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Guide to

UNIX[®] Using Linux



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Jack Dent • Tony Gaddis

Guide to UNIX[®] Using Linux



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Introduction



Guide to UNIX Using Linux introduces the fundamentals of the UNIX operating system to the PC user. UNIX is “the operating system of the Internet,” powerful and flexible enough for both servers and desktop computers. Taking a hands-on, practical approach, this book guides you through the basics of UNIX system concepts, architecture, and administration. You practice these basic concepts and approaches using Linux, a PC-compatible clone of UNIX that is an ideal teaching tool for mastering UNIX commands. The book achieves its goals with a proven combination of tools that powerfully reinforce both concepts and real-world experience.

This book includes:

- RedHat Linux 6.0 and complete installation instructions
- Comprehensive review and end-of-chapter material, including a command summary, review questions, hands-on exercises, and case projects, which let you practice and master skills as you learn them
- Step-by-step instructions to teach UNIX commands, shell programming, database management, text editing, C programming, debugging, and rapid application development using standard UNIX tools such as awk, sed, and perl
- A proven method to provide a working knowledge of basic system administration requirements and how to achieve them

In addition, the text is carefully structured, clearly written, and accompanied by graphics that provide the visual reinforcement essential to learning. And for instructors using the book in a classroom, a special CD-ROM is available that includes an instructor’s manual and an online testing system. Contact customer service or your sales representative to obtain a copy of the CD-ROM.

Coverage is balanced, with one chapter building on the skills and knowledge acquired in the preceding chapters. Operating systems, and UNIX and Linux in particular, are introduced in **Chapter 1**, along with essential information such as using UNIX shells, entering commands, and understanding the role of the system administrator. **Chapter 2** explores the UNIX file system—its partitions and directories—and how to navigate it. **Chapter 3** focuses on the UNIX editors, providing instruction on using the vi and Emacs editors. **Chapter 4** explains the UNIX approach to file processing, while **Chapter 5** covers advanced file processing concepts. **Chapters 6 and 7** introduce you to shell programming, and **Chapter 8** provides practice with UNIX utilities. **Chapters 9 and 10** teach programming tools such as awk, sed, perl, and C/C++. **Chapter 11** covers a recent development in UNIX: the X Window system, which provides a graphical user interface for UNIX.

Features

In order to ensure a successful learning experience, this book includes the following pedagogical features:

- **Learning Objectives:** Every chapter opens with a list of learning objectives that sets the stage for you to absorb the lessons of the text.
- **Case Approach:** Each chapter opens with a hypothetical case. You solve the problem posed by the case by working through the material in the chapter.
- **Comprehensive Step-by-Step Methodology:** The unique Course Technology methodology keeps students on track. The text introduces new concepts, illustrates them through examples, and guides you through practice steps to achieve mastery of the material.
- **Tips:** Tips, which are marked with the Tip icon, are used to highlight additional helpful information related to the subject being discussed.
- **Summaries:** Following each chapter is a summary that recaps the concepts covered in the chapter, and a table listing the related commands and their options.
- **Review Questions:** Each chapter concludes with meaningful, conceptual review questions that test students' understanding of what they learned in the chapter.
- **Exercises:** The review questions are followed by exercises, which provide students with additional practice using the skills and concepts they learned in the chapter.
- **Discovery Exercises:** Each chapter concludes with Discovery Exercises, which reinforce the chapter concepts and allow for independent study.
- **RedHat Linux 6.0:** Each book is bundled with a copy of RedHat Linux 6.0. Linux is a PC-compatible clone of UNIX that is an ideal teaching tool for many basic and advanced UNIX commands. Course Technology does not offer Technical Support for this software. However, if there is a problem with the media, please contact customer service or your sales representative.

Supplements

For instructors using this book in a classroom environment, the following teaching materials are available on a single CD-ROM:

Electronic Instructor's Manual: The Instructor's Manual that accompanies this textbook includes a list of objectives for each chapter, a detailed chapter lecture notes, suggestions for classroom activities, discussion topics; and solutions.

