

Preface

Welcome to the *Linux[®] Certification Bible!* This book is designed to help you acquire the knowledge, skills, and abilities you need to pass CompTIA's Linux+ Certification:

* **Exam XK0-001** : Linux+ Certification

This book is designed to be the only book or course you need to prepare for and pass CompTIA's Linux+ Certification exam, which is one of the newest members of CompTIA's certification family.

This book deals with all of the objectives stated by CompTIA for the Linux+ exam. You learn how to deal with planning a Linux implementation (including installing Linux in a GUI or text-based environment) and configuring the Linux operating system after installation. This book also teaches you how to administrate and maintain your Linux system, troubleshoot common problems, and how to identify, install, and maintain system hardware.

My hope is that you'll find this book the most helpful Linux+ Certification product reference that you've ever read. I also hope that you'll use it not only to prepare for CompTIA's Linux+ Certification exam, but that you'll come back to it again and again as you perform your day-to-day Linux professional tasks.

How This Book Is Organized

This book is organized into seven major parts, followed by a glossary, an index, and one CD. Here's what you'll find in this book:

Part I: Linux Basics

Part I presents the information that you need to understand Linux. This part covers the creator of Linux and a brief history about the development of Linux . The Linux Kernel and the many different types Linux distributions are also discussed.

Part II: Installation

Part II includes the instructions on how to perform a proper installation of Linux. GUI and text-based installations are covered. Identifying all system requirements and validating that they support Linux is also included. The different types of roles

and services of Linux system are discussed along with identifying where to obtain software and resources.

Part III: Configuration

Part III is about configuring your Linux system. This part teaches you how to configure X windows with automated utilities and workstations for remote access. This part also covers how to add and configure printers along with information about installing and configuring add-in hardware, reconfiguring the boot loader, and editing basic configuration files.

Part IV: Administration

Part IV covers how to administrate a Linux-based environment. This part shows you how to create and delete users, modify existing users, and create, modify, and delete groups. Next, this part teaches you how to identify and change file permissions, manage and navigate the Linux hierarchy, and mount and manage file systems, devices, common shell commands, and expressions. You also learn how to use network commands to create, extract, and edit file and tape archives by using `tar`. The part ends with the information that you need to manage runlevels; starting, stopping, and restarting services; managing print spool and queues; using `vi`; and managing and navigating the GUI. It also teaches you how to program basic shell script by using common shell commands.

Part V: Maintaining the Linux System

Part V is about maintaining the Linux system. This part provides you with information on how to monitor and maintain processes, network interfaces, system logs, security, and backup. Areas in this part include creating and managing local storage devices and file systems, understanding functions of the `cron` command, identifying core dumps, and how to run and interpret `ifconfig`. This part focuses on downloading and installing patches and updates; identifying, executing, and killing processes; monitoring system log files; and how to properly document work performed on a system. This part also teaches you how to perform and verify backups and restores, gives you security best practices, and teaches you how to set daemon and process permissions.

Part VI: Troubleshooting and Maintaining System Hardware

Part VI is about troubleshooting Linux systems. This part provides you with the basic knowledge and skills to identify, inspect, and diagnose problems in the Linux operating system and how to apply remedies by using common commands and utilities. In this part, you learn how to identify and locate the problem by determining whether the problem originates from: hardware, operating system, application

software, configuration, or the user. You also learn troubleshooting best practices, editing configuration files based on symptoms using system utilities, using systems boot disk(s) and root disks on workstations and servers to diagnose and rescue file systems. This part also teaches you how to inspect and determine causes of errors from system log files, how to use disk utilities to solve file system problems, and how to recognize common errors. You learn how to take appropriate action on boot errors, how to identify backup and restore errors, how to identify and use troubleshooting commands, and how to locate troubleshooting resources and updates.

