

# Tru64 UNIX

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## Documentation Overview

Part Number: AA-RH8RC-TE

**August 2000**

**Product Version:** Tru64 UNIX Version 5.1

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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## 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. For an overview of the major changes to the Version 5.1 documentation set, see *Section 1.2*.

Additionally, this book has been reorganized to speed up and simplify your search for the documentation that you need to perform your tasks. Chapter 2, Chapter 3, and Chapter 4 now reflect the structure of the Tru64 UNIX Documentation CD-ROM.

### Organization

This manual is organized as follows:

- Chapter 1* Provides general information about the Tru64 UNIX documentation set.
- Chapter 2* Describes the manuals and other documentation that are used by all users of the Tru64 UNIX operating system. The documents described in this chapter are packaged on the Documentation CD-ROM and in kits that contain printed documentation.
- Chapter 3* Describes the manuals and other documentation that are used by system and network administrators of the Tru64 UNIX operating system. The documents described in this chapter are packaged on the Documentation CD-ROM and in kits that contain printed documentation.

- Chapter 4* Describes the manuals and other documentation that are used by software developers who program on or for the Tru64 UNIX operating system. The documents described in this chapter are packaged on the Documentation CD-ROM and in kits that contain printed documentation.
- Chapter 5* Describes some additional documentation that is packaged on the Tru64 UNIX Operating System and Associated Products CD-ROMs. The documents described in this chapter are packaged on the Documentation CD-ROM and in kits that contain printed documentation.
- Chapter 6* 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 7* Describes the Device Driver Kit and the contents of the books in that kit.

## 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](mailto: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:

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 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.



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## 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 formats and is also available as 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 find the documentation you need, in the format that is most convenient to you.

### 1.1 Introduction to the Documentation Set

Tru64 UNIX is a feature-rich operating system designed to be used in many different types of computing environments. The components of the operating system range from those used by every user to those used by only a small handful of users.

Likewise, the documentation must serve many different users in different fields and with different levels of technical knowledge — from the novice general user, to the advanced system administrator or program developer.

The Tru64 UNIX documentation is organized according to whether it is used by all users, or specifically by system and network administrators and software programmers:

- General user documentation

This information is for all users of the Tru64 UNIX operating system. Examples include the *Master Index* and the *Release Notes*. Users of this information range from novice to advanced.

- System and network management documentation

This information is for those who install, configure, maintain, and troubleshoot the Tru64 UNIX operating system.

- Programming documentation

This information is for those who develop software on and/or for the Tru64 UNIX operating system.

Be aware, however, that some of this documentation is written to serve different audiences. For example, the *Security* manual is divided into three parts to provide guidance for individual users, system administrators, and programmers who must develop secure programs.

The following sections describe 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.

### 1.1.1 Core Documentation

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.

The core documentation is provided in printed and online formats and was created by Compaq writers who worked closely with the developers of the operating system to document the system's various components (except for a few externally published manuals).

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 as printed books in a multivolume kit.

For information about the core manuals and guides, see the "Printed and Online Documentation" sections of Chapter 2, Chapter 3, and Chapter 4. For information about the reference pages, see Chapter 6.

### 1.1.2 Supplementary Documentation

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.

Much of the supplementary documentation is provided on the Documentation CD-ROM, although some is packaged with the individual software subsets or in various directories on Tru64 UNIX media. For more information about the supplementary documentation on the Documentation CD-ROM, see the "Online Documentation" sections of the following chapters. For information about other supplementary documentation, see Chapter 5.

### 1.1.3 Layered Applications

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 1.6.

## 1.2 Changes to the Version 5.1 Documentation Set

With this release of the Tru64 UNIX, the following documentation was revised. The changes were made to the printed books and their online versions.

- *Release Notes for Version 5.1*
- *Technical Overview*
- *Master Index*
- *Installation Guide*
- *Installation Guide — Advanced Topics*
- *Update Installation Quick Reference Card*
- *Full Installation Quick Start (card)*
- *System Administration*
- *Network Administration*
- *Network Programmer's Guide*
- *Security*
- *Logical Storage Manager*
- *Programmer's Guide*
- *Compaq C Language Reference Manual (formerly DEC C Language Reference Manual)*
- *Assembly Language Programmer's Guide*
- *Guide to Preparing Product Kits*
- *Writing Software for the International Market*
- *Calling Standard for Alpha Systems*
- *Asynchronous Transfer Mode*
- *AdvFS Administration*
- *System Configuration and Tuning*
- *Writing Kernel Modules*
- *Guide to Realtime Programming*

The following supplementary documents were revised for this release:

- *Ladebug Debugger Manual*
- *Technical Reference for Chinese Features*
- *Technical Reference for Japanese Features*
- *Technical Reference for Korean Features*
- *Performance Manager*
- *Object File and Symbol Table Format Specification*
- *Advanced Printing Software User Guide*
- *sendmail Installation and Operation Guide*

The following document is new with this release:

- *How to Access Tru64 UNIX Documentation*

This printed quick-reference card was added to help you navigate the Tru64 UNIX documentation.

Also new with this release is a new feature that lets you search the *Master Index* on the Online Documentation Library CD-ROM using a keyword search. To find out more about this feature, see the discussion of the *Master Index* in Chapter 2.

## 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 Section 1.5.
- If you purchase the Tru64 UNIX Documentation Kit, you receive printed versions of the books described in Section 1.5.
- 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 5.1*
  - *Installation Guide*

- *Installation Guide — Advanced Topics*
- *Security*
- *System Administration*
- *Network Administration*
- *Documentation Overview* (the book you are reading)
- *Safety & Comfort Guide*

## 1.4 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 1.4.2). 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 JavaScript 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.

### 1.4.1 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, or Windows NT Version 4.0.

The CD-ROM's online Documentation Library is arranged in 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 red 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* manual 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 6.

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.

## 1.4.2 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](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 5.1 for details)
- Tru64 UNIX Device Driver documentation library (See Chapter 7 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 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. Visit the following Web site to see the Technical Update for Version 5.1:

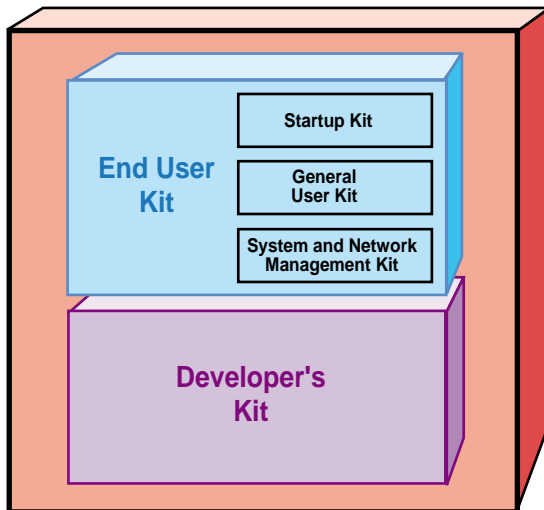
**<http://www.tru64unix.compaq.com/faqs/publications/updates/V51/TITLE.HTM>**

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

## 1.5 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. See the How to Order page at the back of this book for information about the part numbers for these kits.

