

Tru64 UNIX

Documentation Overview

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Product Version: Tru64 UNIX Version 4.0G

This manual describes the documentation for the *Compaq Tru64™ UNIX®* operating system. It also describes the structure of the documentation kits and provides information about ordering them.

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Contents

About This Manual

1 Finding the Documentation You Need

1.1	Defining the Documentation Set	1-1
1.2	Changes to Version 4.0G Documentation	1-2
1.3	What You Get	1-3
1.3.1	Online Documentation	1-3
1.3.1.1	The Documentation CD-ROM	1-4
1.3.1.2	Documentation on the World Wide Web	1-5
1.4	Printed Documentation	1-6
1.5	Documentation for Layered Applications	1-8
1.5.1	Products Packaged with Tru64 UNIX	1-8
1.5.2	Tru64 UNIX Alpha Online Documentation Library	1-9
1.5.3	Device Driver Documentation	1-9

2 The Tru64 UNIX Manuals

2.1	End User Documentation	2-1
2.1.1	Startup Documentation	2-1
2.1.2	General User Documentation	2-4
2.1.3	System and Network Management Documentation	2-6
2.2	Documentation for Program Developers	2-9
2.2.1	General Programming Documentation	2-9
2.2.2	Windows Programming Documentation	2-13

3 Supplementary Documentation

3.1	Overview	3-1
3.2	Web-Based Best Practices Documentation	3-1
3.3	Documentation CD-ROM	3-2
3.3.1	<i>AdvFS Guide to File System Administration</i>	3-2
3.3.2	<i>Advanced Printing Software User Guide</i>	3-2
3.3.3	<i>Compaq Safety & Comfort Guide</i>	3-3
3.3.4	DECwindows Development Documentation	3-3
3.3.5	<i>How to Order Tru64 UNIX Documentation</i>	3-4
3.3.6	Java Documentation	3-4

3.3.7	<i>Name Server Operations Guide for BIND</i>	3-4
3.3.8	<i>New and Changed Features from Prior Releases</i>	3-4
3.3.9	<i>Performance Manager</i>	3-4
3.3.10	<i>sendmail Installation and Operation Guide</i>	3-5
3.3.11	ToolTalk Service Documentation	3-5
3.3.12	Working in a Non-English Environment	3-5
3.3.13	X Window System Documentation	3-6
3.4	Operating System CD-ROM	3-6
3.4.1	Software Product Descriptions	3-7
3.4.2	Listings of Patches to the Operating System	3-7
3.4.3	X Image Extension Documentation	3-7
3.5	Associated Products CD-ROMs	3-8

4 The Tru64 UNIX Reference Pages

4.1	Reading Reference Pages On Line	4-1
4.1.1	Using the Documentation CD-ROM	4-1
4.1.2	Using webman	4-1
4.1.3	Using the xman Command	4-2
4.1.4	Using the man Command	4-2
4.2	Reading Reference Pages in Printed Books	4-2
4.3	Overview of the Sections	4-3

5 Device Driver Documentation

A How to Order Tru64 UNIX Documentation

Index

Figures

1-1	Structure of the Tru64 UNIX Documentation Kit	1-7
-----	---	-----

Tables

A-1	Tru64 UNIX Documentation Kits and CD-ROM	A-1
-----	--	-----

About This Manual

This manual describes the documentation that comes with the *Compaq Tru64 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 manual is for anyone who needs to access documentation about the Tru64 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

This manual has been revised to provide you with information about changes to the Tru64 UNIX documentation that have been made since the last release of the operating system. The *Glossary of Common UNIX and General Computer Terms* is now in the *Technical Overview*.

For an overview of the major changes to the Version 4.0G documentation set, see *Section 1.2*.

Organization

This manual is organized as follows:

- | | |
|------------------|--|
| <i>Chapter 1</i> | Provides general information about the Tru64 UNIX documentation set. |
| <i>Chapter 2</i> | Describes the Tru64 UNIX documentation set, provides a description of each manual, and describes how the documentation is packaged. |
| <i>Chapter 3</i> | Describes documentation that supplements the Tru64 UNIX documentation set. Some of these documents are produced by Compaq and others are produced by other organizations and provided by Compaq to help meet specific needs when working with the Tru64 UNIX operating system. |
| <i>Chapter 4</i> | Describes the Tru64 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.
- Appendix A* Provides information on how to order Tru64 UNIX printed documentation.

Reader's Comments

Compaq welcomes any comments and suggestions you have on this and other Tru64 UNIX manuals.

You can send your comments in the following ways:

- Fax: 603-884-0120 Attn: UBPG Publications, ZKO3-3/Y32
- Internet electronic mail: readers_comment@zk3.dec.com

A Reader's Comment form is located on your system in the following location:

```
/usr/doc/readers_comment.txt
```

- Mail:

Compaq Computer Corporation
UBPG Publications Manager
ZKO3-3/Y32
110 Spit Brook Road
Nashua, NH 03062-2698

A Reader's Comment form is located in the back of each printed manual. The form is postage paid if you mail it in the United States.

Please include the following information along with your comments:

- The full title of the book and the order number. (The order number is printed on the title page of this book and on its back cover.)
- The section numbers and page numbers of the information on which you are commenting.
- The version of Tru64 UNIX that you are using.
- If known, the type of processor that is running the Tru64 UNIX software.

The Tru64 UNIX Publications group cannot respond to system problems or technical support inquiries. Please address technical questions to your local system vendor or to the appropriate Compaq technical support office. Information provided with the software media explains how to send problem reports to Compaq.

Finding the Documentation You Need

You can find most of the Tru64 UNIX documentation you need on the Documentation CD-ROM that comes with the Tru64 UNIX product and also on the World Wide Web. Most of this documentation is provided on line in HTML and PDF format and is also available in printed books.

Your Web browser gives you access to the HTML format, and the Adobe Acrobat Reader lets you view and print the PDF versions. The printed books are packaged in kits that you can purchase from Compaq.

Additional documentation is included on the Tru64 UNIX Operating System CD-ROM and on the Associated Products CD-ROMs.

This chapter can help you to quickly find the documentation you need, in the format that is most convenient to you.

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 and reference pages that help you to use the Tru64 UNIX operating system, including the components provided when you install the system's optional and mandatory subsets. Most of this documentation was created by Compaq 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 Tru64 UNIX reference pages are available as optional subsets of the operating system and in HTML form on the Documentation CD-ROM. They are also available in printed format in a 22-volume kit. For information about the reference pages, see Chapter 4.

Documentation to aid program developers in writing device drivers for Tru64 UNIX was produced by Compaq writers working closely with the device driver engineers. This documentation is packaged in a separately orderable kit that also includes driver development tools, device driver

examples, and X Consortium code. For information about the device driver documentation, see Chapter 5.

