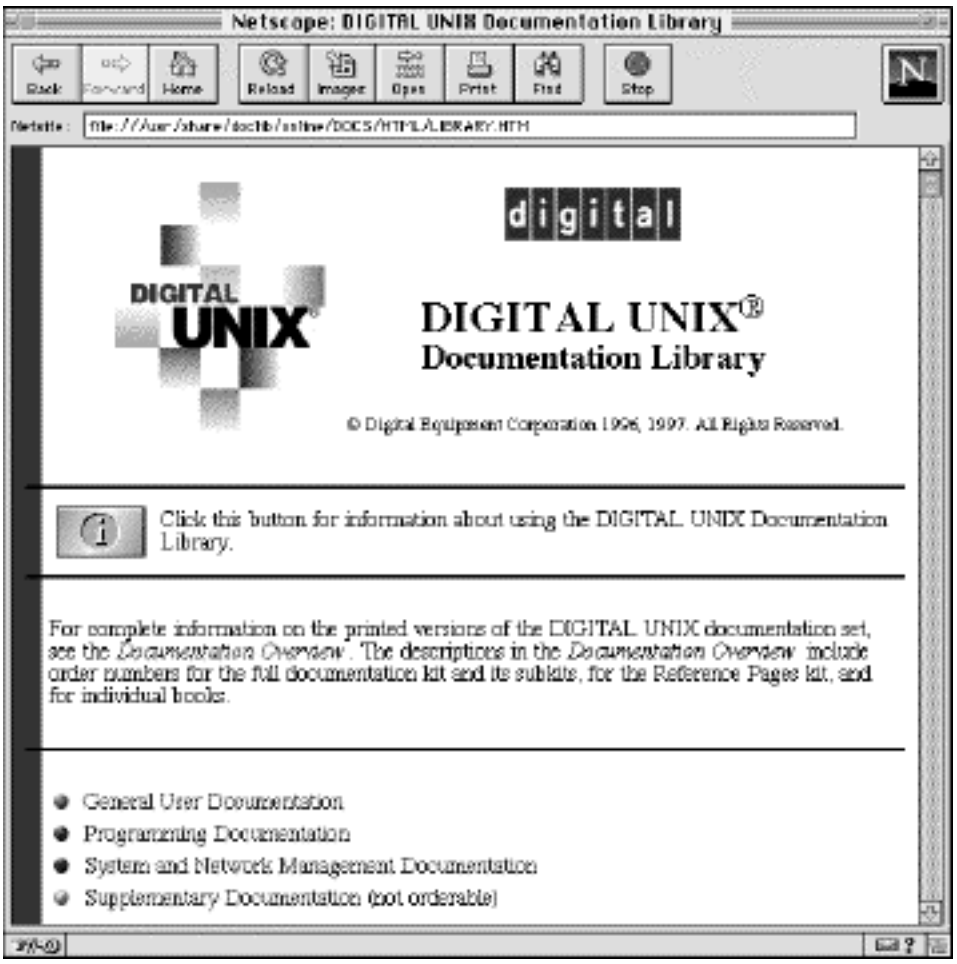
To read this HTML documentation using the Netscape browser included with the DIGITAL UNIX operating system, launch the `netscape` software from the CDE Applications panel. Then choose the documentation link on the DIGITAL UNIX home page.

For help using the `netscape` software, pull down the Help menu from the `netscape` menu bar.

The online Documentation Library generally follows the structure of the printed documentation kits. However, because some manuals are used by different audiences, those manuals may reside on several of the online bookshelves. For example, the *Release Notes* are important to everyone using the operating system and are therefore included on each bookshelf. Another example is the *Security* manual, which provides information useful to the general user, system administrator, and software developer.

Figure 1–1 shows the structure of the online Documentation Library's top level.

Figure 1–1: Online Documentation Library



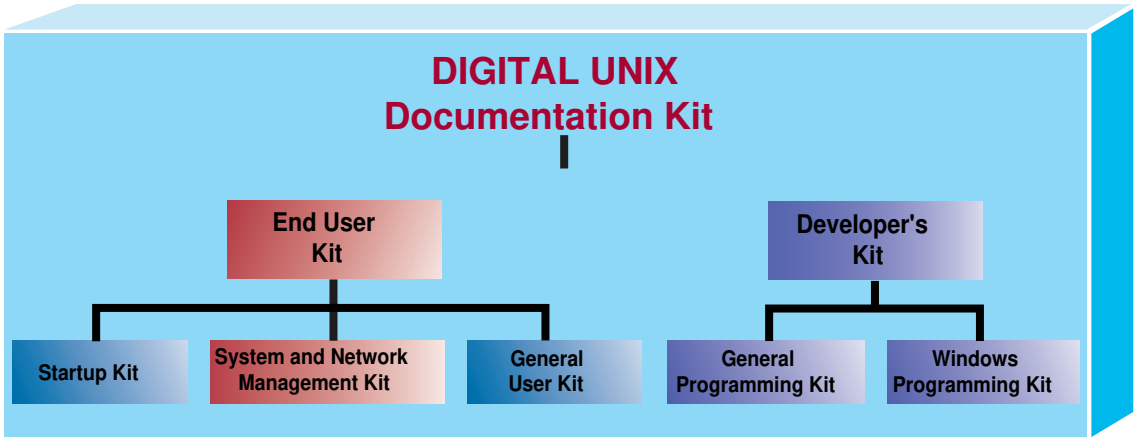
Much of the DIGITAL UNIX documentation is also available on the World Wide Web. See Section 1.5.

1.3.2 Printed Documentation

When you purchase a DIGITAL UNIX media kit, you receive printed versions of a small number of manuals to help you install and begin using the operating system. To receive printed versions of the rest of the core documentation, you must order a DIGITAL UNIX Documentation Kit or one of its subkits, as described in Chapter 2. A small number of manuals can be individually purchased. (See Chapter 6 for information about ordering documentation.)

Figure 1–2 shows the struture of the DIGITAL UNIX Documentation Kit. A discussion of that structure follows.

Figure 1–2: Structure of the DIGITAL UNIX Documentation Kit



- End User Documentation Kit

  This kit contains all the information needed to install and use the DIGITAL UNIX system. This kit is divided into three subkits as follows:

  – Startup Documentation Kit

    This kit is primarily for the person who installs the DIGITAL UNIX operating system. It contains information on how to configure software components and some information (such as the *Release Notes*) needed by all DIGITAL UNIX users.

    When you order the DIGITAL UNIX operating system, the books in the Startup Documentation Kit are packaged with the distribution media.

  – System and Network Management Documentation Kit

    This kit is for people who are responsible for managing the DIGITAL UNIX operating system or network. The manuals in this kit provide information on how to configure, manage, and tune DIGITAL UNIX systems.

  – General User Documentation Kit

    This kit provides general information on how to use the DIGITAL UNIX operating system. The manuals in this kit are for everyone who uses DIGITAL UNIX.

- Developer's Documentation Kit

  This kit is for software developers who write programs on or for the DIGITAL UNIX operating system. The books in this kit include information on tools and programming recommendations.

  This kit is divided into the following subkits:

  – General Programming Documentation Kit

    This kit provides information of interest to most programmers who write applications that run on the DIGITAL UNIX operating system. Manuals in this kit describe using the programming tools and interfaces.