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



The following list describes the kits that comprise the Tru64 UNIX Documentation Kit and the documentation that each kit contains. This documentation is also provided on line, except where indicated.

- End User Documentation Kit
  - This kit contains all the information needed to install, use, and administer 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.
      - This kit contains the following documentation:

*Release Notes for Version 5.1*  
*Tru64 UNIX Technical Overview*  
*Documentation Overview*  
*Installation Guide*  
*Installation Guide — Advanced Topics*  
*Full Installation Quick Start Card* (printed only)  
*Update Installation Quick Reference Card* (printed only)  
*Quick Reference Card* (printed only)  
*Tru64 UNIX Version 5.1 CD-ROMs* (printed only)

– **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.

This kit contains the following documentation:

*CDE Companion*  
*Command and Shell User's Guide*  
*Master Index*  
*Security*

– **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.

This kit contains the following documentation:

*AdvFS Administration*  
*Guide to Prestoserve*  
*Kernel Debugging*  
*Logical Storage Manager*  
*Network Administration*  
*Sharing Software on a Local Area Network*  
*Software License Management*  
*System Administration*  
*System Configuration and Tuning*  
*System Configuration Supplement: OEM Platforms*  
*X Window System Administrator's Guide* (printed only)  
*X Window System Environment*

• **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 contains the following documentation:

*Assembly Language Programmer's Guide*  
*Asynchronous Transfer Mode*  
*Calling Standard for Alpha Systems*

*Compaq C Language Reference Manual*  
*Compaq Portable Mathematics Library*  
*Guide to the POSIX Threads Library*  
*Guide to Preparing Product Kits*  
*Guide to Realtime Programming*  
*Network Programmer's Guide*  
*OSF/Motif Programmer's Guide* (printed only)  
*OSF/Motif Style Guide* (printed only)  
*Programmer's Guide*  
*Programmer's Guide: STREAMS* (printed only)  
*Programming Support Tools*  
*Programming with ONC RPC*  
*Writing Kernel Modules*  
*Writing Software for the International Market*

- Other documentation in the media kit

The following documentation is packaged in the Tru64 UNIX media kit, but is not included in any of the orderable documentation kits:

*How to Access Tru64 UNIX Documentation*  
*TruCluster Server Technical Overview*

The printed manuals include a letter icon on the spine to help you quickly find the book you are looking for. The following icons are used:

- G** Indicates books that are in the General User Documentation Kit
- S** Indicates books that are in the System and Network Management Documentation Kit
- P** Indicates books that are in the Developer's Documentation Kit (the P is for programmers)

Although a book's primary audience determines the documentation kit it is packaged in, some books help meet the needs of several audiences. For example, a general user can read the *Programming Support Tools* manual (packaged in the Developer's Documentation Kit) to get advanced information about using commands such as `grep` or `awk`. The *Security* manual (packaged in the General User Documentation Kit) provides information for system administrators and programmers, as well as for general users. Keep this in mind when searching for information on specific topics.

## 1.6 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.

### 1.6.1 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 5.1 CD-ROMs* sheet packaged with the Tru64 UNIX media for a complete list and the location of the layered applications included with Tru64 UNIX. See Section 5.3 for information about the Tru64 UNIX Associated Products CD-ROMs.

### 1.6.2 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.

### 1.6.3 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 7 for more information about the Device Driver Documentation Kit.



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## General User Documentation

This chapter describes the general user documentation, which provides 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, as well as advanced information for the experienced user. Each document is individually described.

Books that are printed can be purchased from Compaq in the documentation kits described in Section 1.5.

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.

Books identified as revised, were updated with the Version 5.1 release.

### 2.1 Printed and Online Documentation

The documentation described in this section is provided on the Tru64 UNIX Documentation CD-ROM and in the optional printed documentation kits. For more information on the printed documentation set, see Section 1.5.

Documentation that was revised for the Version 5.1 release is indicated in the section heads.

#### 2.1.1 *Release Notes for Version 5.1 (revised)*

The *Release Notes* 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 5.1 software
- Announcements about features and interfaces that are scheduled for removal in future versions of Tru64 UNIX
- Information about installing the software
- Information that is relevant to specific Compaq Alpha processors
- Information about the base operating system
- Information about the development environment
- Information about the graphical interfaces

- Additions and corrections to the books in the Tru64 UNIX documentation set
- Information about the contents of the media and disk-space requirements
- Information about changes to time zone directories and files

Compaq recommends that you read this information before installing or using the Tru64 UNIX operating system.

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**Note**

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Compaq maintains an online *Technical Update* that contains information about restrictions and problems that have been discovered since Version 5.1 began shipping. To view this document on the Web, go to the following URL:

**<http://www.tru64unix.compaq.com/faqs/publications/updates/V51/TITLE.HTM>**

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

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## 2.1.2 *Technical Overview (revised)*

The *Technical Overview* 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 follows:

- The various features available to system administrators
- The available networking protocols and applications
- The supported file systems
- The Tru64 UNIX kernel, symmetric multiprocessing, virtual memory, and device recognition
- Major features of the Tru64 UNIX development environment
- Tru64 UNIX interoperability with Windows NT and Windows 2000
- Tru64 UNIX security
- Issues concerning internationalization

Because this book might introduce new terms to you, it contains the *Glossary of Common UNIX and General Computer Terms*. 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.



### 2.1.3 TruCluster Server (revised) *Technical Overview*

The TruCluster Server *Technical Overview* describes the major components of the TruCluster Server product. The opening chapter introduces the features of a TruCluster Server cluster and compares them to those provided in earlier products in the TruCluster Software family. Subsequent chapters provide a more in-depth discussion of certain features, including:

- Clusterwide file systems, storage, and device names
- The connection manager
- Highly available applications
- The cluster application availability (CAA) component
- The cluster alias subsystem
- The cluster interconnect
- The distributed lock manager (DLM)

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**Note**

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This book is packaged with the Tru64 UNIX operating system media, but is not included in any of the Tru64 UNIX documentation kits. It is, however, included in the TruCluster Server documentation kit.

