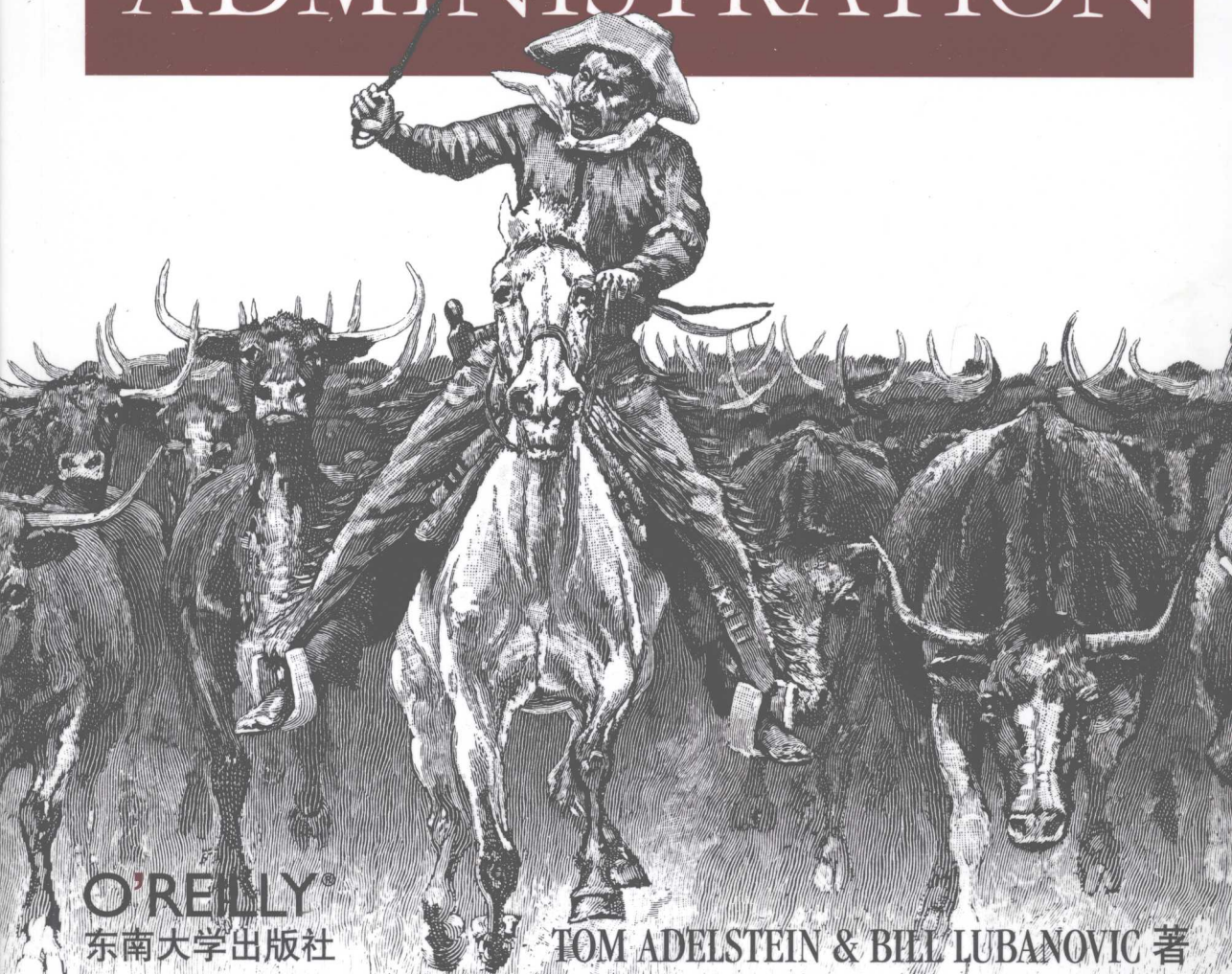


LINUX系统管理 (影印版)

LINUX

SYSTEM ADMINISTRATION



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TOM ADELSTEIN & BILL LUBANOVIC 著

LINUX

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LINUX系统管理(影印版)

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藏书章

Tom Adelstein and Bill Lubanovic

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南京 • 东南大学出版社

图书在版编目 (CIP) 数据

Linux 系统管理: 英文 / (美) 阿德斯特 (Adelstein, T.),
(美) 卢布诺维克 (Lubanovic, B.) 著. — 影印本. — 南
京: 东南大学出版社, 2008.2

书名原文: Linux System Administration

ISBN 978-7-5641-1038-3

I . L … II . ①阿… ②卢… III . Linux 操作系统—英
文 IV . TP316.89

中国版本图书馆 CIP 数据核字 (2007) 第 193116 号

江苏省版权局著作权合同登记

图字: 10-2007-218 号

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英文原版由 O'Reilly Media, Inc. 出版 2007。

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Linux 系统管理 (影印版)

出版发行: 东南大学出版社

地 址: 南京四牌楼 2 号 邮编: 210096

出 版 人: 江 汉

网 址: <http://press.seu.edu.cn>

电子邮件: press@seu.edu.cn

经 销: 全国各地新华书店

印 刷: 扬中市印刷有限公司

开 本: 787 毫米 × 980 毫米 16 开本

印 张: 18.75 印张

字 数: 315 千字

版 次: 2008 年 2 月第 1 版

印 次: 2008 年 2 月第 1 次印刷

书 号: ISBN 978-7-5641-1038-3/TP · 174

印 数: 1 ~ 3500 册

定 价: 42.00 元 (册)

本社图书若有印装质量问题, 请直接与读者服务部联系。电话 (传真): 025-83792328

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Preface

As Bill Lubanovic and I were putting the final touches on this book, I overheard a conversation between two coworkers in our Cisco lab discussing Linux. The senior networking guru of the two made an interesting remark. He said that despite all his knowledge, he felt incomplete as a professional because he had never learned Linux. A moment later he and the other gentleman turned to me and looked me square in the eyes. I smiled and went on working.