  – Windows Programming Documentation Kit

    This kit provides information for programmers who are creating a window interface to an application, including the Common Desktop Environment (CDE), OSF/Motif, and the X Window System.

  When you order printed manuals, you will notice that the books are color coded and include an icon on the spine to help you quickly find the book you are looking for on your bookshelf. The following list describes this convention:

Audience	Icon	Color Code
General users	G	Blue
System and network administrators	S	Red
Programmers	P	Purple

Some books in the documentation set help meet the needs of several audiences. For example, a general user might want to use the manual *Programming Support Tools* to get advanced information about using commands such as `grep` or `awk`. Also, information in some system books is also used by programmers. Keep this in mind when searching for information on specific topics.

1.4 The Documentation CD–ROM

With this release of DIGITAL UNIX, you can view the DIGITAL UNIX documentation on a PC or Macintosh – laptop or workstation – or on any other system that uses the ISO 9660 Level 1 CD–ROM standard.

The CD–ROM's HTML library provides links to the HTML and PostScript documents. By configuring your brower's preferences, you can view some or all of these formats by clicking on the link in the library . For example, you can configure your system to start a PostScript viewer when you select a document in PostScript format.

This CD–ROM also contains the complete set of DIGITAL UNIX reference pages for browsing with the `webman` viewer. The files in this area are usable only on UNIX systems that support the Rock Ridge Extensions to the ISO 9660 standard. (For information about installing and using `webman`, see the file */mnt-point*`/DOCS/HTML/webman/Installing-webman.txt` on the Documentation CD–ROM.)

To mount the Documentation CD–ROM on DIGITAL UNIX systems, PCs, and Macintosh computers, see the inside panels of the Documentation CD–ROM's jacket. The DIGITAL UNIX *Installation Guide* provides information about mounting CD–ROM on DIGITAL UNIX systems.

1.5 DIGITAL UNIX Documentation on the World Wide Web

You can find most of the DIGITAL UNIX manuals in the core documentation, as well as some other useful documentation, through DIGITAL's homepage on the World Wide Web.

The documentation available for viewing at this site includes the DIGITAL UNIX manuals that are in HTML format, the TruCluster Software documentation, the Device Driver documentation, and documentation for the Advanced File System Utilities.

Additionally , that online library includes the reference pages for the DIGITAL UNIX operating system, the Common Desktop Environment graphical interface, and the TruCluster Software products.

To view this documentation, point your Web browser to the following URL:

`http://www.unix.digital.com/faqs/publications/pub_page/pubs_page.html`

1.6 Documentation for Layered Applications

DIGITAL and third-party vendors produce many applications that run on DIGITAL UNIX systems. The documentation for most of these products is

included with the individual application software. The following sections provide some guidance.

1.6.1 Associated Products Volume 2 CD–ROM

The software for several separately licensed products is provided on the CD–ROM labeled Associated Products Volume 2, which is included in the DIGITAL UNIX media kit. These products include the TruCluster Software products, the Advanced File System Utilities, the System V Environment, and the Advanced Server for DIGITAL UNIX.

Included with this software are online versions of the documentation for installing and using the applications. You do not need a separate software license to view this documentation, which is usually provided in both HTML and PostScript formats. For information about viewing this documentation, see Section 3.3.

Printed versions of the documentation on the Associated Products Volume 2 CD–ROM are included with the license when you purchase the product from DIGITAL.

1.6.2 Consolidated Software CD–ROM

Many of the layered applications produced by DIGITAL, such as DEC C++ and the Distributed Computed Environment (DCE), are included on the DIGITAL UNIX Alpha Consolidated Software Distribution CD–ROM. Documentation for these products is included on the companion Software Product Library disk. These are separately orderable products and are not included with the DIGITAL UNIX media kit. For information about ordering these CD–ROMs, contact DIGITAL (see Chapter 6) or talk with your DIGITAL sales representative.

1.6.3 Device Driver Documentation

Documentation for programmers who create device driver software for the DIGITAL UNIX operating system is available as a separately orderable kit. See Chapter 5 for more information about the Device Driver Documentation kit.

2

The DIGITAL UNIX Manuals

This chapter provides brief descriptions of the core documentation. For convenience, it is divided into sections that follow the structure of the printed documentation kits. See Section 1.3.1 for information about the online Documentation Library structure.

2.1 End User Documentation

Manuals for the end user contain the information you need to install and configure a DIGITAL UNIX system, bring it up on a network, and use it. The documentation in this category is grouped in three primary areas: startup documentation, general user documenation, and system and network management documentation.

2.1.1 Startup Documentation

The startup documentation is packaged in printed form with your DIGITAL UNIX media. It consists of the documents you need to install, configure, and begin using your system.

Release Notes for Version 4.0D

The *Release Notes for Version 4.0D* are for all users of the DIGITAL UNIX operating system. This book includes the following information:

- An overview of the new and changed features of the Version 4.0D software
- Announcements about features and interfaces that are scheduled for removal in future versions of DIGITAL UNIX
- Information about installing the software
- Information that is relevant to specific DIGITAL Alpha processors
- Information about the base operating system
- Information about the development environment
- Information about the graphical interfaces
- Additions and corrections to the books in the DIGITAL UNIX documentation set

DIGITAL recommends that you read the *Release Notes* before installing or using the DIGITAL UNIX operating system.

Installation Guide

This manual describes the procedures for performing an update installation, a basic installation, or an advanced installation of the DIGITAL UNIX product on all supported processors. It also discusses system management procedures in a standalone environment.

Update Installation Quick Reference Card (Available only in printed form)

This foldout card provides easy access to the information needed to upgrade a DIGITAL UNIX system to the next version. Update installations preserve disk partitions, file systems, and file customizations.

The information on this card is covered in detail in Chapter 2 of the *Installation Guide*.

Technical Overview

This manual provides a technical overview of the DIGITAL UNIX operating system, focusing on the networking subsystem, the file system, virtual memory , and the development environment. In addition, the manual lists all system limits.

Documentation Overview, Glossary, and Master Index

You are reading the online version of the *Documentation Overview*. The *Glossary and Master Index* are also available on line. For more information, see the New and Changed Features section in the preface.

The printed version of this manual has three parts:

- Part 1 describes the books in the DIGITAL UNIX documentation set.
- Part 2 provides a glossary of DIGITAL UNIX terms.
- Part 3 provides a master index for the DIGITAL UNIX documentation set. The index entries are designed to help users determine which book references information on a particular topic.

Note

The Master Index was not revised for this release. Therefore, some of the entries for books that were revised since the Version 4.0 release may be inaccurate in both the printed and online versions.

Quick Reference Card (Available only in printed form)

This foldout card provides fingertip access to the format of common user commands, such as `cd`, `chmod`, `lpr`, and `man`. The card also describes flags that are commonly used with each command.

Additionally , this card provides command summaries for the `vi`, `emacs`, `Mail`, and `mail` applications, and it summarizes the rules for forming regular expressions. It provides a description of command control symbols (such as |, the pipe symbol) and gives definitions of shell environment variables and metacharacters.

Documentation Map (Available only in printed form)

This poster illustrates the core DIGITAL UNIX documentation, as well as information about the reference pages and device driver documentation. With it, you can tell at a glance which books in the documentation set are of interest to you and how you can find them.