Course Test Manager 1.2: Accompanying this book is a powerful assessment tool known as the Course Test Manager. Designed by Course Technology, this cutting-edge Windows-based testing software helps instructors design and administer tests and pretests. In addition to being able to generate tests that can be printed and administered, this full-featured program also has an online testing component that allows students to take tests at the computer and have their exams automatically graded. The test bank that accompanies this book contains 50–100 questions per chapter.

PowerPoint Presentations: This book comes with Microsoft PowerPoint slides for each chapter. This lecture tool covers all of the key points and art for each chapter. The Presentations are included as a teaching aid for classroom presentation, to make available to students on the network for chapter review, or to be printed for classroom distribution.

System Requirements

To install Red Hat Linux 6, your computer must meet the following minimum requirements:

- Intel 486 processor
- 16 MB of RAM
- 500 MB free hard disk space
- 3.5-inch floppy drive
- CD-ROM drive

To access a UNIX/Linux host on a local-area network to which your computer is connected, you need the following software and information:

- Telnet program
- Either the IP address or the host and domain name of the UNIX system

To access a UNIX/Linux host via the Internet, you need the following software and information:

- Dial-up connection to an Internet Service Provider
- Telnet program
- Either the IP address or the host and domain name of the UNIX system

Acknowledgments

I would like to thank my wife, Jean, and Lisa Egan at Course Technology for their patience and friendly persuasion when I deserved neither. I would also like to dedicate this book to all my “wide-eyed” students at International Business College, in particular, Adam, a.k.a. Mercedes. Long live free, open, operating systems!

– Jack Dent

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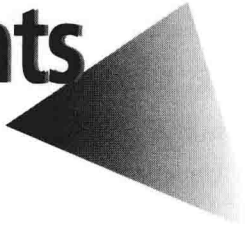
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CHAPTER

1

The Essence of UNIX

case ► Dominion Consulting specializes in management systems for large hotels and resorts. Dominion's founders, Eli Addison and Carmen Scott, recognize the need for an in-house computer system that lets their employees work as a team. UNIX is an operating system designed for collaborative development of software, allowing people to work together and share information in controlled ways. Dominion has offered you a position as a UNIX system trainee. Your managers want you to understand the basics of operating systems in general, and UNIX in particular. They ask you to log on to UNIX and learn how to use some basic commands.

LESSON A

objectives

After completing this lesson, you should be able to:

- Define operating systems in general and the UNIX operating system in particular
- Describe Linux as it relates to UNIX
- Explain the function of UNIX shells
- Describe options for connecting to a UNIX system
- Define the syntax used for entering UNIX commands
- Use the date, cal, who, man, whatis, and clear commands
- Perform basic command-line editing operations
- Enter multiple commands on a single command line
- Recall a command from the command history
- Log on to and log out of UNIX

Getting Started with UNIX

This chapter introduces the UNIX operating system and a few of its basic commands. It also explains how you can use Linux to learn UNIX. A variant of UNIX, Linux runs on PCs with Intel processors but uses the same file system and commands as UNIX, which usually runs on a network. Using Linux on your PC is virtually the same as using UNIX on a network.

After you explore essential background information in this chapter, you begin to work with UNIX. If you're familiar with operating systems in general, then some background material may be review for you. This chapter also provides plenty of opportunity for hands-on practice of UNIX commands, primarily in the context of the opening case. The case study reflects a realistic scenario for the tasks you complete in this chapter. You learn to use a variety of basic commands to meet the goals of the scenario.

Understanding Operating Systems

An **operating system** (OS) is the most important program that runs on a computer. Operating systems enable you to store information, process raw data, use application software, compile your own programs, and access all hardware attached to a computer, such as a printer or keyboard. In short, the operating system is the most fundamental