This part also covers the knowledge that you need to maintain your Linux system hardware. This part covers the knowledge and skills you need to install, configure and troubleshoot core and peripheral hardware in a Linux environment. This part includes information on generic hardware issues and Linux specific hardware issues. Topics in this part include: Identifying basic terms, concepts, and functions of system components, including how each component should work during normal operation and during the boot process; removing and replacing hardware and accessories, identifying basic networking concepts; and proper procedures for diagnosing and troubleshooting ATA, SCSI, and peripheral devices. You also find the knowledge on how to properly troubleshoot core system hardware, including processors, RAM, and mainboards.

CD-ROM

The compact disc included with this book contains some excellent resources and programs. You'll find this entire book in Adobe PDF format and a variety of different programs that I hope you will find useful. To find out more about the CD-ROM, please see Appendix A.

How Each Chapter Is Structured

A lot of thought went into the structure and design of this book, particularly the specific elements that will provide you with the best possible learning and exam preparation experience.

Here are the elements you'll find in each chapter:

- ◆ The complete exam objectives that are covered in the chapter
- ◆ A Chapter Pre-Test to test your knowledge before reading the chapter
- ◆ Clear, concise text on each topic
- ◆ Screen shots and graphics that are worth more than a thousand words
- ◆ A Summary

- ◆ A comprehensive Study Guide that contains:
 - Exam-style Assessment Questions
 - Scenario problems for you to solve,
 - A Lab that you can use to sharpen your skills
 - Answers to Chapter Pre-Test Questions, Assessment Questions, and Scenarios

How to Use This Book

This book can be used either by individuals working independently or by groups in a formal classroom setting.

For best results, I recommend the following plan of attack as you use this book. First, take the Chapter Pre-Test, and then read the chapter and the Key Point Summary. Use this summary to see if you really understand the key concepts. If you don't, go back and reread the section(s) that you're not clear on. Then, do all of the Assessment Questions and Scenarios at the end of the chapter. Remember, the important thing is to master the tasks that are tested by the exams.

The chapters of this book are designed to be studied sequentially. In other words, it's best if you complete Chapter 1 before you proceed to Chapter 2. A few chapters can probably stand alone, but all in all, I recommend a sequential approach.

After you've completed your study of the chapters and reviewed the Assessment Questions in the book, use the test engine on the compact disc included with this book to get some experience answering practice questions. The practice questions will help you assess how much you've learned from your study and will also familiarize you with the type of exam questions you'll face when you take the real exam. After you identify a weak area, you can restudy the corresponding chapters to improve your knowledge and skills in that area.

Although this book is a comprehensive study and exam preparation guide, it does not start at ground zero. I assume that you have the following knowledge and skills at the outset:

- ◆ Basic terminology and basic skills to use a Linux distribution
- ◆ Basic mouse skills: being able to left-click, right-click, double-click, use the pointer, and so on.
- ◆ Basic PC hardware and networking comprehensions

If you meet these prerequisites, you're ready to begin this book.

If you don't have the basic Linux experience or mouse skills, I recommend that you work through a self-study book, such as *Linux For Dummies* (Hungry Minds, Inc.) or the *Linux Bible* (Hungry Minds, Inc.).

Conventions Used in This Book

Every book has its own set of conventions, so I'll explain the icons I've used in this book.

You'll see icons throughout each chapter. Six types of icons are used in this book. Below are the explanations of each icon:



This icon is used to warn you that something unfortunate could happen if you're not careful. It also points out information that could save you a lot of grief. It's often easier to prevent a tragedy than to fix it afterwards.



This icon points you to another place in this book for more coverage of a particular topic. It may point you back to a previous chapter where important material has already been covered, or it may point you ahead to let you know that a topic will be covered in more detail later on.



This icon points out important information or advice for those preparing to take the Linux+ Certification exam.



Sometimes things work differently in the real world than books—or product documentation—say they do. This icon draws your attention to the author's real-world experiences, which will hopefully help you on the job (if not on the Linux+ certification exam).



This icon is used to draw your attention to a little piece of friendly advice, a helpful fact, a shortcut, or a bit of personal experience that might be of use to you.



This icon points out exactly where an exam objective is covered in a particular chapter, so you can focus your efforts on the areas where you need the most practice.