2.1.2 General User Documentation

General user documentation contains important information for all users of the DIGITAL UNIX operating system. The books in this category provide introductory information for people who are unfamiliar with DIGITAL UNIX:

CDE Companion

This manual provides an introduction to DIGITAL's implementation of the Common Desktop Environment (CDE), an easy method of interacting with the the DIGITAL UNIX operating system.

For users migrating from DECwindows Motif to CDE, this book serves as an introduction to the new environment, providing information on how to use CDE to complete tasks previously done by using DECwindows.

For users who are new to desktop environments, this book provdes quick-start information on topics such as logging into the system, navigating the system, and using and managing the desktop and applications.

This book can be used in conjunction with the *Common Desktop Environment: User's Guide*.

Command and Shell User's Guide

This manual introduces the basic features of the DIGITAL UNIX operating system. It describes how to use the command line interface and to perform such tasks as copying files and creating directories. It also describes how to use the shells and their built-in commands.

Although this manual is primarily for users who have little or no familiarity with UNIX-compatible systems, experienced users can find useful shortcuts and tips.

Common Desktop Environment: Advanced User's and System Administrator's Guide

This manual describes how to customize the appearance and behavior of CDE. It provides information on topics such as the following:

- Customizing system initialization, login, and session initiation
- Adding applications and providing interface representations for applications and their data
- Configuring desktop processes, applications, and data across the network
- Customizing desktop services such as window management, printing, colors, and fonts

This book is intended for users who want to perform customizations that cannot be accomplished using the desktop user interface. This book is also intended for system administrators; many of the tasks in this book require superuser permission.

Common Desktop Environment: User's Guide

This manual describes the basic features of the CDE and describes how to use the desktop and the desktop applications. It expands upon some of the topics in the *CDE Companion* and provides figures of the graphical interface as it is displayed on workstation screens.

DECwindows User's Guide

This manual describes how to log on to a DIGITAL UNIX workstation and begin working with the DECwindows Motif interface. It also explains how to customize the DECwindows environment, how to use advanced features of Mail, and how to use AccessX software.

This manual is primarily for users who have little or no familiarity with computers or those with little knowledge of UNIX-compatible systems. Advanced

users might refer to this manual for its description of desktop applications, such as `dxdiff`, and for topics such as using keyboard shortcuts with DECwindows.

Security

This manual provides information needed by users and system administrators who are working on DIGITAL UNIX systems that have the optional enhanced security subsets installed. It also provides information needed by developers who are writing programs that will run on secure systems. The enhanced security features help protect systems or data from access by unauthorized users.

This manual also provides information about security on systems that do not have the enhanced security subsets installed.

The information is organized as follows:

- Part 1 describes how to use the DIGITAL UNIX operating system with enhanced security from the command line.
- Part 2 describes how to administer the operating system's enhanced security , which includes enhanced passwords and the audit subsystem. The Security Integration Architecture (SIA) is also discussed. This part of the manual assumes prior knowledge and experience administering secure systems.
- Part 3 describes how to write programs that run on the DIGITAL UNIX operating system with enhanced security . This part assumes general programming knowledge, including knowing how to use DIGITAL UNIX programming tools.

2.1.3 System and Network Management Documentation

System and network management documentation provides information on topics such as configuring systems and networks, maintaining disks, and using system administration tools.

DECevent Translation and Reporting Utility

DECevent provides an interface between a system user and the operating system's event logger. DECevent can help system administrators to troubleshoot DIGITAL UNIX system problems.

This manual describes the DECevent command features related to the translation and reporting of events on DIGITAL UNIX operating systems. It contains an overview of the utility , information on how to obtain help for the utility , and information about all the commands necessary to translate event logs on DIGITAL UNIX operating systems.

Guide to Prestoserve

Prestoserve speeds up synchronous disk writes, including NFS server access, by reducing the amount of disk I/O.

This manual describes how to to manage and maintain a DIGITAL UNIX system that includes the optional Prestoserve hardware and software.

Kernel Debugging

The manual describes using the `dbx`, `kdbx`, and `kdebug` debuggers to find problems in kernel code. It also describes how to write a `kdbx` utility extension and how to create and analyze a crash dump file.

This manual is for system administrators responsible for modifying, rebuilding, and debugging the kernel configuration. It is also for system programmers who need to debug their kernel-space programs.

Logical Storage Manager

The Logical Storage Manager (LSM) provides help to more effectively manage disk resources, gain high data availability , and increase I/O performance. It provides the ability to divide disks into subdisks, concatenate disks, stripe data across disks, and mirror data for duplication of data.

This manual provides system administrators with a thorough knowledge of LSM concepts and procedures involved with disk and volume management. It also describes in detail the three LSM interfaces used to perform LSM disk management operations: the graphical-user interface (`dxlsm`), the character-cell menu interface (`voldiskadm`), and the command line interface.

Network Administration

This manual provides information on establishing a DIGITAL UNIX system on a network and configuring network software such as NFS and BIND. It also explains how to manage a network and network applications and how to solve problems that might arise.

This manual is for experienced system and network administrators who have knowledge of TCP/IP networking concepts and network configuration. Readers should also have knowledge of operating system concepts, commands, and configuration.

Performance Manager

POLYCENTER Performance Manager is a real-time peformance manager that allows system administrators to detect and correct performance problems in DIGITAL UNIX sytems. The three primary components of the Performance Manager are a graphical user interace, the Performance Manager daemon, and an activity daemon. An additional daemon monitors systems running the TruCluster Software.

This manual explains the concepts of the Performance Manager software, and describes tasks such as monitoring, thresholding, archiving, and distributed command execution.

Software License Management

This manual describes how to use the License Management Facility (LMF) to manage software licenses from Digital Equipment Corporation.

Although intended primarily for system administrators responsible for managing software licenses on DIGITAL UNIX systems, this manual also provides information for anyone who uses licensed software on DIGITAL UNIX systems.

System Administration

This manual describes how to configure, use, and maintain the DIGITAL UNIX operating system. It includes information on general day-to-day activities and tasks, changing system configurations, and locating and eliminating sources of trouble.

This manual is for system administrators responsible for managing the operating system. It assumes a knowledge of operating system concepts, commands, and configurations.

Sharing Software on a Local Area Network

This manual describes Remote Installation Services (RIS) and Dataless Management Services (DMS). The RIS utility is used for installing software across a network, instead of using locally mounted media. DMS allows a server system to maintain the root, `/usr`, and `/var` file systems for client systems. Each client system has its own root file system on the server, but clients share the `/usr` and `/var` file systems.

System Configuration and Tuning

This manual describes how to set up and tune high-performance and high-availability systems running the DIGITAL UNIX operating system. It can help system administrators to accomplish many system tasks, including the following:

- Determine the needs of the environment
- Configure and tune a system that will meet current and future needs
- Understand how hardware, operating system subsystems, and layered applications interact to affect system performance
- Learn recommended ways to improve performance

This manual replaces the *System Tuning and Performace Management* manual.

ULTRIX to DIGITAL UNIX Migration

This manual describes how to upgrade a system from an ULTRIX and ULTRIX Worksystem Software system to DIGITAL UNIX, focusing on the following migration paths:

- From ULTRIX Versions 4.2 through 4.4 to DIGITAL UNIX Versions 3.0 through 3.2
- From ULTRIX Version 4.5 to DIGITAL UNIX Version 4.0B.