- **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 Tru64 UNIX operating system, and industry reference material and white papers that come from Compaq engineers and other sources. Supplementary documentation exists only on line, so it is not available in any of the printed Tru64 UNIX documentation kits. 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 Compaq's C++ product and the TruCluster Server products. For more information, see Section 1.5.

1.2 Changes to Version 4.0G Documentation

With this release of Tru64 UNIX, the following books in the core documentation set have been updated to reflect changes to the operating system:

- *Release Notes for Version 4.0G*
- *Technical Overview*
- *Network Programmer's Guide*
- *Compaq C Language Reference Manual* (Formerly *DEC C Language Reference Manual*)

Other noteworthy changes are as follows:

- A new book, *System Configuration Supplement: OEM Platforms*, has been added to the documentation set.

The printed version of this manual is included in the System and Network Management Documentation Kit; the online version is in the System and Network Management Documentation category.

- The *Glossary of Common UNIX and General Computer Term*, once included in this manual, is now in *Technical Overview*, where many of the terms defined in the Glossary are discussed in the text. Also, the Glossary is now accessible directly from the General User category of the Documentation CD-ROM and on the Tru64 UNIX documentation Web site. (See Section 1.3.1.1 for an overview of the Documentation CD and Section 1.3.1.2 for an overview of the Tru64 UNIX documentation on the Web.)

- The online documentation library has been reorganized. The Supplementary Documentation category was removed, and the books in that category have been relocated to the appropriate subject categories. Section 1.3.1.1 describes the online documentation.

Various reference pages have been updated to reflect new features and enhancements added to the operating system.

1.3 What You Get

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

- If you purchase a Tru64 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 Tru64 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 printed versions of the books in the Startup documentation that were revised.
- If you purchase an Update Contract for the documentation set, you receive printed versions of the books that have been updated.
- If you purchase a system with the Tru64 UNIX operating system preinstalled (often called a FIS system, for factory installed software), online versions of the following books are installed on the system:
 - *Release Notes for Version 4.0G*
 - *Installation Guide*
 - *Security*
 - *System Administration*
 - *Network Administration*
 - *Technical Overview*
 - *Documentation Overview* (the book you are reading)
 - *Safety & Comfort Guide*

1.3.1 Online Documentation

The documentation for the Tru64 UNIX operating system, including the reference pages, is available on the Tru64 UNIX Documentation CD-ROM in a format that is readable with a Web browser or with the Adobe Acrobat Reader.

Most of this documentation, as well as documentation for associated applications, is also available on the World Wide Web (see Section 1.3.1.2). The features that are available on the Documentation CD-ROM, such as the links to other documentation, are also available on the Web.

If you are working on an Alpha system, the operating system provides a Netscape browser for viewing the HTML documentation. If you want to view the documentation on a Windows PC or Macintosh, you will need a browser that supports frames and Java Script Version 1.1. Compaq recommends using Version 4.0 or higher of Netscape Navigator, Netscape Communicator, or Microsoft Internet Explorer.

To view the PDF files, you need to install Version 3.0 or higher of the Adobe Acrobat Reader or the Reader plug-in to your Web browser. The Documentation CD-ROM provides the Acrobat Reader for Tru64 UNIX systems, Windows PCs, Macintosh, and several other platforms. You can also obtain the latest version directly from the Adobe Systems Inc. Web site:

<http://www.adobe.com>

With Acrobat Reader, you can scroll through books, print selected sections or entire books, and copy sections to the clipboard.

1.3.1.1 The Documentation CD-ROM

The Documentation CD-ROM contains HTML and PDF versions of Tru64 UNIX documents, including books, white papers, and the complete set of operating system reference pages. The CD-ROM provides links to these HTML and PDF documents.

You can use the Tru64 UNIX Documentation CD-ROM on a Tru64 UNIX system, as well as on a Windows PC or Macintosh – laptop or workstation – or on any other system that uses the ISO 9660 Level 1 CD-ROM standard. (For additional information, see the information on the Documentation CD-ROM jacket.)

To help you locate specific information in the documentation, the CD-ROM contains a copy of the AltaVista Search CD-ROM software with a complete index of the HTML documents. The AltaVista software runs on an x86-based PC with Windows 95, Windows 98, Windows 2000, and Windows NT Version 4.0.

The CD's online Documentation Library is arranged into categories that generally follow the structure of the printed documentation kits. Each category is represented by a bulleted list, with the bullet for each book colored to indicate the documentation subkit to which the book belongs:

- A blue bullet indicates General User Documentation.
- A purple bullet indicates Programming Documentation.

- A maroon bullet indicates the System and Network Management Documentation.
- A silver bullet indicates Supplementary Documentation, which is documentation that is not part of any kit and cannot be ordered from Compaq.
- A green bullet indicates the Reference Pages.

Books that meet the needs of different audiences appear in several categories. For example, you will find the *Security* book in the General User, Programming, and System and Network Management categories because it serves each of those audiences. Because it is part of the General User subkit, its bullet is blue in all of the categories in which it appears.

Most cross-references are hot links, so you can follow those references from book to book, from book to reference page, from reference page to book, and from reference page to reference page.

Each book you refer to opens in a separate window so you can easily move from book to book as you gather the information you need. When following links to reference pages, the first reference page opens in a new window, and references to subsequent reference pages will appear in the same reference page window as long as you keep it on your screen.

The Documentation CD-ROM also contains the *webman* viewer, a program you can use with your browser to view reference pages. For information about the *webman* viewer, see Chapter 4.

To mount the Documentation CD-ROM on Tru64 UNIX systems, PCs, and Macintosh computers, see the inside panels of the Documentation CD-ROM jacket. The Tru64 UNIX *Installation Guide* provides an overview of using CD-ROMs on Tru64 UNIX systems.

1.3.1.2 Documentation on the World Wide Web

You can find most of the Tru64 UNIX core and supplementary documentation, the reference pages, and other useful documentation on the World Wide Web.

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

http://www.tru64unix.compaq.com/faqs/publications/pub_page/pubs_page.html

There you will find documentation sets for Tru64 UNIX versions dating back to Version 3.0. Books for the current and most recent versions are available in HTML and PDF formats. The books for earlier versions of the operating system are available only in PostScript format.

Beginning with the Version 4.0D release, the *Documentation Overview* lists the documentation changes for each release. You might want to begin

with the *Documentation Overview* in your search for information about the documentation in prior versions.