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### 2.1.4 *CDE Companion*

The *CDE Companion* 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 into the system, navigating the system, and using and managing the desktop and applications.

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

### 2.1.5 *Command and Shell User's Guide*

The *Command and Shell User's Guide* 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.

### **2.1.6 *Documentation Overview (revised)***

The document you are currently reading.

### **2.1.7 *Master Index (revised)***

The *Master Index* 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 of this book, 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 a few other books, clicking on the index item will take you only to the beginning of the appropriate book, where you can then use the table of contents or the book's index to find out where the topic is discussed.

Beginning with the Version 5.1 release, you can search the *Master Index* using a keyword search. The *Master Index* listing of the Online Documentation Library provides the access to the search utility. When you type the word or phrase you want to find, the search utility searches all of the *Master Index* entries for matches and then displays the results. When you click on an entry in the search results, the target book opens in its own window — in most cases to the place in the text that is indicated by the entry. Figure 2-1 shows the result of a search on the text string “bsd.”

**Figure 2–1: Example Master Index Search**

bridging drivers	BSD drivers to STREAMS protocol stack	<a href="#">NetProgGde (Sec. 8.2)</a>
BSD driver	bridging to STREAMS protocol stack	<a href="#">NetProgGde (Sec. 8.2)</a>
BSD socket		<a href="#">NetProgGde (Sec. 4.4)</a>
BSD socket	and network addresses	<a href="#">NetProgGde (Sec. 4.4.1)</a>
driver	bridging BSD driver to STREAMS protocol stack	<a href="#">NetProgGde (Sec. 8.2)</a>
sockets	BSD	<a href="#">NetProgGde (Sec. 4.4)</a>
STREAMS protocol stack	bridging to BSD driver	<a href="#">NetProgGde (Sec. 8.2)</a>

In both the online and printed versions, the entries also provide section numbers, to help you further refine your search.

### 2.1.8 Security (revised)

The *Security* manual describes how to use, administer, and write programs for the Tru64 UNIX operating system with the optional enhanced security subsets installed. It also provides information about traditional UNIX security and other optional security features.

When the enhanced security subset is installed and configured, the system is referred to as a trusted system. The enhanced security features result in a system that can be configured to meet the C2 and F-C2 security classes.

The information is organized as follows:

- Part 1 is aimed at general users. It introduces the enhanced security features and helps users to start using them. Other topics include the following:
  - How to connect to other systems
  - Using the security features of the Common Desktop Environment (CDE)
  - Using access control lists (ACLs) on files and directories
- Part 2 describes how to set up and administer the operating system's enhanced security, which includes enhanced passwords and the audit subsystem. Topics in this part include the following:
  - Creating and modifying secure devices
  - Creating and maintaining accounts
  - Administering the audit subsystem

- Administering ACLs
- Ensuring authentication database integrity
- Working within the framework of the Security Integration Architecture (SIA) layer
- Troubleshooting a trusted system
- 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. Topics in this part include the following:
  - Using the security information stored in the authentication database
  - Using the per-process audit ID (AUID), which is unique to Tru64 UNIX
  - The mechanics of writing and reading audit records
  - Using the Security Integration Architecture (SIA) interfaces
  - Programming with ACLs

## 2.2 Printed-Only Documentation

The documentation described in this section is provided only in print. This documentation is included in the Tru64 UNIX documentation kits.

### 2.2.1 *Quick Reference Card*

The *Quick Reference 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.

### 2.2.2 *How to Access Tru64 UNIX Documentation (new)*

The Tru64 UNIX documentation is available to you whether you are working in your office or on the road — on an Alpha system, PC, or other system.

The card titled *How to Access Tru64 UNIX Documentation* provides a brief overview of the various ways available to you to find and access the information you need, including the Tru64 UNIX reference pages. It also lists the documentation included in the printed documentation kits.

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**Note**

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This book is packaged with the Tru64 UNIX operating system media, but is not included in any of the Tru64 UNIX documentation kits.

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### **2.2.3 Tru64 UNIX Version 5.1 CD-ROMs (revised)**

The document titled *Tru64 UNIX Version 5.1 CD-ROMs* provides a brief listing of the components on the CD-ROMs in the Tru64 UNIX media kit.

## **2.3 Online-Only Documentation**

The documentation described in this section is provided on the documentation CD-ROM.

### **2.3.1 New and Changed Features from Previous Releases (revised)**

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

### **2.3.2 Advanced Printing Software User Guide (revised)**

The Advanced Printing Software *User Guide* 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 kit, as is the following companion documentation:

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

### **2.3.3 Common Desktop Environment: User's Guide**

The *Common Desktop Environment: User's Guide* 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.

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

The *Common Desktop Environment: Advanced User's and System Administrator's Guide* describes how to customize the appearance and behavior of the CDE. It provides information on topics such as the following:

- Customizing system initialization, log in, 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.

### **2.3.5 How to Order Tru64 UNIX Documentation**

The file titled *How to Order Tru64 UNIX Documentation* duplicates the "how-to-order" information provided at the back of the printed Tru64 UNIX manuals. It provides information about ordering documentation and lists the order numbers for documentation kits.

### **2.3.6 Safety & Comfort Guide**

The *Safety & Comfort Guide* describes how to 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.

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## System and Network Management Documentation

This chapter describes the Tru64 UNIX system and network management documentation, which provides information on topics such as configuring systems and networks, maintaining disks, and using system administration tools. The books in this category are generally geared toward advanced users. Each document is individually described.

Books that are printed can be purchased from Compaq in the documentation kits described in Section 1.5.

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.

Books identified as revised, were updated with the Version 5.1 release.

### 3.1 Printed and Online Documentation

The documentation described in this section is provided on the Tru64 UNIX Documentation CD-ROM and in the optional printed documentation kits. For more information on the printed documentation set, see Section 1.5.

Documentation that was revised for the Version 5.1 release is indicated in the section heads.

#### 3.1.1 *Installation Guide* (revised)

The *Installation Guide* describes how to install the Tru64 UNIX Version 5.1 operating system on all supported systems. Topics include preparing your system for an installation, booting the system from the distribution media, and performing the Full and Update Installation procedures on all supported processors.

Other topics include the following:

- The system management applications to use in setting up services following a Full Installation
- An overview of ways to manage software
- An overview of the Tru64 UNIX mandatory and optional subsets

- The Tru64 UNIX device naming conventions
- An overview of the processes for installing associated products
- An overview of the installation log files, which capture the screen output and processing of Full, Update, and Cloned installations

This manual is intended for anyone who is installing or updating the operating system software or the Worldwide Language Support (WLS) software.