This manual provides answers to migration issues for ULTRIX users, system and network administrators, and programmers.

X Window System Administrator's Guide (Available only in printed form)

This manual, published by O'Reilly & Associates, describes how to customize a wide range of X Window System environments, from an individual workstation to groups of workstations and X terminals connected on a network. Major topics include security , the X display manager (`xdm`), fonts, color, X terminals, and X client applications.

X Window System Environment

This manual describes various aspects of the X Window System environment as it is implemented on DIGITAL UNIX. It provides information on how to perform system administration tasks for the DIGITAL UNIX X Window System environment, and describes how to customize X Window System resources and key mappings. It also provides information about programming within the DIGITAL UNIX X Window System environment.

2.2 Documentation for Program Developers

The programming documentation consists of manuals designed for software developers who write software applications on or for the DIGITAL UNIX

operating system. The documentation in this category is grouped in two primary areas: general programming and windows programming.

2.2.1 General Programming Documentation

The manuals in the general programming category describe the DIGITAL UNIX programming environment.

Asynchronous Transfer Mode

This manual describes the DIGITAL UNIX Asynchronous Transfer Mode (ATM) subsystem, how to configure the subsystem, and how to use the ATM kernel interfaces.

This manual is for experienced UNIX kernel programmers responsible for writing ATM device drivers and kernel modules.

Assembly Language Programmer's Guide

This manual describes the Alpha hardware architecture's assembly language, which is supported by the DIGITAL UNIX compiler system. The manual describes the assembly language syntax rules, and how to write assembly language programs.

This manual is for system software developers who are writing assembly language programs on or for DIGITAL UNIX.

DIGITAL UNIX Calling Standard for Alpha Systems

This manual defines the requirements, mechanisms, and conventions used in the interface that supports procedure calls on DIGITAL UNIX for Alpha systems. The standard defines data structures, constants, algorithms, conventions, methods, and functional interfaces, which enable a native, user-mode procedure to operate correctly in the multilanguage and multithreaded DIGITAL UNIX environment on Alpha hardware.

Although this manual primarily defines requirements for compiler and debugger writers, the information applies to procedure calling for all programmers at all levels of programming.

DEC C Language Reference Manual

This manual provides reference information for using the DEC C language on DIGITAL systems. DEC C is an ISO/ANSI-compliant C compiler for DIGITAL UNIX and OpenVMS VAX and Alpha systems.

This manual is based on the ISO C Standard (ISO 9899:1990[1992]), formerly the ANSI X3J11 committee's standard for the C programming language (commonly called ANSI C). All library functions and language extensions to the ANSI C standard are also described.

This manual is intended for programmers who need reference information on the DEC C language. For task-oriented information or platform-specific information see the `cc`(1) reference page and the *Programmer's Guide*.

DIGITAL Portable Mathematics Library

This manual provides reference and exception information for DPML, DIGITAL's Portable Mathematics Library software. This manual documents the DPML

routines and, in particular, how they behave when given an exception input argument. It also documents operating system entry points and supported floating-point data types.

This manual is for compiler writers and system and application programmers who do not have high-level language support of DPML routines in their language of choice, but instead need to access DPML routines directly from application programs.

Ladebug Debugger Manual

The DIGITAL Ladebug Debugger is a tool for debugging executable programs at the source-code and machine-code levels. It can debug programs written in C and C++, Ada, COBOL, and Fortran.

This manual is for developers who need to debug multiprocess and multithreaded applications, perform kernel debugging, and perform remote client/server debugging. It is organized in two parts:

- Part 1 describes the Ladebug graphical (window-based) user interface (GUI), which provides access to all of the major Ladebug features.
- Part 2 describes the command line interface, which can be used from within the GUI or from the shell-level prompt.

Guide to DECthreads

This manual provides usage and reference information on DECthreads routines. It provides information on the three DECthreads interfaces used to perform multithreaded operations: cma, pthread, and pthread exception-returning.

This manual is for programmers writing multithreaded applications. It assumes experience with a high-level programming language (such as C), with UNIX operating systems, and with UNIX software development tools.

Guide to Preparing Product Kits

This manual describes the procedures for creating, maintaining, and installing the collections of files and directories that make up a layered products kit. A kit is the standard mechanism by which layered product modifications are delivered and maintained on a DIGITAL UNIX system. Kits are distributed on CD–ROM, diskettes, or tape for installation on customer's systems.

Guide to Realtime Programming

This manual is for programmers who are developing realtime applications on DIGITAL UNIX systems. It provides information on writing new realtime applications and porting existing realtime applications from other systems.

This manual does not present function syntax or reference information; the online reference pages provide that information.

This manual is for application programmers or system engineers who are already familiar with the C programming language. It assumes experience with UNIX operating systems and with UNIX software development tools.

Network Programmer's Guide

This manual describes the DIGITAL UNIX network programming environment. It describes in depth the X/Open Transport Interface (XTI) and the sockets and STREAMS programming frameworks, including information about system calls,

header files, and libraries. Additionally , it provides information about porting sockets-based applications to XTI.

This manual also describes the software bridge `ifnet` (STREAMS module and DLPI STREAMS pseudodevice driver) that the DIGITAL UNIX operating system supports. This bridge allows programs that use sockets-based protocol stacks to access STREAMS drivers, and programs that use STREAMS-based protocol stacks to access BSD-based drivers.

This manual is for experienced UNIX programmers.

Programmer's Guide

This manual describes the programming environment of the DIGITAL UNIX operating system, with an emphasis on the C programming language.

This manual is for all programmers who use the DIGITAL UNIX operating system to create or maintain programs in any supported language.

Programmer's Guide: STREAMS (Available only in printed form)

This manual (developed by AT&T and published by Prentice-Hall) provides information on the use of the STREAMS mechanism at the user and kernel levels. It contains introductory information for those who are unfamiliar with the STREAMS mechanism.

This manual addresses topics such as using STREAMS to monitor, control, and poll Streams; designing and implementing STREAMS modules and drivers; and using STREAMS-based pipes and FIFOs. It also describes the STREAMS multiplexing facility and the STREAMS-based terminal and pseudo-terminal subsystems.

Programming Support Tools

This manual describes commands and utilities for text manipulation, macro and program generation, and source file management on DIGITAL UNIX.

Although the commands and utilities described in this manual are primarily for programmers, some of them (such as `grep`, `awk`, `sed`, and the Source Code Control System (SCCS)) are useful for general users.

This manual assumes that the reader is a moderately experienced user of UNIX systems.

Programming with ONC RPC

This manual provides an overview of high-level programming with remote procedure calls in the Open-Network Computing Environment (ONC RPC). It describes how to use the `rpcgen` protocol compiler to create RPC applications and describes the RPC programming interface.

This manual is for programmers who want to write network applications without knowledge of the underlying network.

Writing Software for the International Market

This manual provides an overview of writing international programs and provides details about using the tools included on the DIGITAL UNIX operating system.

An international program interacts with users in their own language and reflects the culture of the users' region. Internationalization is the process of designing or

adapting programs to meet international requirements, such as those of multiple local languages and the specific character sets associated with them.

This manual is for programmers developing international applications for DIGITAL UNIX.