The Web site also gives you access to the Tru64 UNIX reference pages, as well as to the following documentation:

- Tru64 UNIX Best Practices documentation (See Section 3.2 for details)
- Tru64 UNIX Device Driver documentation library (See Chapter 5 for details)
- TruCluster Server (including the TruCluster reference pages)
- Advanced Server for UNIX
- Open Source Internet Solutions for Tru64 UNIX
- Tru64 UNIX Porting Guides
- Tru64 UNIX POSIX Conformance Documentation

The Web also provides a way to provide updates to documentation between formal product releases. For example, Compaq maintains online technical updates, which provide information about restrictions and problems that have been discovered with specific versions since their release. The following is the *Technical Update* Web site for the Version 4.0G release:

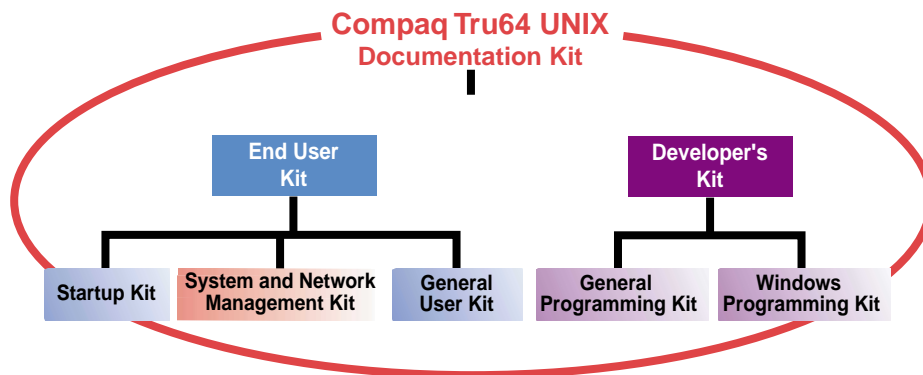
<http://www.tru64unix.compaq.com/faqs/publications/updates/V40G/TITLE.HTM>

Compaq recommends that you view this site periodically to see if any new information has been added.

1.4 Printed Documentation

When you purchase a Tru64 UNIX media kit, you receive printed versions of various 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 Tru64 UNIX Documentation Kit (Figure 1–1) or one or more of its subkits, as described in Chapter 2.

Figure 1–1: Structure of the Tru64 UNIX Documentation Kit



- End User Documentation Kit

This kit contains all the information needed to install and use the Tru64 UNIX system. This kit is divided into three subkits as follows:

- Startup Documentation Kit

This kit is primarily for the person who installs the Tru64 UNIX operating system. It contains information on how to configure software components and some information (such as the *Release Notes*) needed by all Tru64 UNIX users.

When you order the Tru64 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 Tru64 UNIX operating system or network. The manuals in this kit provide information on how to configure, manage, and tune Tru64 UNIX systems.

- General User Documentation Kit

This kit provides general information on how to use the Tru64 UNIX operating system. The manuals in this kit are for everyone who uses Tru64 UNIX.

- Developer's Documentation Kit

This kit is for software developers who write programs on or for the Tru64 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 Tru64 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 table 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.

1.5 Documentation for Layered Applications

Compaq and third-party vendors produce many applications that run on Tru64 UNIX systems. The documentation for most of these products is included with the individual application software. The following sections provide some guidance.

1.5.1 Products Packaged with Tru64 UNIX

The CD-ROMs in the Tru64 UNIX media kit include the software and documentation for several separately licensed products. You do not need a license to view this documentation, which in most cases is provided in both HTML and PDF (or PostScript) formats.

The following separately licensed products are among those included with the kit:

- TruCluster Server products

- Advanced File System (AdvFS) Utilities
- Advanced Server for UNIX

See the *Tru64 UNIX Version 4.0G CD-ROMs* sheet (included in printed form in the Tru64 UNIX media kit and in HTML form on the Documentation CD-ROM) for a complete list and the location of the layered applications included with Tru64 UNIX. See Section 3.5 for information about the Tru64 UNIX Associated Products CD-ROMS.

1.5.2 Tru64 UNIX Alpha Online Documentation Library

Many of the layered applications produced by Compaq, such as Compaq's C++ product and the Distributed Computing Environment (DCE), are included on the Tru64 UNIX Alpha Software Product Library, a collection of CD-ROMs in a kit that is updated every three months. The documentation for these products is included on the companion Tru64 UNIX Alpha Online Documentation Library CD-ROM. These software and documentation kits are separately orderable products; they are not included with the Tru64 UNIX media kit. For information about ordering these kits, contact your Compaq sales representative.

1.5.3 Device Driver Documentation

Documentation for programmers who create device driver software for the Tru64 UNIX operating system is available as a separately orderable kit. See Chapter 5 for more information about the Device Driver Documentation Kit.

The Tru64 UNIX Manuals

This chapter provides brief descriptions of the core documentation. It is divided into sections that follow the structure of the printed documentation kits. All of the books in this chapter are available as printed books, and except where indicated, are also provided in various online formats. See Section 1.3.1 for information about the online Documentation Library structure.

Except for a few externally published manuals, the documentation described here was produced by Compaq writers working closely with the developers of the Tru64 UNIX operating system.

2.1 End User Documentation

Manuals for the end user contain the information you need to install and configure a Tru64 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 documentation, and system and network management documentation.

2.1.1 Startup Documentation

The startup documentation is packaged in printed form with your Tru64 UNIX media. It consists of the documents you need to install, configure, and begin using your system.

Documentation Overview

This is the book you are reading.

Installation Guide

This manual describes the procedures for performing an update installation, a basic installation, or an advanced installation of the Tru64 UNIX product on all supported processors. It also discusses system management procedures in a standalone environment.

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 options 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.

Release Notes for Version 4.0G

The *Release Notes for Version 4.0G* are for all users of the Tru64 UNIX operating system. This book includes the following information:

- An overview of the new and changed features of the Version 4.0G software
- Release notes about installing the software
- Processor-specific release notes
- Release notes about the base operating system
- Release notes about the development environment
- Release notes about the graphical interfaces
- Additions and corrections to the books in the Tru64 UNIX documentation set
- Announcements about features and interfaces that are scheduled for removal in future versions of Tru64 UNIX
- Disk-space requirements for installing software subsets
- System limits for the major components of this release
- Information about enabling and disabling UID and GID support
- Instructions for installing and configuring Netscape Navigator and Netscape FastTrack Server
- Solutions to potential problems with the Advanced File System (AdvFS)
- Information about increasing the maximum number of open files per process
- Information about enabling the enhanced core file naming
- Information about child process early-exit notification feature
- Information about Thread Local Storage (TLS) support in DEC C

Compaq recommends that you read the *Release Notes* before installing or using the Tru64 UNIX operating system.

Note

Compaq maintains an online *Technical Update* that contains information about restrictions and problems that have been discovered since Version 4.0G began shipping. To view this document on the Web, go to the following URL:

<http://www.tru64unix.compaq.com/faqs/publications/updates/V40G/TITLE.HTM>

Compaq recommends that you visit this site periodically to see if any new information has been added.