### **3.1.2 *Installation Guide — Advanced Topics (revised)***

The *Installation Guide — Advanced Topics* manual describes advanced installation procedures for the Tru64 UNIX operating system. Topics include the following:

- Performing an Update or Full Installation from a Remote Installation Services (RIS) server
- Adding support for additional languages (Worldwide Language Support software subsets) after the base operating system is installed
- Using the UNIX shell to perform disk and file system maintenance before or during a Full Installation.
- Using the built-in disk planning features of the Full Installation process
- Installing and updating product kits
- Customizing the Installation process
- Duplicating the installation and configuration characteristics of a running system onto one or more systems using the Installation Cloning and Configuration Cloning processes

This manual is intended for experienced installers who want to take advantage of the wide range of advanced installation features.

### **3.1.3 *Network Administration (revised)***

The *Network Administration* manual is divided into two parts:

- Part 1 describes the tasks for configuring your system to operate in a network, for configuring the network services, and for day-to-day management of the network, network interfaces, and network services.
- Part 2 provides information for solving problems that might arise while using the network and network services.

The topics discussed include the following:

- Basic network connections



- The Asynchronous Transfer Mode (ATM) network environment, and how to configure and manage the ATM subsystem
- The Dynamic Host Configuration Protocol (DHCP) on Tru64 UNIX systems, ways to configure a DHCP server, and how to manage DHCP client addressing
- How to implement and configure point-to-point connections using the Serial Line Internet Protocol (SLIP) and the Point-to-Point Protocol (PPP)
- How to implement, configure, and manage the Local Area Transport (LAT) protocol
- How to configure and maintain the Domain Name Service (DNS) and the Network Information Service (NIS)
- How to configure and manage the Network File System (NFS)
- Using the UNIX-to-UNIX Copy Program (UUCP)
- The components of the Tru64 UNIX Network Time Protocol (NTP), and how to configure and maintain them
- The components of the Tru64 UNIX mail system, and how to configure and maintain them
- The Simple Network Management Protocol (SNMP) implementation on a Tru64 UNIX system.

This manual is intended for system and network administrators who are responsible for configuring and managing network services, and who are knowledgeable about operating system concepts, commands, and configuration. They should also have knowledge of Transmission Control Protocol/Internet Protocol (TCP/IP) networking concepts and network configuration; this manual is not a TCP/IP networking tutorial.

#### **3.1.4 System Administration (revised)**

The *System Administration* 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.

System administrators are provided with overviews of administrative concepts, as well as step-by-step instructions to perform necessary tasks using either the SysMan graphical interface or the command-line tools.

The topics discussed include the following:

- System administration methods and utilities
- Shutting down and starting up a system

- Customizing the system environment
- Configuring the kernel
- Managing hardware
- Administering file systems
- Administering user accounts and groups
- Administering the print services
- Administering the archiving services
- Administering the system accounting services
- Monitoring and testing the system
- Monitoring and administrating system events
- Administering crash dumps

This manual is for system administrators responsible for managing the operating system. It assumes the reader is knowledgeable about operating system concepts and commands, as well as supported hardware and software configurations. Administrators should know the operational aspects of UNIX system administration and be familiar with all the procedures necessary to maintain a UNIX system for high availability. This manual is not intended to train administrators or to plan the installation of a UNIX system.

### **3.1.5 *AdvFS Administration (revised)***

The *AdvFS Administration* manual provides task-based information and instruction on using, configuring, troubleshooting, tuning, and administering AdvFS base and utilities functions.

AdvFS is the default file system 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.

### **3.1.6 *System Configuration and Tuning (revised)***

The *System Configuration and Tuning* manual describes how to plan, 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:

- Monitoring systems and diagnosing performance problems
- Configuring and tuning a system that will meet current and future needs

- Tuning system resource limits (such as the size of system tables and the virtual address space) that were set at boot time
- Understanding how hardware, operating system subsystems, and layered applications interact to affect system performance
- Managing the performance of memory, the CPU, disk storage, file systems, and networks

### **3.1.7 Logical Storage Manager (revised)**

The Logical Storage Manager (LSM) software provides high data availability, better performance, and greater storage management flexibility through online support for disk storage devices on Alpha systems.

The *Logical Storage Manager* manual explains LSM concepts and how to install and administer the LSM software.

The following topics are among those discussed:

- Encapsulating and mirroring the boot disk
- Creating and configuring LSM volumes and disks
- Using LSM commands to manage LSM objects such as disks, disk groups, volumes, plexes, and subdisks
- LSM-related preventative maintenance procedures that enable administrators to restore the LSM configuration if a disk or system fails
- Troubleshooting the LSM software
- Using the Storage Administrator graphical interface to manage LSM objects such as disks, disk groups, volumes, plexes, and subdisks

This manual is intended for system administrators who need to configure and maintain disk storage under the control of the LSM software. It assumes the reader has a working knowledge of the operating system, a basic understanding of system administration, and a basic understanding of disk structures.

### **3.1.8 X Window System Environment**

The *X Window System Environment* 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.

### **3.1.9 Kernel Debugging**

The *Kernel Debugging* manual describes using the `dbx`, `kdbx`, and `kdebug` debuggers to diagnose 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 programmers who write programs that are built as part of the kernel and that references kernel data structures. It is also intended for system administrators who are responsible for managing the operating system. To understand and use the information in this manual, system programmers and administrators should have in-depth knowledge of operating system concepts, commands, and utilities.

### **3.1.10 Sharing Software on a Local Area Network**

The *Sharing Software on a Local Area Network* 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. RIS topics discussed in this manual include the following:

- Preparing and configuring a RIS server
- Booting a RIS client
- Managing RIS clients and environments
- Managing A RIS profile set
- Troubleshooting a RIS system

DMS allows a server system to maintain the `root`, `/usr`, and `/var` file systems for client systems. Each client computer has its own root file system on the server, but clients share the `/usr` and `/var` file systems. DMS topics discussed in this manual include the following:

- Setting up and configuring a DMS environment
- Managing DMS clients and environments
- Troubleshooting DMS

### **3.1.11 Software License Management**

The *Software License Management* 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.

The LMF software is designed to be used by companies other than Compaq. Those companies can issue Product Authorization Keys (PAKs) or have Compaq issue them on their behalf. Additionally, other companies can include license-checking functions in their software. However, the *Software License Management* manual addresses only software that is supplied and produced by Compaq.