2.2.2 Windows Programming Documentation

Windows programming documentation contains information specifically for programmers developing Common Desktop Environment (CDE) applications or X window applications on or for DIGITAL UNIX. This kit contains the following manuals:

Common Desktop Environment: Application Builder User's Guide

This manual introduces the Application Builder and explains how to use it to build CDE applications. Because the Application Builder helps to easily create and modify user interfaces, it is a powerful tool for programmers, user interface designers, and project managers.

Common Desktop Environment: Desktop KornShell User's Guide

This manual provides the information needed to create Motif applications with Korn Shell (`ksh`) scripts. It also provides several example scripts of increasing complexity .

This manual is for programmers who want to develop Motif applications using Korn Shell scripts rather than the C programming language. This manual assumes knowledge of Korn Shell programming, Motif, and the Xt Intrinsics. Familiarity with the X programming library (`Xlib`) is also assumed.

Common Desktop Environment: Help System Author's and Programmer's Guide

This manual describes how to develop online help for CDE applications. It describes how to create help topics and how to integrate online help into a CDE application.

This manual is for application programmers who want to do the following:

- Design, create, and view online help information
- Create software applications that provide a fully integrated help facility

Common Desktop Environment: Internationalization Programmer's Guide

This manual provides information for internationalizing the desktop and enabling applications to support various languages and cultural conventions in a consistent user interface.

This manual is for CDE application programmers whose products are available worldwide.

Common Desktop Environment: Programmer's Guide

This manual contains the information needed to integrate an existing application into the CDE desktop. It also describes how to write new CDE applications.

This manual assumes a familiarity with Motif, X, UNIX, and C programming.

Common Desktop Environment: Programmer's Overview

This manual provides a high-level view of the development environment and the developer documentation set for CDE. It is for the following audiences:

- Application developers who develop new CDE applications, or integrate existing OSF/Motif applications into CDE
- Managers or project leaders interested in designing a project involving applications that will run on CDE

Common Desktop Environment: Style Guide and Certification Checklist

This manual provides style guidelines for CDE application design and lists the requirements for CDE application-level certification. CDE requirements consist of the OSF/Motif Version 1.2 requirements with CDE-specific additions.

Common Desktop Environment: ToolTalk Messaging Overview

This manual describes how the ToolTalk service works and how it uses information that applications supply to deliver messages. It also describes how applications use the ToolTalk service and ToolTalk components.

This manual assumes familiarity with the ToolTalk service, UNIX operating system commands, system administrator commands, and system terminology .

Common Desktop Environment: Product Glossary

This glossary provides a comprehensive list of terms used in the Common Desktop Environment.

This manual is for all CDE users.

Developing Applications for the Display PostScript System

This manual introduces the Display PostScript system extensions of DIGITAL's windowing software. The manual describes specific concepts, tasks, and facts that programmers must know to write Display PostScript applications for windowing software.

This manual is for experienced UNIX programmers. It assumes a familiarity with the C programming language and the PostScript programming language. This manual is meant to be used in conjunction with the *PostScript Language Reference Manual*.

OSF/Motif Programmer's Guide (Available in printed form only)

This manual (developed by the OSF and published by Prentice Hall) provides programming information on how to use the various components of the OSF/Motif environment: the Toolkit, window manager, and user interface language.

This manual is for programmers who want to create applications in the OSF/Motif environment.

OSF/Motif Style Guide (Available in printed form only)

This manual (developed by the OSF and published by Prentice Hall) provides a framework of behavior specifications to guide application developers, widget developers, and window manager developers in the design and implementation of products consistent with the Presentation Manager and the OSF/Motif user interface.

This manual establishes consistent behavior among new products by drawing out common elements from a variety of current behavioral models. It anticipates the evolution of graphical user interfaces as new technology becomes available and as the use of the OSF/Motif user interface spreads.

This manual is for programmers and interface designers developing OSF/Motif applications who want to present a uniform and usable software interface consistent with other OSF/Motif applications.

PostScript Language Reference Manual (Available in printed form only)

This manual (published by Addison-Wesley) provides the reference for the syntax and semantics of standard PostScript language, the associated imaging model, and the effects of the graphical operators.

This manual is for programmers writing applications that generate PostScript page descriptions.

From time to time, Adobe System, Inc., publishes supplements to its documentation. The latest set of supplements is included on the DIGITAL UNIX distribution kit. See Chapter 3 for information about printing copies of the supplements.

3

Supplementary Documentation

To help meet specific needs when working with the DIGITAL UNIX operating system, DIGITAL makes available documentation that supplements the DIGITAL UNIX documentation set. Some of these documents are produced by DIGITAL and others are produced by other organizations and provided by DIGITAL.

The Documentation CD–ROM, Operating System CD–ROM, Associated Products CD–ROMs volumes 1 and 2 all contain supplementary documentation. Much of this documentation pertains to individual components.

For example, the Associated Products Volume 1 CD–ROM contains installation guides for the Multimedia Services for DIGITAL UNIX run-time environment, DECevent, and the DIGITAL Porting Assistant. Other component-specific information includes release notes, Software Product Descriptions (SPD), and user information.

This *Documentation Overview* does not list all of the supplementary documentation on the CD-ROMs, but it does provide some guidance in the following sections.

3.1 Documentation CD–ROM

You can access the HTML documentation described in this section by clicking on the bookshelf called *Supplementary Documentation* on the Documentation CD–ROM. The files for these books are located in the `/DOCS/HTML` directory .

If your system is configured to recognize PostScript files and open them in a PostScript viewer, you can click on them in the bookshelf called *PostScript versions of additional books* under the *Supplementary Documentation* bookshelf. The individual PostScript files are located on the `DOCS/PSCR` directory .

The following sections describe the supplementary documentation on the Documentation CD–ROM. Included with each description of a PostScript document is the name of the file that contains the document. For example, the book *DECwindows Extensions to Motif* is contained in the file called `AQ8YSATE.PS`.

3.1.1 CD–ROM Contents Listing

This is an online version of the document called *DIGITAL UNIX Version 4.0D CD–ROMs*, which is included in the DIGITAL UNIX media kit. It provides brief listings of the components on the CD–ROMs in the media kit.

3.1.2 *Documentation Overview*

The revised version of the *Documentation Overview* (the book you are reading) is available in PostScript format. The file is named `DOC_OVER.PS`.

3.1.3 *DIGITAL UNIX Year 2000 Readiness*

The *DIGITAL UNIX Year 2000 Readiness* document contains information about the DIGITAL UNIX Year 2000 program to help you prepare your system for the

turn of the century . It also includes other important Year 2000 information on previous DIGITAL UNIX versions and layered products, and describes testing methodologies and guidelines.

Included in this document are links to related Web sites.

3.1.4 Java Documentation

Beginning with the Version 4.0D release, the DIGITAL UNIX operating system includes a Java Development Kit (JDK), which provides tools to develop and run Java applets and programs on the DIGITAL UNIX operating system.

Access to the Java documentation depends upon whether the Java Development Kit is installed on your system and how your system administrator has set up your system. Clicking on *Java Overview* on the Supplementary Documentation bookshelf takes you to a page that provides information about viewing the Java documentation. This page also provides a Web link to the JavaSoft JDK documentation at the Sun Microsystems Java site.