Technical Overview

This manual describes the major components of the Tru64 UNIX operating system. The opening chapter provides an introduction to the operating system, including discussions of recent enhancements, licensing, and available optional software. This is followed by more in-depth discussions on various aspects of the operating system. A partial list of the topics discussed follows:

- The various features available to system administrators
- The available networking protocols and applications
- The supported file systems
- The major features of the Tru64 UNIX development environment
- Tru64 UNIX security
- Issues concerning internationalization

Because this book might introduce you to new terms, it now contains the *Glossary of Common UNIX and General Computer Terms*, which was previously packaged with this *Documentation Overview*. When using the online version of the *Technical Overview*, some of the terms used within the discussions are linked to the Glossary, which means you are a mouse click away from the term's definition.

Tru64 UNIX Version 4.0G CD-ROMs

This one-page document provides a brief listing of the components on the CD-ROMs in the media kit. An online version of this document is included on the General User category of the Tru64 UNIX Documentation CD-ROM.

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

This foldout card provides easy access to the information needed to upgrade a Tru64 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*.

2.1.2 General User Documentation

General user documentation contains important information for all users of the Tru64 UNIX operating system. The books in this category provide introductory information for people who are unfamiliar with Tru64 UNIX.

CDE Companion

This manual provides an introduction to Compaq's implementation of the Common Desktop Environment (CDE), an easy method of interacting with the Tru64 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 provides quick-start information on topics such as logging onto 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 Tru64 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 Tru64 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.

Master Index

This book can help you find the information you need in the core documentation set, as follows:

- In the printed version of this book, the index items advise you in which books to look and direct you to the pages where the topic is discussed.
- In the online version, clicking on an index item in many cases will take you to the appropriate book at the point where the topic is discussed. For the Common Desktop Environment books and various other books, clicking on the index item will take you only to the beginning of the appropriate book, where you can use the table of contents or the book's index to find out where the topic is discussed.

Security

This manual provides information needed by users and system administrators who are working on Tru64 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 Tru64 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 Tru64 UNIX operating system with enhanced security. This part assumes general programming knowledge, including knowing how to use the Tru64 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 Tru64 UNIX system problems.

This manual describes the DECevent command features related to the translation and reporting of events on Tru64 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 Tru64 UNIX operating systems.

Guide to Prestoserve

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

This manual describes how to manage and maintain a Tru64 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 Tru64 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.

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 `/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.

Software License Management

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

Although intended primarily for system administrators responsible for managing software licenses on Tru64 UNIX systems, this manual also provides information for anyone who uses licensed software on Tru64 UNIX systems.

System Administration

This manual describes how to configure, use, and maintain the Tru64 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.

System Configuration and Tuning

This manual describes how to set up and tune high-performance and high-availability systems running the Tru64 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 replaced the *System Tuning and Performance Management* manual in the DIGITAL UNIX Version 4.0D release.

System Configuration Supplement: OEM Platforms

This manual provides information needed to set up OEM platforms running the Tru64 UNIX operating system. It helps system and network administrators configure Alpha VME single-board computers (SBCs), PCI/ISA modular SBCs, and VMEbus backplane networks in which SBCs operate as Ethernet nodes.

This manual is for experienced system and network administrators who are thoroughly familiar with their platform's I/O bus and with the operating system concepts, commands, and configurations.

ULTRIX to DIGITAL UNIX Migration Guide

This manual describes how to upgrade a system from an ULTRIX and ULTRIX Worksystem Software system to Tru64 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 (x_{dm}), 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 Tru64 UNIX. It provides information on how to perform system administration tasks for the Tru64 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 Tru64 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 Tru64 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 Tru64 UNIX programming environment.

Assembly Language Programmer's Guide

This manual describes the Alpha hardware architecture's assembly language, which is supported by the Tru64 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 Tru64 UNIX.

Asynchronous Transfer Mode

This manual describes the Tru64 UNIX Asynchronous Transfer Mode (ATM) subsystem, how to configure the subsystem, and how to use the ATM kernel interfaces. It is written for experienced UNIX kernel programmers who are responsible for writing ATM device drivers and kernel modules. After reading this manual, a kernel programmer should be able to do the following:

- Understand the ATM subsystem architecture

- Configure ATM software
- Understand how the different kernel interfaces operate
- Write a kernel module

This manual does not describe the application programming interface (API) that user-level applications would use to access the ATM subsystem. This manual is not an ATM networking tutorial.

Calling Standard for Alpha Systems

This manual defines the requirements, mechanisms, and conventions used in the interface that supports procedure calls on Tru64 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 Tru64 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.

Compaq C Language Reference Manual

This manual (previously called the *DEC C Language Reference Manual*) provides reference information for using the Compaq C language on Compaq systems. Compaq C is an ISO/ANSI-compliant C compiler for Tru64 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 Compaq 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 the Digital Portable Mathematics Library (DPML) 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.

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 Tru64 UNIX system. Kits are distributed on CD-ROM, diskettes, or tape for installation on customer's systems.

This manual is also included in the Tru64 UNIX Device Drivers Kit (DDK).

Guide to Realtime Programming

This manual is for programmers who are developing realtime applications on Tru64 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.

Ladebug Debugger Manual

The 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.

Network Programmer's Guide

This manual describes the Tru64 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 Tru64 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 Tru64 UNIX operating system, with an emphasis on the C programming language.

This manual is for all programmers who use the Tru64 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 Tru64 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 (RPC) in the Open-Network Computing Environment (ONC). 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 Tru64 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 Tru64 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 Tru64 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 KornShell (`ksh`) scripts. It also provides several example scripts of increasing complexity.

This manual is for programmers who want to develop Motif applications using KornShell scripts rather than the C programming language. This manual assumes knowledge of KornShell 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.

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.

Supplementary Documentation

To help meet specific needs when working with the Tru64 UNIX operating system, Compaq makes available documentation that supplements the core Tru64 UNIX documentation set. This chapter describes this supplementary documentation.

3.1 Overview

Supplementary documentation is provided only on line and comes from various sources. Some of this material, including all of the Best Practice documentation, is produced by Compaq writers working closely with Tru64 UNIX developers. Other documentation is produced by UNIX professionals both within Compaq and outside of the corporation. Supplementary documentation tends to be less formal in structure than the core documentation.

The Documentation CD-ROM, Operating System CD-ROM, Associated Products CD-ROMs Volumes 1 and 2 and the Compaq World Wide Web environment all contain supplementary documentation.

For example, the Associated Products CD-ROMs contain installation guides for the Multimedia Services for Tru64 UNIX run-time environment, DEEvent, and the Porting Assistant. Other component-specific information includes release notes, Software Product Descriptions (SPDs), 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.

3.2 Web-Based Best Practices Documentation

Best Practices documentation offers a recommended method for performing a task, rather than presenting all of the options available. This type of documentation walks you step-by-step through the process.

The recommend procedure might depend on your configuration environment. For example, the Best Practice for performing a particular task on a Web server might differ from the one for performing the same task on a file server. The Best Practice documentation cannot meet the needs of all users, but

it is aimed at the most common tasks and system configurations in order to meet the demands of most users.