### **3.1.12 System Configuration Supplement: OEM Platforms**

The *System Configuration Supplement: OEM Platforms* 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.

### **3.1.13 Guide to Prestoserve**

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

*The Guide to Prestoserve* describes how to manage and maintain a Tru64 UNIX system that includes the optional Prestoserve hardware and software.

## **3.2 Printed-Only Documentation**

The documentation described in this section is provided only in print. This documentation is included in the Tru64 UNIX documentation kits.

### **3.2.1 Full Installation Quick Start (revised)**

The *Full Installation Quick Start* card describes the basic steps for performing a Full Installation of the Tru64 UNIX operating system from the installation CD-ROM. It walks you through the process of performing preinstallation tasks, installing the operating system, and setting up services.

Users of this card are assumed to have a working knowledge of the Tru64 UNIX operating system and to have previously performed a Full Installation. First-time installers are urged to follow the more detailed instructions provided in the *Installation Guide*.

### **3.2.2 Update Installation Quick Reference Card (revised)**

The *Update Installation Quick Reference Card* describes the basic steps for upgrading your Tru64 UNIX operating system from Version 4.0G or 5.0A to Version 5.1 from the installation CD-ROM or from a Remote Installation Services (RIS) server. Update installations preserve disk partitions, file systems, and file customizations.

Users of this card are assumed to have a working knowledge of the Tru64 UNIX operating system and to have previously performed an Update Installation. Users who are performing their first Update Installation are urged to follow the more detailed instructions provided in the *Installation Guide*.

### **3.2.3 X Window System Administrator's Guide**

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

## **3.3 Online-Only Documentation**

The documentation described in this section is provided on the documentation CD-ROM.

### **3.3.1 BIND Configuration File Guide**

The *BIND Configuration File Guide* describes the Berkeley Internet Name Domain (BIND) Version 8 and its implementation as an Internet name server for BSD-derived operating systems.

Version 8 is more configurable than previous releases of BIND; there are entirely new areas of configuration, such as access control lists and categorized logging. Also, you can now selectively use many options that previously applied to all zones. These features, plus a consideration of future configuration needs, led to the creation of a new configuration file format.

### **3.3.2 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.

The *DECEvent Translation and Reporting Utility* 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.

### **3.3.3 *Performance Manager (revised)***

Performance Manager is a real-time performance management tool 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.

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

### **3.3.4 *sendmail Installation and Operation Guide (revised)***

The *sendmail Installation and Operation Guide* describes the configuration file for Version 8.9 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.





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## Programming Documentation

This chapter describes the documentation designed for software developers who write applications on or for the Tru64 UNIX operating system. The books in this category are generally geared toward advanced users. Each document is individually described.

Books that are printed can be purchased from Compaq in the documentation kits described in Section 1.5.

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.

Books identified as revised, were updated with the Version 5.1 release.

### 4.1 Printed and Online Documentation

The documentation described in this section is provided on the Tru64 UNIX Documentation CD-ROM and in the optional printed documentation kits. For more information on the printed documentation set, see Section 1.5.

Documentation that was revised for the Version 5.1 release is indicated in the section heads.

#### 4.1.1 *Assembly Language Programmer's Guide (revised)*

The *Assembly Language Programmer's Guide* 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.

#### 4.1.2 *Asynchronous Transfer Mode (revised)*

The *Asynchronous Transfer Mode* 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.

### **4.1.3 *Calling Standard for Alpha Systems (revised)***

The *Calling Standard for Alpha Systems* 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.

### **4.1.4 *Compaq C Language Reference Manual (revised)***

The *Compaq C Language Reference 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*.

### **4.1.5 *Compaq Portable Mathematics Library***

The *Compaq Portable Mathematics Library* provides reference and exception information for the Compaq Portable Mathematics Library (CPML) software.

This manual documents the CPML 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 CPML routines in their language of choice, but instead need to access CPML routines directly from application programs.

#### **4.1.6 *Guide to the POSIX Threads Library***

The *Guide to the POSIX Threads Library* (formerly called *Guide to DECThreads*) provides usage and reference information on POSIX Threads Library routines. It provides information on the three POSIX Threads Library 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.

#### **4.1.7 *Guide to Preparing Product Kits (revised)***

The *Guide to Preparing Product Kits* 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 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 Tru64 UNIX Device Drivers Kit (see Chapter 7).

#### **4.1.8 *Guide to Realtime Programming (revised)***

The *Guide to Realtime Programming* 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.

#### **4.1.9 *Network Programmer's Guide (revised)***

The *Network Programmer's Guide* describes the Tru64 UNIX network programming environment. It provides an in depth description of 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.

#### **4.1.10 *Programmer's Guide (revised)***

The *Programmer's Guide* 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.

#### **4.1.11 *Programming Support Tools***

The *Programming Support Tools* 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.

#### **4.1.12 *Programming with ONC RPC***

The *Programming with ONC RPC* 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.

#### **4.1.13 *Writing Kernel Modules (revised)***

Kernel modules are binary images containing code and data structures that run in the UNIX kernel. These modules provide a level of common code that improves the efficiency of a system by combining like tasks in a single area and eliminating redundant code.

The *Writing Kernel Modules* manual provides information for developers who want to augment the kernel with modules tailored to their particular environment.

#### **4.1.14 *Writing Software for the International Market (revised)***

Internationalization (often called I18N) is the process of designing or adapting programs to interact with users in their own language and to reflect the culture of the user's region.

The *Writing Software for the International Market* manual provides an overview of internationalization concepts. It also provides details about writing internationalized programs, creating and using message catalogs, and developing or customizing locales.

This manual is for programmers developing internationalized applications for the Tru64 UNIX operating system.

## **4.2 Printed-Only Documentation**

The documentation described in this section is provided only in print and is included in the Tru64 UNIX documentation kits.

### **4.2.1 *OSF/Motif Programmer's Guide***

The *OSF/Motif Programmer's Guide* (produced 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.

### **4.2.2 *OSF/Motif Style Guide***

The *OSF/Motif Style Guide* (produced 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.

### **4.2.3 Programmer's Guide: STREAMS**

The *Programmer's Guide: STREAMS* (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.

## **4.3 Online-Only Documentation**

The documentation described in this section is provided on the documentation CD-ROM.

### **4.3.1 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* 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.

### **4.3.2 Ladebug Debugger Manual (revised)**

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.

The *Ladebug Debugger Manual* is for developers who need to debug multiprocess and multithreaded applications, perform kernel debugging, and perform remote client/server debugging.