3.1.5 DECwindows Documentation

The books in this section are designed to aid programmers who are creating or modifying applications that use the DECwindows graphical user interface. These books are in PostScript format. The names of the individual files are listed after the titles.

- *DECwindows Companion to the OSF/Motif Style Guide* (AQ8YSATE.PS)

  This manual provides supplemental information to the *OSF/Motif Style Guide*. It contains more detailed explanations and illustrations for application developers to help them create consistent user interfaces for their applications.

- *DECwindows Motif Guide to Application Programming* (AQ8YTATE.PS)

  This manual describes the DECwindows Motif Toolkit and how to use it to design a DECwindows application interface. In particular, it describes the programming interface for widgets that DIGITAL provides in the Toolkit.

- *DECwindows Extensions to Motif* (AQ8YUATE.PS)

  This manual describes the programming extensions that DIGITAL provides to supplement the X Window System, Version 11, Release 5, and OSF/Motif Toolkit components included in systems based on the UNIX environment.

  This manual supplements the *OSF/Motif Programmer's Guide* and the X Window System documentation described in Section 3.1.6.

3.1.6 Documentation for the X Window System

The documentation described in this section pertains to X Windows System, Version 11, Release 6. These documents, provided by the X Consortium, are in PostScript format. The names of the individual files are listed after the titles. (The indexes for these documents are provided in separate files. The index files have the same names as the books, with the characters "_IX" appended to them; for example, the index for the *X Window System Protocol* is PROTO_IX.PS.)

- *X Window System Protocol* (PROTO.PS)

  This document describes the X Window System protocol.

- *Inter-Client Communication Conventions Manual* (ICCCM.PS)

  This document proposes suitable conventions for interclient communications with X Version 11 software. The proposed conventions do not attempt to enforce any particular user interface.

- *X Toolkit Intrinsics — C Language Interface* (INTRINSC.PS)

  Intrinsics are a programming library tailored to the specical requirements of user-interface construction within a network window system — specifically the X Window System. The Intrinsics and a widget set make up the X Toolkit. This document describes the X Toolkit Intrinsics.

- *X Logical Font Description Conventions* (XLFD.PS)

  This document provides a standard logical font description and the conventions to be used in the core protocol so that clients can query and access screen type libraries in a consistent manner across all X servers.

- *Xlib — C Language X Interface* (XLIB.PS)

  This document provides reference information for the low-level C language interface to the X Window System protocol. It provides a detailed description of each function in the library , as well as a discussion of the related background information.

3.1.7 *Name Server Operations Guide for BIND*

Distributed by the Internet Software Consortium, this PostScript document (BINDOPGD.PS) describes the Berkeley Internet Name Domain (BIND) Release 4.9.3 and its implementation as an Internet name server for BSD-derived operating systems.

3.2 Operating System CD-ROM

The documentation described in this section is included on the DIGITAL UNIX Operating System CD–ROM. Some of this documentation is available only when you install the software it describes.

3.2.1 Software Product Descriptions

A Software Product Description (SPD) is the legal description of the DIGITAL UNIX product. It describes the software and gives information about its capabilities and about the hardware it supports. This information is for anyone who needs a legal description of the DIGITAL UNIX product. The SPD is provided on the operating system distribution media in both PostScript and text versions.

PostScript versions of the SPDs are located in the *mnt_point*/DOCUMENTATION/POSTSCRIPT directory . They files are named as follows:

```
Digital_UNIX_C_Developers_Extensions_SPD.ps
Digital_UNIX_Server_Extensions_SPD.ps
Digital_UNIX_Operating System_SPD.ps
Prestoserve_for_Digital_UNIX_SPD.ps
Digital_UNIX_Logical_Storage_Manager_SPD.ps
```

Text versions of the SPDs are located in the *mnt_point*/DOCUMENTATION/TEXT directory . The files are names as follows:

```
Digital_UNIX_C_Developers_Extensions_SPD.txt
Digital_UNIX_Server_Extensions_SPD.txt
Digital_UNIX_Operating System_SPD.txt
Prestoserve_for_Digital_UNIX_SPD.txt
Digital_UNIX_Logical_Storage_Manager_SPD.txt
```

3.2.2 Listings of Fixes Made to the Operating System

DIGITAL maintains lists of fixes it makes to each version of the DIGITAL UNIX operating system. Known as CLDs (for Customer Log Desk), these text files are located in the the *mnt_point*/DOCUMENTATION/TEXT directory . The files are named as follows:

```
Digital_UNIX_V3_2C_CLD_Fixes.txt
Digital_UNIX_V3_2D_CLD_Fixes.txt
Digital_UNIX_V3_2G_CLD_Fixes.txt
Digital_UNIX_V4_0_CLD_Fixes.txt
Digital_UNIX_V4_0A_CLD_Fixes.txt
Digital_UNIX_V4_0B_CLD_Fixes.txt
DIGITAL_UNIX_V4_0D_CLD_Fixes.txt
```

3.2.3 Alternate Formats for *Release Notes* and *Installation Guide*

The *Release Notes for Version 4.0D* and the*Installation Guide* are provided in PostScript format in the *mnt_point*/DOCUMENTATION/POSTSCRIPT directory . The files are named as follows:

```
DIGITL_UNIX_V4_0D_Release_Notes.ps
Digital_UNIX_V4_0B_Install_Gde.ps
```

The *Release Notes for Version 4.0D* are also provided in text format in the *mnt_point*/DOCUMENTATION/TEXT directory . The file is named as follows:

```
DIGITL_UNIX_V4_0D_Release_Notes.txt
```

3.2.4 New and Changed Features in Prior Releases

DIGITAL maintains lists of changes it makes to each release of the DIGITAL UNIX operating system and of the new features it adds to each relase. These text files are located in the the *mnt_point*/DOCUMENTATION/TEXT directory . The files are named as follows:

```
DIGITAL_UNIX_V4.0A_Features.txt
DIGITAL_UNIX_V4.0B_Features.txt
DIGITAL_UNIX_V4.0C_Features.txt
DIGITAL_UNIX_V4.0_Features.txt
```

3.2.5 X Image Extension Documentation

The X Image Extension (XIE) code (developed by the X Consortium) provides a powerful mechanism for the transfer and display of virtually any image on X-capable hardware. Documentation for XIE is installed in compressed format in the /usr/doc/xie_v5 directory:

Before you can print a copy of one of the XIE manuals, you must uncompress that manual. For example, to uncompress the *X Image Extension Overview*, as root issue the following command:

```
% uncompress /usr/doc/xie/xie_overview.ps.Z
```

You can then print the resulting, uncompressed file: /usr/doc/xie_v5/xie_overview.ps.

The following list describes the XIE manuals. The names of the individual files are listed after the titles.

- *X Image Extension Overview* (xie_overview .ps.Z)

This manual provides general information about the X Image Extension (XIE) code. Topics covered include XIE design goals, XIE historical summary , XIE architecture, element definitions, and subsetting.

- *XIElib Specification* (xie_lib_spec.ps.Z)

  This manual contains reference information about the XIElib functions, XIElib events, and XIElib errors. The Functions section covers such functions as startup, LUT, photomap, ROI, photoflo, client data, abort and await, photoflo element, technique, and free.