The Best Practices documentation currently resides only on the Web at the following site:

http://www.tru64unix.compaq.com/faqs/publications/best_practices/

The volume of Best Practice documentation continues to grow, due in part to requests from customers. The Best Practices Web page provides information for sending your suggestions to Compaq. You might find new Best Practice documentation at this site each time you visit it.

3.3 Documentation CD-ROM

Supplementary documents on the Documentation CD-ROM appear on bookshelves according to their subject matter. You can identify these documents by the silver bullet that precedes them.

Much of this documentation is provided in both HTML and PDF formats; some is provided only in one of the two formats. If your system is configured as suggested, you can click on the HTML link to view the document in your Web browser or click on the PDF link to view the document using Adobe Acrobat Reader or the Acrobat Reader plugin to your Web browser.

The following sections provide brief overviews of the supplementary documents on the Documentation CD.

3.3.1 *AdvFS Guide to File System Administration*

This manual describes the Advanced File System (AdvFS) and the AdvFS Utilities. It provides detailed information on features and functions, and it gives suggestions on how to use these functions. Procedures for working at the command line and with the AdvFS graphical user interface are also described.

AdvFS is a file system option for the Tru64 UNIX operating system. It provides rapid crash recovery and a flexible structure that allows you to manage your file system while it is on line.

The AdvFS Utilities, which are available as a layered product, extend the file system capabilities by including utilities to add volumes, create clones, stripe files, and balance file domains.

3.3.2 *Advanced Printing Software User Guide*

This manual provides information about using the Advanced Printing Software, which is included as an optional component of the Tru64 UNIX operating system. The *User Guide* describes how to submit jobs to your

printer using the command line interface. It also shows you how to set up your local print environment and monitor jobs you have submitted.

This manual is also packaged with the software, as is the following Advanced Printing Software documentation:

- *System Administration and Operation Guide*
- *Command Reference Guide*
- *Release Notes*
- *Installation Guide*

3.3.3 Compaq Safety & Comfort Guide

The *Compaq Safety & Comfort Guide* describes how to best set up your workstation environment to minimize the possibility of injury and provide you with the maximum of comfort. This guide focuses on posture and on other health and work habits for computer users. Additionally, it provides product safety information applicable to all Compaq products.

3.3.4 DECwindows Development Documentation

The books in this section are designed to aid programmers who are creating or modifying applications that use the DECwindows graphical user interface.

- *DECwindows Companion to the OSF/Motif Style Guide*

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*

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 Compaq provides in the Toolkit.

- *DECwindows Extensions to Motif*

This manual describes the programming extensions that Compaq 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 3.3.13.

3.3.5 *How to Order Tru64 UNIX Documentation*

The file titled *How to Order Tru64 UNIX Documentation* duplicates the information in Appendix A.

3.3.6 *Java Documentation*

The Tru64 UNIX operating system includes a Java Development Kit (JDK), which provides tools to develop and run Java applets and programs on the Tru64 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* in the Programming Guides category 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.

3.3.7 *Name Server Operations Guide for BIND*

Distributed by the Internet Software Consortium, the *Name Server Operations Guide for BIND* describes the Berkeley Internet Name Domain (BIND) Release 4.9.3 and its implementation as an Internet name server for BSD-derived operating systems.

3.3.8 *New and Changed Features from Prior Releases*

The *New and Changed Features from Prior Releases* document lists the major features that were introduced and changes that were made to the Tru64 UNIX operating system from Version 4.0 through Version 4.0F. The information in this document was originally presented in the *New and Changed Features* chapter of the operating system *Release Notes* for each of those versions.

3.3.9 *Performance Manager*

Performance Manager is a real-time performance manager that allows system administrators to detect and correct performance problems in Tru64 UNIX systems. The three primary components of the Performance Manager are a graphical user interface, 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.

3.3.10 *sendmail* Installation and Operation Guide

The *sendmail Installation and Operation Guide* describes the configuration file for Version 8.7 of the `sendmail` utility, which implements a general-purpose internetwork mail routing facility under the Tru64 UNIX operating system.

The `sendmail` utility is not tied to any one transport protocol — its function can be likened to a crossbar switch, relaying messages from one domain into another. In the process, it can do a limited amount of message header editing to put the message into a format that is appropriate for the receiving domain. All of this is done under the control of a configuration file.

3.3.11 ToolTalk Service Documentation

ToolTalk is an interapplication communication service that is included as part of the Common Desktop Environment. ToolTalk provides a way for applications and desktop components to request services of each other and to announce events. The following books provide information about the ToolTalk service:

- *ToolTalk User's Guide*

This manual is useful to developers who create or maintain applications that use the ToolTalk service to interoperate with other applications; it is also useful to system administrators who set up workstations. This manual assumes the reader is familiar with operating system commands, system administrator commands, and system terminology.

- *ToolTalk Reference Manual*

This manual describes components of the ToolTalk application programming interface such as enumerated types and functions. It also describes ToolTalk-enhanced operating system shell commands, error messages, and standard ToolTalk messaging sets.

See also the *Common Desktop Environment: ToolTalk Messaging Overview* in the Programming Guides category. This manual is part of the core documentation set.

3.3.12 Working in a Non-English Environment

The following guides provide language-specific information, such as character sets and locales, for end users and programmers who want to use and develop internationalized applications in these locales on the Tru64 UNIX operating system. Details of the language features are also documented:

- *Technical Reference for Using Chinese Features*

- *Technical Reference for Using Japanese Features*
- *Technical Reference for Using Korean Features*
- *Technical Reference for Using Thai Features*

3.3.13 X Window System Documentation

The documentation described in this section pertains to X Windows System, Version 11, Release 6. These documents are provided by the X Consortium.

- *Inter-Client Communication Conventions Manual*
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 Intrinsic — C Language Interface*
Intrinsics are a programming library tailored to the special 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*
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*
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.
- *X Window System Protocol*
This document describes the X Window System protocol.
- *X Window System: The Complete Reference to Xlib, X Protocol, ICCCM, XFLD*
This 1000–page manual describes the features of the X Window System Version 11, Release 5. It was written by Robert W. Scheifler and James Gettys, who were on the team that designed X Window System, and was originally published by Digital Press.

3.4 Operating System CD-ROM

The documentation described in the following sections is included on the Tru64 UNIX Operating System CD-ROM. Some of this documentation is available only when you install the software it describes.

3.4.1 Software Product Descriptions

A Software Product Description (SPD) is the legal description of the Tru64 UNIX product. It describes the software and gives information about its capabilities and about the hardware it supports.