#### **4.3.3 Object File and Symbol Table Format Specification (revised)**

The *Object File and Symbol Table Format Specification* provides technical information for compiler and debugger writers and other developers who must access or manipulate object files on the Tru64 UNIX operating system. It supplements or replaces information that has been previously available in the Assembly Language Programmer's Guide. A familiarity with basic program development and symbol table concepts is assumed.

#### **4.3.4 Common Desktop Environment: Application Builder User's Guide**

The *Common Desktop Environment: Application Builder User's Guide* 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.

#### **4.3.5 Common Desktop Environment: Desktop KornShell User's Guide**

The *Common Desktop Environment: Desktop KornShell User's Guide* 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.

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

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

#### **4.3.7 Common Desktop Environment: Internationalization Programmer's Guide**

The *Common Desktop Environment: Internationalization Programmer's Guide* 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.

#### **4.3.8 Common Desktop Environment: Product Glossary**

This *Common Desktop Environment: Product Glossary* provides a comprehensive list of terms used in the Common Desktop Environment.

This manual is for all CDE users.

#### **4.3.9 Common Desktop Environment: Programmer's Guide**

The *Common Desktop Environment: Programmer's Guide* 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.

#### **4.3.10 Common Desktop Environment: Programmer's Overview**

The *Common Desktop Environment: Programmer's Overview* 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

#### **4.3.11 Common Desktop Environment: Style Guide and Certification Checklist**

The *Common Desktop Environment: Style Guide and Certification Checklist* 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.



### 4.3.12 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:

- *Common Desktop Environment: ToolTalk Messaging Overview*

The *Common Desktop Environment: ToolTalk Messaging Overview* 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.

This book was previously included in the Windows Programming Documentation Kit.

- *ToolTalk User's Guide*

The *ToolTalk User's Guide* 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*

The *ToolTalk Reference 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.

### 4.3.13 Technical References for Asian Languages

The following guides provide language-specific information and describe the features of several Asian languages supported on the Tru64 UNIX system:

- *Technical Reference for Using Chinese Features* (revised)
- *Technical Reference for Using Japanese Features* (revised)
- *Technical Reference for Using Korean Features* (revised)
- *Technical Reference for Using Thai Features*

#### 4.3.14 X Window System Documentation

The X Window System is a network-transparent window system, in which multiple applications can run simultaneously in windows, generating text and graphics in monochrome or color on a bitmap display. Network transparency means that application programs can run on machines scattered throughout the network. Because the X Window System permits applications to be device-independent, applications need not be rewritten, recompiled, or even relinked to work with new display hardware.

The documentation described in this section was written by the engineers who developed the X Window System and was provided by the X Consortium.

- *X Window System: The Complete Reference to Xlib, X Protocol, ICCCM, XFLD*

The *X Window System: The Complete Reference to Xlib, X Protocol, ICCCM, XFLD* document describes the features of X Window System Version 11, Release 4. This manual was written by Robert W. Scheifler and James Gettys, and was originally published by Digital Press.

- *X Window System Protocol*

The *X Window System Protocol* document describes Version 11, Release 6 of the X Window System protocol. This paper was written by Robert W. Scheifler.

- *Inter-Client Communication Conventions Manual*

The *Inter-Client Communication Conventions Manual* document, proposes suitable conventions for interclient communications with X Window System Version 11 software. The proposed conventions do not attempt to enforce any particular user interface. To permit clients written in different languages to communicate, these conventions are expressed in terms of protocol operations, rather than the more familiar associated Xlib interfaces.

This document (written by David Rosenthal) is based on the Release 6 software.

- *X Toolkit Intrinsics — 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. The *X Toolkit Intrinsics — C Language Interface* document describes the X Toolkit Intrinsics. It is based on Version 11, Release 6.

This manual (written by Joel McCormack, Paul Asente, and Ralph R. Swick) is intended for application programmers who will use one or more of the many widget sets built with the Intrinsics and by widget

programmers who will use the Intrinsics to build widgets for one of the widget sets.

- *X Logical Font Description Conventions*

The *X Logical Font Description Conventions* (XLF) 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. In addition to completely specifying a given font by means of its `FontName`, the XLF also provides for a standard set of key `FontProperties` that describe the font in more detail.

Written by Jim Flowers, this paper is based on X Window System Version 11, Release 6.

- *Xlib — C Language X Interface*

The *Xlib — C Language X Interface* 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. It is not tutorial nor a user's guide to programming the X Window System.

This document, based on Version 11, Release 6 of the X Window System protocol, assumes the user has a basic understanding of a graphics window system and of the C programming language. It was written by Robert W. Scheifler and James Gettys.



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## Additional Documentation

This chapter describes some of the supplementary documentation that is provided on the Operating System CD-ROM, Associated Products CD-ROMs Volumes 1 and 2 and Compaq's Web site. The Printed and Online Documentation sections of the previous chapters describe the supplementary documentation provided on the Documentation CD-ROM.

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.

Examples of supplementary documentation include installation guides and release notes for components such as the Multimedia Services for Tru64 UNIX run-time environment and DECEvent, Software Product Descriptions (SPDs), and lists of fixes made to earlier versions of the operating system.

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

### 5.1 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/](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.

## 5.2 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.

### 5.2.1 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.

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_AdvFS_SPD.pdf
Tru64_UNIX_Developers_Toolkit_SPD.pdf
Tru64_UNIX_Operating_System_SPD.pdf
Tru64_UNIX_Logical_Storage_Manager_SPD.pdf
```

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_AdvFS_SPD.ps
Tru64_UNIX_Developers_Toolkit_SPD.ps
Tru64_UNIX_Operating_System_SPD.ps
Tru64_UNIX_Logical_Storage_Manager_SPD.ps
```

Text versions of the SPDs are located on the CD-ROM in the *mount\_point*/DOCUMENTATION/TEXT directory. The files are named as follows:

```
Tru64_UNIX_AdvFS_SPD.txt
Tru64_UNIX_Developers_Toolkit_SPD.txt
Tru64_UNIX_Operating_System_SPD.txt
Tru64_UNIX_Logical_Storage_Manager_SPD.txt
```

### 5.2.2 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\_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  
Tru64\_UNIX\_V4\_0F\_CLD\_Fixes.txt  
Tru64\_UNIX\_V5\_0\_CLD\_Fixes.txt  
Tru64\_UNIX\_V5\_0A\_CLD\_Fixes.txt  
Tru64\_UNIX\_V5\_1\_CLD\_Fixes.txt

To obtain Tru64 UNIX patch kits from Compaq, visit the following Web site:

**<http://www.support.compaq.com/patches>**

### 5.2.3 Text Version of the Tru64 UNIX Release Notes

As an alternative to the PDF and HTML versions of the Tru64 UNIX *Release Notes* included on the Documentation CD-ROM, an ASCII text version of this document is included on the operating system CD-ROM as follows:

`mount_point/DOCUMENTATION/TEXT/Tru64_UNIX_V5_1_Release_Notes.txt`

### 5.2.4 X Image Extension Documentation

The X Image Extension (XIE) code provides a powerful mechanism for the transfer and display of virtually any image on X-capable hardware. Documentation for XIE is provided in the `/usr/share/doclib/xie` directory on an installed Tru64 UNIX system.