- *XIE Sample Implementation Architecture* (xie_sample_arch.ps.Z)

  This manual provides an architecture overview of XIE, including chapters on extension initialization, memory management, request dispatching, data representation, data structures, protocol requests, DIXIE photoflo management, DDXIE photoflo management, and photo elements.

- *X Image Extension Protocol Reference Manual, Version 5.0* (xie_protocol_ref.ps.Z)

  This manual specifies the X wire protocol for XIE. It defines the syntax, structure, and semantics of the XIE protocol elements. Topics covered include syntax specification, parameter types, resources, pipelined processing, import elements, process elements, export elements, events and errors, techniques, service class, and protocol encodings.

3.2.6 Emacs Documentation

The Free Software Foundation provides two documents to help users of Emacs and Emacs Lisp software. These files are available only if the `FSFEMACSSRC300` subset is installed on your system. (To use Emacs and Emacs Lisp, install the `OSFEMACS300` subset.)

These documents are located in the `/usr/lib/emacs/doc` directory . The names of the individual files are listed after the titles.

- *GNU Emacs Manual* (emacs.ps)

  This manual provides information about how to use and customize the Emacs text editor. It is primarily a reference manual, but can also be used as a tutorial. This manual is intended for general users and anyone who uses Emacs.

- *GNU Emacs Lisp Reference Manual* (elisp.ps)

  This manual describes Emacs Lisp and presumes considerable familiarity with how to use the Emacs text editor. The earlier chapters describe Emacs features that have counterparts in other programming languages. The later chapters describe features that are peculiar to Emacs Lisp or relate specifically to editing. This manual is for programmers.

3.2.7 Display PostScript Documentation

The Display PostScript system is described in the *PostScript Language Reference Manual*, which is included in the DIGITAL UNIX documentation set. To update the Display PostScript documentation, Adobe System, Inc., provides some supplemental documentation. These supplements are provided in compressed format in the `/usr/share/doclib/dps` directory . Before you can print a supplement, you must uncompress it. For example, to uncompress the *Level 2 Changes for X*, from root issue the following command:

```
% uncompress /usr/share/doclib/dps/Developer-TechNote.1-001.ps.Z
```

You can then print the resulting, uncompressed file.

The following list describes the Display PostScript documentation supplements. The names of the individual files are listed after the titles.

- *Level 2 Changes for X* (Developer-T echNote.1-001.ps.Z)

  This supplement describes the changes made to the X implementations of the Display PostScript system for PostScript Level 2.

- *Type 2 Image Dictionary* (Developer-T echNote.1-002.ps.Z)

  This supplement describes the Type 2 image dictionary , an operand for the `image` operator in the Display PostScript system. The Type 2 image dictionary is an extension to the Type 1 dictionary . It allows the `image` operator to use pixel data from a pixmap, the current window , or another window as source when copying into the current window .

- *Multiple Master Fonts in the DPS Toolkit Font Panel* (Developer-T echNote.1-003.ps)

  This supplement describes new support for multiple master fonts in the Display PostScript Toolkit for X font panel. The supplement also describes how the font panel supports nontypographic sorting and a value-changed callback.

- *Writing Applications That Use the Resource Location Library* (Developer-T echNote.1-004.ps)

  This supplement describes how applications can use resource paths to become easier to use and customize. Resource paths are included in calls to the resource location library , which applications can use to find resources such as fonts.

3.3 Associated Products CD–ROMs

The Associated Products CD–ROMs contain documentation for various components of DIGITAL UNIX. The document called *DIGITAL UNIX Version 4.0D CD-ROMs*, described in Section 3.1.1, provides a list of the applications located on these CDs, as do the 00README.TXT files located on the CDs.

Both CDs now include a graphical user interface that you can use to access documentation and to install product software from within the Netscape browser. To use this interface, invoke Netscape and go to the following location:

```
file:/<mount_point>/index.html
```

A list of products on the CD-ROM will be displayed. When you click on a product name you will be given the option to install the product or access the documentation, if applicable.

To view Bookreader or PostScript files while using Netscape, your system will need to be configured so that it will recognize the file type of the file you select and will invoke Bookreader or a PostScript viewer.

4

The DIGITAL UNIX Reference Pages

The DIGITAL UNIX operating system provides an extensive set of reference pages (also called man pages or manual pages), each of which describes one topic, such as a command, function, or file. This chapter discusses the reference pages.

4.1 Reading Reference Pages On Line

You can use a Web browser to read the reference pages on line, and print them by clicking on the browser's Print menu. Alternatively, you can use the `xman` or `man` utilities from the command line to read the reference pages on line.

The `xman` command starts an X Window System reference-page browsing tool. One of the functions of the tool is to display a list of the reference pages. You display a reference page by double-clicking on its name in the list. For more information about the `xman` command, start up the tool by entering the following command:

```
% xman &
```

(The ampersand (&) runs the command in the background, allowing the command line to be used for other tasks.) The application displays a small window that contains three buttons. Click on the Manual Page button to read a reference page about the `xman` command.

The `man` command displays the reference page specified on the `man` command line. For more information about the `man` command, read the `man`(1) reference page. To display this reference page, issue the following command:

```
% man man
```

The system manager determines whether the reference pages are available on the system at system installation time. If you receive an error message when you try to read reference pages, the problem might be that they are not installed on the system.

See Section 1.4 for information about viewing the reference pages on the Documentation CD–ROM using the `webman` browser.

4.2 Reading Reference Pages in Printed Books

DIGITAL provides a separately orderable Reference Pages Documentation Set. In this printed format, the Reference Page books are grouped according to their sections, each of which contains one or more volumes.

Spines on the books are printed in green to help you quickly find the Reference Pages on your bookshelf. This color-coding is reinforced with the use of the R icon on the spine of the books.

To order the 17–volume Reference Page Kit, refer to Chapter 6 or contact your DIGITAL representative.

Note

The Reference Page Kit is usually updated only with major releases of DIGITAL UNIX. Therefore, the online reference pages provide more

current information about features that are added or revised in minor releases.

4.3 Overview of the Sections

The reference pages are grouped into sections, according to their function, audience, or both. The section numbers appear as numbers in parentheses next to the name of the reference page. For example:

```
lpr(1)
automount(8)
createlabel(3)
```

The following list describes the section numbers:

Reference Pages Section 1

Section 1 describes user commands that are available to everyone who uses the DIGITAL UNIX operating system.

In printed form, this section is divided into four volumes.

Reference Pages Section 2

Section 2 defines system calls (entries into the DIGITAL UNIX kernel) that programmers use. The introduction to Section 2, `intro`(2), lists error numbers with brief descriptions of their meanings. The introduction also defines many of the terms used in this section.

In printed form, this section exists in one volume.

Reference Pages Section 3

Section 3 describes the routines available in DIGITAL UNIX programming libraries, including the C library , Motif library , and X library . This section is for programmers.

In printed form, this section is divided into six volumes.

Reference Pages Section 4

Section 4 describes the format of system files and how the files are used. The files described include assembler and link editor output, system accounting, and file system formats. This section is for programmers and system administrators.

In printed form, this section is divided into two volumes.

Reference Pages Section 5

Section 5 contains miscellaneous information, including ASCII character codes, mail-addressing formats, text-formatting macros, and a description of the root file system. This section is for programmers and system administrators.

In printed form, this section is in one volume.