PostScript versions of the SPDs are located on the CD-ROM in the *mount_point*/DOCUMENTATION/POSTSCRIPT directory. The files are named as follows:

```
Tru64_UNIX_Operating_System_SPD.ps
Tru64_UNIX_Developers_Extensions_SPD.ps
Tru64_UNIX_Server_Extensions_SPD.ps
Tru64_UNIX_Logical_Storage_Manager_SPD.ps
```

PDF versions of the SPDs are located on the CD-ROM in the *mount_point*/DOCUMENTATION/ACRO directory. You view PDF files using the Adobe Acrobat Reader. The files are named as follows:

```
Tru64_UNIX_Operating_System_SPD.pdf
Tru64_UNIX_Developers_Extensions_SPD.pdf
Tru64_UNIX_Server_Extensions_SPD.pdf
Tru64_UNIX_Logical_Storage_Manager_SPD.pdf
```

3.4.2 Listings of Patches to the Operating System

Listings of fixes (usually called patches) that Compaq has made to each version of the Tru64 UNIX operating system are provided in text files on the CD-ROM in the *mount_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
DIGITAL_UNIX_V4_0E_CLD_Fixes.txt
DIGITAL_UNIX_V4_0F_CLD_Fixes.txt
```

3.4.3 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/share/doclib/xie* directory.

Before you can view or print a copy of one of the XIE documents, you must uncompress it using the `gunzip` command. For information about `gunzip`, see the `gzip(1)` reference page.

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

- *X Image Extension Overview* (`overview.ps.gz`)
This document provides general information about the X Image Extension code. The topics covered include XIE design goals, XIE historical summary, XIE architecture, element definitions, and subsetting.
- *XIELib Specification* (`xielib.ps.gz`)
This document 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* (`xieSIarch.ps.gz`)
This document 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* (`XIEProto.ps.gz`)
This document specifies the X wire protocol for XIE. It defines the syntax, structure, and semantics of the XIE protocol elements. The 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.

3.5 Associated Products CD-ROMs

The Associated Products CD-ROMs contain documentation for various components of the Tru64 UNIX operating system and for several separately licensed layered applications (see Section 1.5). The document called *Tru64 UNIX Version 4.0G CD-ROMs* provides a list of the applications located on these CDs, as do the `00README.TXT` files located on the CDs.

Both CDs provide 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.

The Tru64 UNIX Reference Pages

The Tru64 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 the `webman` utility to read the reference pages on line using your Web browser, 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.

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

Your system administrator also decides whether to install the reference pages that are included with layered products. This includes products such as the TruCluster Server, which provides a full set of its own reference pages.

4.1.1 Using the Documentation CD-ROM

The Documentation CD-ROM contains the full set of base operating system reference pages in HTML form. You can view these references pages with your Web browser just as you would any of the HTML books.

These references pages are indexed for AltaVista searches and hot-linked with each other and with the books so you can easily move from one to the other. (Reference pages for layered products are not included on the CD-ROM.)

4.1.2 Using `webman`

The Documentation CD-ROM contains the `webman` viewer, a UNIX CGI program you can use with your browser to view the reference pages that are installed with the operating system.

The `webman` viewer is most useful when the Documentation CD-ROM is not mounted, or when you need to access reference pages that have been

installed with layered applications. For information about installing and using `webman`, see the following file on the Documentation CD-ROM:

```
/mount-point/DOCS/HTML/webman/Installing_webman.txt
```

See Section 1.3.1.1 for information about the Documentation CD-ROM.

4.1.3 Using the `xman` Command

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.

4.1.4 Using the `man` 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, enter the following command:

```
% man man
```

4.2 Reading Reference Pages in Printed Books

Compaq 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. The books contain an R on the spines to help you to quickly identify them as reference page books.

To order the Reference Page Kit, refer to Appendix A.

Note

The Reference Page Kit is usually updated only with major releases of Tru64 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 Tru64 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 Tru64 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 is in one volume.

Reference Pages Section 3

Section 3 describes the routines available in Tru64 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 Sections 8 and 1m

Sections 8 and 1m describe commands for system operation and maintenance. These are for system administrators.

In printed format, these sections are divided into two volumes.

Device Driver Documentation

The Tru64 UNIX Device Driver Kit (DDK) provides programming information specifically for system engineers who are developing device drivers for the Tru64 UNIX operating system.

This kit includes printed versions of the device driver documentation and a CD-ROM that provides driver development tools, device driver examples, X Consortium code, white papers, and HTML and PDF versions of the device driver documentation.

In printed form, the spines of the device driver books are identified with a D icon on the spine to help you find them quickly.

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 Tru64 UNIX documentation set.

Note

The Device Driver Kit is produced independently of the Tru64 UNIX operating system. The following descriptions are for Release 1 (June 1997) of the kit. For information about the DDK, visit the following Web site:

http://www.tru64unix.compaq.com/faqs/publications/pub_page/devdoc_list.html

Writing Device Drivers: Tutorial

This manual provides information for systems engineers who write device drivers for hardware that runs the Tru64 UNIX operating system. Systems engineers can find information on device driver concepts, interfaces, and configurations, as well as summary information about kernel interfaces, kernel data structures, and header files related to device drivers. (See the manual *Writing Device Drivers: Reference* for complete descriptions of these concepts).

This manual also provides a glossary of device driver terms.

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 additional summary information about kernel interfaces and data structures, header files, global variables, and `ioctl` commands. (See the manual *Writing Device Drivers: Reference* for complete descriptions of these concepts).

Writing Device Drivers: Reference

This manual contains detailed descriptions of the header files, kernel interfaces, `ioctl` commands, global variables, 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, kernel interfaces, 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, kernel interfaces, 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 Tru64 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 and data structures 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, kernel interfaces, and data structures that VMEbus device drivers use. A VMEbus device driver example show the use of these interfaces.

Writing Network Device Drivers

This manual introduces driver writers to topics that are specific to writing a device driver for a local area network (LAN) device.

Writing a Graphics Device Driver and DDX for the Tru64 UNIX X Server

This manual describes how to add graphics device support to the X Window system on systems running the Tru64 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 product kit. A kit is the standard mechanism by which layered product modifications are delivered and maintained on a Tru64 UNIX operating system. Kits are distributed on CD-ROM, diskettes, or tape for installation on customers' systems.

This is the same manual that is included in the Programmer's Kit of the Tru64 UNIX documentation set.

Installation Instructions and Release Notes

This document provides instructions for installing the DDK components: online documentation, example files and the development tool, and the X Developer's Kit. It also provides product release notes.

A

How to Order Tru64 UNIX Documentation

To order Tru64 UNIX documentation in the United States and Canada, call **800-344-4825**. In Puerto Rico, call **787-781-0505**. In other countries, contact your local Compaq subsidiary.

If you have access to Compaq's intranet, you can place an order at the following Web site:

<http://asmorder.nqo.dec.com/>

Table A-1 provides the order number for the Tru64 UNIX Documentation CD-ROM and the kits containing the printed documentation. (The indentation indicates which kits are included in those above them. For example, the Tru64 UNIX Documentation Kit contains all of the kits listed below it.)

Table A-1: Tru64 UNIX Documentation Kits and CD-ROM

Documentation Kit	Order Number
Tru64 UNIX Documentation CD-ROM	QA-MT4AA-G8
Tru64 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
General Programming Documentation Kit	QA-MT5AB-GZ
Windows Programming Documentation Kit	QA-MT5AC-GZ
Reference Pages Documentation Kit	QA-MT4AG-GZ

Index

A

Advanced Printing Software
 books packaged with software, 3–3
 User Guide, 3–2
Advanced Server for UNIX
 (*See* ASU)
AdvFS
 documentation for separately
 licensed utilities, 1–8
 solutions to potential problems
 with, 2–2
AdvFS Guide to File System
 Administration manual, 3–2
applications
 (*See* layered applications)
archived versions of Tru64 UNIX
 manuals
 (*See* previous versions of Tru64
 UNIX manuals)
Assembly Language Programmer's
 Guide, 2–9
Associated Products CD-ROMs
 documentation for separately
 licensed products, 1–8
 supplementary documentation on,
 3–8
ASU
 documentation for, 1–8
 viewing documentation on the Web,
 1–6
Asynchronous Transfer Mode manual,
 2–9

B

best practices, 3–1
BIND
 (*See* Name Server Operations
 Guide for BIND)

C

calling standard
 (*See* Tru64 UNIX Calling
 Standard for Alpha Systems
 manual)
CD-ROM
 (*See* Associated Products
 CD-ROMs, Documentation
 CD-ROM)
CD-ROMs
 contents of, 2–3
CDE Companion, 2–4
changes to operating system
 (*See* operating system)
changes to the documentation in this
 version, 1–2
Chinese
 (*See* Technical Reference for
 Using Chinese Features)
CLD
 (*See* patches to operating
 system)
color coding
 to identify documentation sets, 1–8
Command and Shell User's Guide,
 2–4

Common Desktop Environment:
 Advanced User's and System
 Administrator's Guide, 2-4

Common Desktop Environment:
 Application Builder User's Guide,
 2-13

Common Desktop Environment:
 Desktop KornShell User's Guide,
 2-13

Common Desktop Environment: Help
 System Author's and Programmer's
 Guide, 2-14

Common Desktop Environment:
 Internationalization Programmer's
 Guide, 2-14

Common Desktop Environment:
 Product Glossary, 2-15

Common Desktop Environment:
 Programmer's Guide, 2-14

Common Desktop Environment:
 Programmer's Overview, 2-14

Common Desktop Environment: Style
 Guide and Certification Checklist,
 2-14

Common Desktop Environment:
 ToolTalk Messaging Overview,
 2-15

Common Desktop Environment:
 User's Guide, 2-5

Compaq C Language Reference
 Manual, 2-10

revised for Version 4.0G, 1-2

Compaq Safety & Comfort Guide, 3-3

core documentation

defined, 1-1

overview of manuals in, 2-1

viewing on World Wide Web, 1-5

D

DDK
 (*See* device driver
 documentation)

debugging
 (*See* Kernel Debugging manual,
 Ladebug Debugger Manual)

DEC C Language Reference Manual
 (*See* Compaq C Language
 Reference Manual)

DEC C++
 (*See* layered applications)

DECEvent Translation and Reporting
 Utility manual, 2-6

DECthreads
 (*See* Guide to DECthreads)

DECwindows Companion to the
 OSF/Motif Style Guide, 3-3

DECwindows development
 supplementary documentation for,
 3-3

DECwindows Extensions to Motif
 manual, 3-3

DECwindows Motif Guide to
 Application Programming, 3-3

DECwindows User's Guide, 2-5

developer's documentation

described, 1-7

order number for, A-1t

overview of kits comprising, 2-9

device driver documentation

books in set described, 5-1

kit for, 5-1

viewing documentation on the Web,
 1-6

Device Driver Kit
 (*See* device driver
 documentation)

Digital Portable Mathematics Library
 manual, 2-10

disk-space requirements

information on in Release Notes,
 2-2

Documentation CD-ROM

core documentation on, 2-1

described, 1-4

mounting, 1-5

order number for, A-1

supplementary documentation on,
3-2
documentation kits
(*See* Tru64 UNIX
Documentation Kit)
documentation library
(*See* online Documentation
Library)
documentation update contract, 1-3

E

end user documentation