Before you can view or print an XIE document, you must uncompress it using the `gzip -d` command. For more information, 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.

### 5.3 Associated Products CD-ROMs

The Associated Products CD-ROMs contain documentation for various components of Tru64 UNIX. The document called *Tru64 UNIX Version 5.1 CD-ROMs* (a printed sheet packaged with the Tru64 UNIX media kit) provides a list of the applications located on these CD-ROMs, as do the 00README.TXT files located on the CD-ROMs.

Both Associated Products CD-ROMs provide a graphical user interface that you can use to access documentation and to install product software. 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 Associated Products CD-ROMs comply with the ISO 9660 Level 1 CD-ROM standard, which means you can view the contents of these CD-ROMs on a Windows PC or Macintosh or on any other system that uses that ISO standard.



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## 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.

### 6.1 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.

#### 6.1.1 Using the Documentation CD-ROM

The Library on the Documentation CD-ROM includes a category that 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 view any of the HTML books. These references pages are indexed and hot-linked with the books for easy access. (The reference pages for layered products are not included on this CD-ROM.)

#### 6.1.2 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 1.4.1 for information about the Documentation CD-ROM.

### 6.1.3 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.

### 6.1.4 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
```

## 6.2 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.

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#### Note

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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.

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## 6.3 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 five 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 seven 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 divided into two volumes.

***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 sections are for system administrators.

In printed form, these sections are divided into three volumes.

***Reference Pages Sections 9***

Section 9 describes data structures and routines used in writing kernel modules. This section is for developers.

In printed form, this section is in one volume.

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## Device Driver Documentation

Documentation to aid program developers in writing device drivers for Tru64 UNIX is packaged in a separately orderable Device Driver Kit (DDK). This documentation was produced by Compaq writers working closely with the device driver engineers.

This DDK 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.

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### Note

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

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### ***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 shows 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

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## Documentation Listings

This appendix lists the core and supplementary components of the Tru64 UNIX documentation.

### A.1 Components of the Tru64 UNIX Printed Documentation Kits

The documentation in the following list comprise the Tru64 UNIX Documentation Kit (QA-6ADAA-GZ). Except where indicated, this documentation is also provided on the Documentation CD-ROM. See Section 1.5 for information about the printed documentation.

#### **Startup Kit (QA-6ADAC-GZ)**

*Release Notes for Version 5.1*  
*Tru64 UNIX Technical Overview*  
*Documentation Overview*  
*Installation Guide*  
*Installation Guide — Advanced Topics*  
*Full Installation Quick Start Card* (printed only)  
*Update Installation Quick Reference Card* (printed only)  
*Quick Reference Card* (printed only)  
*Tru64 UNIX Version 5.1 CD-ROMs* (printed only)

#### **General User Documentation Kit (QA-6ADAD-GZ)**

*CDE Companion*  
*Command and Shell User's Guide*  
*Master Index*  
*Security*

#### **System and Network Management Documentation Kit (QA-6ADAE-GZ)**

*AdvFS Administration*  
*Guide to Prestoserve*  
*Kernel Debugging*  
*Logical Storage Manager*  
*Network Administration*  
*Sharing Software on a Local Area Network*  
*Software License Management*  
*System Administration*  
*System Configuration and Tuning*  
*System Configuration Supplement: OEM Platforms*  
*X Window System Administrator's Guide* (printed only)  
*X Window System Environment*

### **Developer's Kit (QA-6ADAG-GZ)**

*Assembly Language Programmer's Guide*  
*Asynchronous Transfer Mode*  
*Calling Standard for Alpha Systems*  
*Compaq C Language Reference Manual*  
*Compaq Portable Mathematics Library*  
*Guide to the POSIX Threads Library*  
*Guide to Preparing Product Kits*  
*Guide to Realtime Programming*  
*Network Programmer's Guide*  
*OSF/Motif Programmer's Guide (printed only)*  
*OSF/Motif Style Guide (printed only)*  
*Programmer's Guide*  
*Programmer's Guide: STREAMS (printed only)*  
*Programming Support Tools*  
*Programming with ONC RPC*  
*Writing Kernel Modules*  
*Writing Software for the International Market*

## **A.2 Documentation Only in Media Kit (QA-6ADAA-H8)**

The following documentation is packaged with the Tru64 UNIX media kit, but is not included in any of the Tru64 UNIX operating system documentation kits.

*TruCluster Server Technical Overview*  
*How to Access Tru64 UNIX Documentation (printed only)*

## **A.3 Supplementary Documentation on the Documentation CD-ROM**

The documentation in the following list is provided on the Tru64 UNIX Documentation CD-ROM.

*Advanced Printing Software User Guide*  
*BIND Configuration File Guide*  
*DECEvent Translation and Reporting Utility*  
*How to Order Tru64 UNIX Documentation*  
*Java Documentation*  
*Ladebug Debugger Manual*  
*New and Changed Features from Prior Releases*  
*Object File and Symbol Table Format Specification*  