Reference Pages Section 7

Section 7 describes special files, related device driver functions, databases, and network support. This section is for programmers and system administrators.

In printed form, this section is in one volume.

Reference Pages Section 8 and 1m

Section 8 describes commands for system operation and maintenance. It is for system administrators.

In printed format, this section is divided into two volumes.

5

Device Driver Documentation

The device driver documentation has been moved into a separately orderable kit. The DIGITAL UNIX Device Driver Kit (DDK) provides programming information specifically for system engineers who are developing device drivers for the DIGITAL UNIX operating system.

This kit includes printed versions of the device driver documentation and a CD–ROM, which provides device driver examples, X Consortium code, white papers, and HTML versions of the device driver documentation. For information about how to order the Device Driver Kit, refer to Chapter 6 or contact your DIGITAL representative.

In printed form, the spines of the device driver books are printed in orange to help you find them quickly on your bookshelf. This color-coding is reinforced with the use of the D icon on the spine.

The rest of this section describes the books in the DDK. This information is provided here because of the close relationship between the device driver documentation and the DIGITAL UNIX documentation set:

Writing Device Drivers: Tutorial

This manual provides information for systems engineers who write device drivers for hardware that runs the DIGITAL UNIX operating system. Systems engineers can find information on driver concepts, device driver interfaces, kernel interfaces used by device drivers, kernel data structures, configuration of device drivers, and header files related to device drivers.

Writing Device Drivers: Advanced Topics

This manual provides information on topics that are beyond the scope of the core tutorial. Systems engineers can find information on such advanced topics as kernel threads and writing device drivers in a symmetric multiprocessing (SMP) environment. The manual also contains information about writing disk drivers.

Writing Device Drivers: Reference

This manual contains descriptions of the kernel interfaces, `ioctl` commands, and data structures associated with device drivers.

Writing EISA and ISA Bus Device Drivers

This manual provides information for systems engineers who write device drivers for the EISA/ISA bus. The manual describes EISA/ISA bus-specific topics, including EISA/ISA bus architecture and data structures that EISA/ISA bus device drivers use.

Writing PCI Bus Device Drivers

This manual provides information for systems engineers who write device drivers for the PCI bus. The manual describes PCI bus-specific topics, including PCI bus architecture and data structures that PCI bus device drivers use.

Writing Device Drivers for the SCSI/CAM Architecture Interfaces

This manual provides information for systems engineers who write device drivers for the SCSI/CAM Architecture interfaces. It provides an overview of the DIGITAL UNIX SCSI/CAM Architecture and describes User Agent routines, data structures, common and generic routines and macros, error handling, and debugging routines.

Writing TURBOchannel Device Drivers

This manual contains information that systems engineers need to write device drivers which operate on the TURBOchannel bus. The manual describes TURBOchannel-specific topics, including TURBOchannel kernel interfaces that TURBOchannel device drivers use.

Writing VMEbus Device Drivers

This manual contains information systems engineers need to write device drivers that operate on the VMEbus. The manual describes VMEbus-specific topics, including VMEbus architecture and kernel interfaces that VMEbus device drivers use. A VMEbus device driver example illustrates the use of these kernel interfaces.

Writing Network Device Drivers

This book discusses topics associated with writing network device drivers for computer systems running the DIGITAL UNIX operating system.

Writing a Graphics Device Driver and DDX for the DIGITAL UNIX X Server

This manual describes how to add graphics device support to the X Window system on systems running the DIGITAL UNIX operating system.

Guide to Preparing Product Kits

This manual describes the procedures for creating, maintaining, and installing the collections of files and directories that make up a layered products kit. A kit is the standard mechanism by which layered product modifications are delivered and maintained on a DIGITAL UNIX operating system. Kits are distributed on CD–ROM, diskettes, or tape for installation on customer's systems.

This is the same manual that is included in the Programmer's Kit of the DIGITAL UNIX documentation set.

6

How to Order DIGITAL UNIX Documentation

You can order DIGITAL UNIX documentation via modem from the Electronic Store, by telephone, or through direct mail.

To place an order at the Electronic Store from anywhere in the USA, Canada, or Puerto Rico, dial 800-234-1998. For assistance using the Electronic Store, call 800-DIGITAL (800-344-4825).

To place a telephone or direct mail order, refer to the following table to determine the telephone number to call or the address to which to send the order:

Your Location	Call	Contact
Continental USA, Alaska, or Hawaii	800-DIGITAL	Digital Equipment Corporation, P.O. Box CS2008 Nashua, New Hampshire 03061
Puerto Rico	809-754-7575	Local DIGITAL subsidiary
Canada	800-267-6215	Digital Equipment of Canada, Attn: DECdirect Operations KAO2/2 P.O. Box 13000 100 Herzberg Road Kanata, Ontario, Canada K2K 2A6
International		Local DIGITAL subsidiary or approved distributor
Internal		SSB Order Processing - NQO/V19 *or* U.S. Software Supply Business Digital Equipment Corporation 10 Cotton Road Nashua, NH 03063-1260

For internal orders, submit an Internal Software Order Form (EN-01740-07).

Table 6–1 provides the order number for the DIGITAL UNIX Documentation CD–ROM.

Table 6–1: DIGITAL UNIX Documentation CD–ROM

Name	Order Number
DIGITAL UNIX Documentation CD–ROM	QA-MT4AA-G8

Table 6–2 lists the printed documentation kits you can order.

Table 6–2: DIGITAL UNIX Documentation Kit Order Numbers

Documentation Kit	Order Number
DIGITAL UNIX Documentation Kit	QA-MT4AA-GZ
End User Documentation Kit	QA-MT4AB-GZ
Startup Documentation Kit	QA-MT4AC-GZ
General User Documentation Kit	QA-MT4AD-GZ
System and Network Management Documentation Kit	QA-MT4AE-GZ
Developer's Documentation Kit	QA-MT5AA-GZ

Table 6–2: DIGITAL UNIX Documentation Kit Order Numbers (cont.)

General Programming Documentation Kit	QA-MT5AB-GZ
Windows Programming Documentation Kit	QA-MT5AC-GZ

You can order some manuals individually . Table 6–3 lists those manuals and provides the order number for them.

Table 6–3: Separately Orderable Manuals

Manual	Order Number
Release Notes	AA-QTLMC-TE
Installation Guide	AA-QTLGB-TE
System Administration	AA-PS2RE-TE
Network Administration	AA-PS2SC-TE
System Configuration and Tuning	AA-Q0R3F-TE
Programmer's Guide	AA-PS30D-TE
Technical Overview	AA-QTLLA-TE
ULTRIX to DIGITAL UNIX Migration	AA-PS3EE-TE

You can order each of the quick reference cards and the *Documentation Map*, in packages of 15. Table 6–4 lists the order numbers for these 15-item packages.

Table 6–4: Reference Card and Poster Documentation Packages

Package Name	Order Number
Quick Reference Card Package	AI-Q6PBB-TE
Update Installation Quick Reference Card Package	AI-Q6PCC-TE
Documentation Map Package	AI-Q6PDD-TE

Table 6–5 provides the order number for separately orderable documentation kits.

Table 6–5: Separately Orderable Documentation Kits

Kit Name	Order Number
Reference Pages Documentation Kit	QA-MT4AG-GZ
Device Driver Kit	QA-MT4A V-G8

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