described, 1-7
order number for, A-1t
overview of kits comprising, 2-1

F

factory installed software
(*See* FIS)
features of operating system
(*See* operating system)
FIS
documentation included on, 1-3
foreign language
(*See* non-English environments)

G

general programming documentation
described, 1-8
manuals comprising kit, 2-9
order number for kit, A-1t
general user documentation
category in online Documentation
Library, 1-4
described, 1-7
manuals comprising kit, 2-4
order number for kit, A-1t
Guide to DECthreads, 2-11

Guide to Preparing Product Kits,
2-11, 5-3
Guide to Prestoserve, 2-6
Guide to Realtime Programming,
2-11

H

HTML
(*See* Netscape browser)

I

I18N
(*See* Writing Software for
the International Market
manual)
icon
(*See* spine icon)
Installation Guide
on FIS system, 1-3
overview of, 2-1
Installation Instructions and Release
Notes for Device Driver Kit, 5-3
internationalization
(*See* Writing Software for
the International Market
manual)

J

Japanese
(*See* Technical Reference for
Using Japanese Features)
Java
documentation for, 3-4
JDK
(*See* Java)

K

Kernel Debugging manual, 2-6

Korean
(*See* Technical Reference for
Using Korean Features)

L

Ladebug Debugger Manual, 2–11
layered applications
 available on CD-ROMs, 1–9
 defined, 1–2
 documentation for, 1–8
 online documentation for, 1–9
 using webman viewer for
 product-specific reference
 pages, 4–1
Logical Storage Manager manual, 2–6
LSM
(*See* Logical Storage Manager
manual)

M

man command, 4–2
manpage
(*See* reference pages)
master index, 2–5
media kit
 documentation in, 1–3
media update contract, 1–3
Motif
 documentation for programmers,
 3–3
 documentation for users, 2–4

N

Name Server Operations Guide for
BIND, 3–4
Netscape browser
 instructions for installing and
 configuring, 2–2
 using to read HTML files, 1–4
Netscape FastTrack Server

 instructions for installing and
 configuring, 2–2
Network Administration manual
 on FIS system, 1–3
 overview of, 2–7
Network Programmer's Guide, 2–12
Network Programming
 revised for Version 4.0G, 1–2
new and changes features of operating
system
(*See* operating system)
non-English environments, 3–5

O

ONC RPC
(*See* Programming with ONC
RPC manual)
online Documentation Library
 structure of, 1–4
Open Source Internet Solutions for
Tru64 UNIX
 viewing documentation on the Web,
 1–6
operating system
 fixes to
 (*See* patches to operating
 system)
 new and changed features
 from prior releases, 3–4
 in current version, 2–2
Operating System CD-ROM
 supplementary documentation on,
 3–6
operating system subsets
 documentation for, 1–1
order numbers
 for Documentation CD-ROM, A–1
 for documentation kits, A–1t
ordering information, A–1
 file in Supplementary category, 3–4
OSF/Motif Programmer's Guide, 2–15
OSF/Motif Style Guide, 2–15

P

patches to operating system
 lists of for operating system
 versions, 3-7

PDF files, 1-4

Performance Manager manual, 3-4

Porting documentation, 1-6

POSIX conformance documentation,
 1-6

preferred methods for performing
 tasks
 (*See best practices*)

Prestoserve
 (*See Guide to Prestoserve*)

printed documentation
 (*See Tru64 UNIX
 Documentation Kit*)

Programmer's Guide, 2-12

Programmer's Guide: STREAMS,
 2-12

programming documentation
 (*See developer's
 documentation*)
 category in online Documentation
 Library, 1-4

Programming Support Tools manual,
 2-12

Programming with ONC RPC manual,
 2-13

purchasing information
 (*See ordering information*)

Q

Quick Reference Card, 2-1
 (*See also Update Installation
 Quick Reference Card*)

R

realtime programming

 (*See Guide to Realtime
 Programming*)

reference page
 overview of sections, 4-3

reference pages
 available as optional subsets, 1-1
 in printed books, 4-2
 on the Web, 1-6
 reading on line, 4-1
 webman viewer for, 4-1

Release Notes
 included in Technical Update on
 Web, 2-3n
 on FIS system, 1-3
 overview of, 2-2

retirement of features and interfaces,
 2-2

revised documentation, 1-2

S

Safety & Comfort Guide
 on FIS system, 1-3

Security manual
 on FIS system, 1-3
 overview of, 2-5

sendmail Installation and Operation
 Guide, 3-5

sendmail utility, 3-5

Sharing Software on a Local Area
 Network manual, 2-7

Software License Management
 manual, 2-7

Software Product Description
 location of, 3-7

SPD
 (*See Software Product
 Description*)

spine icon
 to identify device driver books, 5-1
 to identify documentation sets, 1-8

- to identify reference page books, 4-2
- startup documentation
 - described, 1-7
 - manuals comprising kit, 2-1
 - order number for kit, A-1t
 - printed versions in media kit, 1-3
- STREAMS
 - (*See* Network Programmer's Guide, Programmer's Guide: STREAMS)
- subsets
 - (*See* operating system subsets)
- supplementary documentation
 - AdvFS Guide to File System Administration manual, 3-2
 - category in online Documentation Library, 1-4
 - DECwindows development documentation, 3-3
 - defined, 1-2
 - Java documentation, 3-4
 - Name Server Operations Guide for BIND, 3-4
 - New and Changed Features from Prior Releases, 3-4
 - on associated products CD-ROMs, 3-8
 - on Documentation CD-ROM, 3-2
 - on Operating System CD-ROM, 3-6
 - overview of, 3-1
 - sendmail utility, 3-5
 - Software Product Descriptions, 3-7
 - ToolTalk service, 3-5
 - working in a non-English Environment, 3-5
 - X Image Extension, 3-7
 - X Window System, 3-6
- System Administration manual
 - on FIS system, 1-3
 - overview of, 2-7
- system and network management documentation

- category in online Documentation Library, 1-4
- described, 1-7
- manuals comprising kit, 2-6
- order number for kit, A-1t
- System Configuration and Tuning manual, 2-8
- System Configuration Supplement: OEM Platforms
 - described, 2-8
- System Configuration Supplement: OEM Platforms manual
 - new to docset, 1-2
- system limits
 - information on in Release Notes, 2-2
- System Tuning and Performance Management manual
 - (*See* System Configuration and Tuning manual)

T

- Technical Overview
 - on FIS system, 1-3
 - overview of, 2-3
 - revised for Version 4.0G, 1-2
- Technical Reference for Using Chinese Features, 3-5
- Technical Reference for Using Japanese Features, 3-6
- Technical Reference for Using Korean Features, 3-6
- Technical Reference for Using Thai Features, 3-6
- technical updates, 1-6
 - for Version 4.0G, 2-3n
- Thai
 - (*See* Technical Reference for Using Thai Features)
- threads
 - (*See* Guide to DECthreads)
- ToolTalk Reference Manual, 3-5
- ToolTalk service

documentation for, 3–5
ToolTalk User's Guide, 3–5
Tru64 UNIX Calling Standard for
Alpha Systems manual, 2–10
Tru64 UNIX Documentation Kit
books in, 2–1
order number for, A–1t
order number for subkits, A–1t
overview, 1–6
structure of, 1–6
Tru64 UNIX manuals
(*See core documentation*)
Tru64 UNIX Version 4.0G CD-ROMs
contents of, 2–3
TruCluster Server
viewing documentation on the Web,
1–6

U

ULTRIX to Tru64 UNIX Migration,
2–8
Update Installation Quick Reference
Card, 2–3
(*See also Quick Reference Card*)

W

Web
(*See World Wide Web*)
webman
(*See reference pages*)
windows programming documentation
described, 1–8
manuals comprising kit, 2–13
order number for kit, A–1t
World Wide Web
viewing Tru64 UNIX documentation
on, 1–5

Writing a Graphics Device Driver and
DDX for the Tru64 UNIX X Server,
5–3
Writing Device Drivers for the
SCSI/CAM Architecture Interfaces,
5–2
Writing Device Drivers: Advanced
Topics, 5–1
Writing Device Drivers: Reference,
5–2
Writing Device Drivers: Tutorial, 5–1
Writing EISA and ISA Bus Device
Drivers, 5–2
Writing Network Device Drivers, 5–3
Writing PCI Bus Device Drivers, 5–2
Writing Software for the International
Market manual, 2–13
Writing TURBOchannel Device
Drivers, 5–2
Writing VMEbus Device Drivers, 5–2
WWW
(*See World Wide Web*)

X

X Image Extension
supplementary documentation for,
3–7
X Window System
supplementary documentation for,
3–6
X Window System Administrator's
Guide, 2–8
X Window System Environment
manual, 2–9
XIE
(*See X Image Extension*)
xman command, 4–2

Reader's Comments

Tru64 UNIX

Documentation Overview
AA-QTM6C-TE

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Figures (useful)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Examples (useful)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Usability (ability to access information quickly)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please list errors you have found in this manual:

Page	Description
_____	_____
_____	_____
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_____	_____

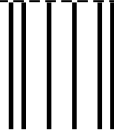
Additional comments or suggestions to improve this manual:

What version of the software described by this manual are you using? _____

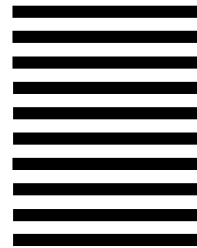
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