*Performance Manager*  
*Safety & Comfort Guide*  
*sendmail Installation and Operation Guide*

**Common Desktop Environment documentation**

*Common Desktop Environment: Advanced User's and System Administrator's Guide*  
*Common Desktop Environment: Application Builder User's Guide*  
*Common Desktop Environment: Desktop KornShell User's Guide*  
*Common Desktop Environment: Help System Author's and Programmer's Guide*  
*Common Desktop Environment: Internationalization Programmer's Guide*  
*Common Desktop Environment: Product Glossary*  
*Common Desktop Environment: Programmer's Guide*  
*Common Desktop Environment: Programmer's Overview*  
*Common Desktop Environment: Style Guide and Certification Checklist*  
*Common Desktop Environment: ToolTalk Messaging Overview*  
*Common Desktop Environment: User's Guide*  
*ToolTalk Reference Manual*  
*ToolTalk User's Guide*

#### **Technical references for Asian languages**

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

#### **X Windows documentation**

*Inter-Client Communication Conventions Manual*  
*X Toolkit Intrinsics — C Language Interface*  
*X Logical Font Description Conventions*  
*Xlib — C Language X Interface*  
*X Window System Protocol*  
*X Window System: The Complete Reference to Xlib, X Protocol, ICCCM, XFLD*

## **A.4 Alphabetical Listing of Core and Supplementary Documentation**

Table A–1 provides an alphabetical listing of the documentation that is included in the documentation kits and on the documentation CD–ROM.

**Table A–1: Alphabetical Listing of Core and Supplementary Documentation**

<b>Title</b>	<b>On Line</b>	<b>Printed Line</b>
<i>AdvFS Administration</i>	Yes	Yes
<i>Advanced Printing Software User Guide</i>	Yes	No
<i>Assembly Language Programmer's Guide</i>	Yes	Yes
<i>Asynchronous Transfer Mode</i>	Yes	Yes
<i>BIND Configuration File Guide</i>	Yes	No
<i>Calling Standard for Alpha Systems</i>	Yes	Yes
<i>CDE Companion</i>	Yes	Yes

**Table A-1: Alphabetical Listing of Core and Supplementary Documentation (cont.)**

Title	On Line	Printed Line
<i>Command and Shell User's Guide</i>	Yes	Yes
<i>Common Desktop Environment: Advanced User's and System Administrator's Guide</i>	Yes	No
<i>Common Desktop Environment: Application Builder User's Guide</i>	Yes	No
<i>Common Desktop Environment: Desktop KornShell User's Guide</i>	Yes	No
<i>Common Desktop Environment: Help System Author's and Programmer's Guide</i>	Yes	No
<i>Common Desktop Environment: Internationalization Programmer's Guide</i>	Yes	No
<i>Common Desktop Environment: Product Glossary</i>	Yes	No
<i>Common Desktop Environment: Programmer's Guide</i>	Yes	No
<i>Common Desktop Environment: Programmer's Overview</i>	Yes	No
<i>Common Desktop Environment: Style Guide and Certification Checklist</i>	Yes	No
<i>Common Desktop Environment: ToolTalk Messaging Overview</i>	Yes	No
<i>Common Desktop Environment: User's Guide</i>	Yes	No
<i>Compaq C Language Reference Manual</i>	Yes	Yes
<i>Compaq Portable Mathematics Library</i>	Yes	Yes
<i>DECevent Translation and Reporting Utility</i>	Yes	No
<i>Documentation Overview</i>	Yes	Yes
<i>Full Installation Quick Start Card</i>	No	Yes
<i>Guide to Prestoserve</i>	Yes	Yes
<i>Guide to Preparing Product Kits</i>	Yes	Yes
<i>Guide to the POSIX Threads Library</i>	Yes	Yes
<i>Guide to Realtime Programming</i>	Yes	Yes
<i>How to Access Tru64 UNIX Documentation</i>	No	Yes
<i>How to Order Tru64 UNIX Documentation</i>	Yes	Yes
<i>Installation Guide</i>	Yes	Yes
<i>Installation Guide — Advanced Topics</i>	Yes	Yes
<i>Inter-Client Communication Conventions Manual</i>	Yes	No

**Table A-1: Alphabetical Listing of Core and Supplementary Documentation (cont.)**

<b>Title</b>	<b>On Line</b>	<b>Printed Line</b>
Java Documentation	Yes	No
<i>Kernel Debugging</i>	Yes	Yes
<i>Ladefug Debugger Manual</i>	Yes	No
<i>Logical Storage Manager</i>	Yes	Yes
<i>Master Index</i>	Yes	Yes
<i>Network Administration</i>	Yes	Yes
<i>Network Programmer's Guide</i>	Yes	Yes
<i>New and Changed Features from Prior Releases</i>	Yes	No
<i>Object File and Symbol Table Format Specification</i>	Yes	No
<i>OSF/Motif Programmer's Guide</i>	No	Yes
<i>OSF/Motif Style Guide</i>	No	Yes
<i>Performance Manager</i>	Yes	No
<i>Programmer's Guide</i>	Yes	Yes
<i>Programmer's Guide: STREAMS</i>	No	Yes
<i>Programming Support Tools</i>	Yes	Yes
<i>Programming with ONC RPC</i>	Yes	Yes
<i>Quick Reference Card</i>	No	Yes
<i>Release Notes for Version 5.1</i>	Yes	Yes
<i>Safety &amp; Comfort Guide</i>	Yes	No
<i>Security</i>	Yes	Yes
<i>sendmail Installation and Operation Guide</i>	Yes	No
<i>Sharing Software on a Local Area Network</i>	Yes	Yes
<i>Software License Management</i>	Yes	Yes
<i>System Administration</i>	Yes	Yes
<i>System Configuration and Tuning</i>	Yes	Yes
<i>System Configuration Supplement: OEM Platforms</i>	Yes	Yes
<i>Technical Reference for Using Chinese Features</i>	Yes	No
<i>Technical Reference for Using Japanese Features</i>	Yes	No
<i>Technical Reference for Using Korean Features</i>	Yes	No

**Table A-1: Alphabetical Listing of Core and Supplementary Documentation (cont.)**

Title	On Line	Printed Line
<i>Technical Reference for Using Thai Features</i>	Yes	No
<i>ToolTalk User's Guide</i>	Yes	No
<i>ToolTalk Reference Manual</i>	Yes	No
<i>Tru64 UNIX Version 5.1 CD-ROMs</i>	No	Yes
<i>Tru64 UNIX Technical Overview</i>	Yes	Yes
<i>TruCluster Server Technical Overview</i>	Yes	Yes
<i>Update Installation Quick Reference Card</i>	No	Yes
<i>Writing Kernel Modules</i>	Yes	Yes
<i>Writing Software for the International Market</i>	Yes	Yes
<i>Xlib — C Language X Interface</i>	Yes	No
<i>X Logical Font Description Conventions</i>	Yes	No
<i>X Toolkit Intrinsic — C Language Interface</i>	Yes	No
<i>X Window System Administrator's Guide</i>	No	Yes
<i>X Window System Environment</i>	Yes	Yes
<i>X Window System Protocol</i>	Yes	No
<i>X Window System: The Complete Reference to Xlib, X Protocol, ICCCM, XFLD</i>	Yes	No

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## Reader's Comments

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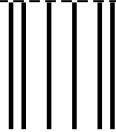
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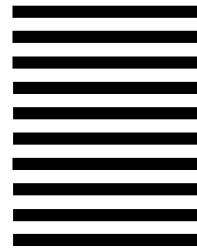
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