That evening, our director of Information Technology made an offhand remark to me during a conference that struck me as unusual. He said that he wanted to learn Apache, and when I asked him why he replied, "I just want to learn it," and left it at that.

Later in the conference, our director requested feedback from the group on a solution for patch management, explaining and using the example of *rsync*. He said he wanted something similar, while launching into a detailed technical discussion of incremental and cumulative patch management. I have a good working knowledge of *rsync*, but hadn't heard such a detailed academic explanation of any open source tool in any forum.

In both of those cases and many others, I wished I had this book ready to hand over to highly trained and skilled people who wanted to learn Linux administration. Perhaps you have had similar experiences and wished you had a book like this one at hand. I venture to guess that conversations like the ones I've just described occur many times in many places daily.

When Andy Oram and I began discussing a Linux system administration book, we had a slightly different idea of what we wanted to accomplish. Andy talked about a book in which each chapter took users through the steps of building and deploying application servers without co-mingling detailed discussions. He suggested that the discussion reside in one place in each chapter and the technical steps in another.

Later, I proposed that we make each chapter a module unto itself and let the reader complete the modules he wanted and/or needed. As this book evolved, we felt that we'd accomplished that objective. You do not have to read this book cover to cover to become a Linux system administrator. Simply start where you have the most interest.

When I first started using Linux, the community consisted mostly of programmers and hobbyists. I don't recall any discussion lists that focused on desktops or commercial applications. We logged onto the Internet by starting a daemon. We didn't have dialers or web browsers like the ones available today. The vast majority of people I knew did their own system administration or were in some stage of learning.

Reflecting on the time when we estimated that 30,000 Linux users existed on the planet, I'm amazed at how many people use Linux today and haven't the slightest idea how to write a configuration file. Linux forums seem to be filled with people asking how to get CUPS or Samba to work. On mailing lists, people hold detailed discussions on the technical details of projects like Postfix, JBoss, and Monit.

Many people still itch to learn the extensive capabilities of Linux as an application platform. If you use Linux and want to take the next step from a power user to an administrator, this book will help you make the transition. We wrote this book with you in mind.

How This Book Is Organized

Chapter 1, *Requirements for a Linux System Administrator*

Lays out the goals of the book and what you'll gain by reading it.

Chapter 2, *Setting Up a Linux Multifunction Server*

Gets you started with a nearly Internet-ready server.

Chapter 3, *The Domain Name System*

Shows you the basics of setting up primary and secondary DNS servers.

Chapter 4, *An Initial Internet-Ready Environment*

Uses the ISPConfig free software configuration system to get you started with a rich set of services that you can practice while reading the rest of the book.

Chapter 5, *Mail*

Sets up a Postfix mail server with SASL authentication, a POP server, and an IMAP server.

Chapter 6, *Administering Apache*

Gives a quick run-through of the popular Apache, MySQL, and PHP combination (together with Linux, known as a LAMP server), including SSL authentication.

Chapter 7, *Load-Balanced Clusters*

Extends the previous chapter's Apache configuration with IP Virtual Server and *ldirectord* to provide high availability.

Chapter 8, *Local Network Services*

Shows you how to manage users and configure common networking elements such as DHCP and gateway software on local area networks (LANs).

Chapter 9, *Virtualization in the Modern Enterprise*

Shows how to set up Xen, VMware on a Linux host and then add guest operating systems.

Chapter 10, *Scripting*

Shows you some basic techniques for writing robust and powerful *bash* shell scripts that can save you a lot of administration time.

Chapter 11, *Backing Up Data*

Presents a range of techniques for carrying out this crucial function, from basic *rsync* and *tar* to the powerful Amanda system.

Appendix, *bash Script Samples*

Contains a few shell scripts that we've found useful when doing system administration and that might give you tips for how to write your own scripts.

Conventions Used in This Book

The following typographical conventions are used in this book:

Italic

Indicates new terms, URLs, commands and command-line options, email addresses, filenames, file extensions, and directories.

Constant width

Indicates the contents of files or the output from commands.

Constant width bold

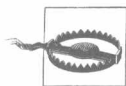
Shows commands or other text that should be typed literally by the user. Also used to highlight key portions of code or files.

Constant width italic

Shows text that should be replaced with user-supplied values.



This icon signifies a tip, suggestion, or general note.



This icon indicates a warning or caution.

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Acknowledgments

Books such as *Linux System Administration* come into existence only with the contribution of many people's efforts. Consider it impossible to list them all here.

First, we would like to thank Andy Oram, whose editing, writing, and management efforts to get this book into shape seem remarkable. Apart from working as the overall editor, Andy contributed materially to the content of this book. Andy functioned like a project manager and demonstrated both patience and discipline.

We could not have asked more from the contributions of Falko Timme, Phil Howard, and Herschel Cohen. Falko lent his time and expertise to Chapters 2 and 4. Phil wrote the bulk of Chapter 11 and provided the framework for Chapter 10 and the accompanying appendix of scripts. Herschel wrote sections of several chapters, including Chapters 8 and 10, and contributed his expertise to Chapter 6. All three contributors also reviewed other parts of the book.

Many thanks are also due to our technical experts, who spent countless hours reviewing, testing, and making suggestions about our work: Markus Amersdorfer, Keith Burgess, Robert Day, Ammar Ibrahim, and Yaman Saqqa.

Special thanks go to Yvonne Adelstein and Mary Lubanovic, our wives, who showed remarkable patience. We could not have done this without your total support.

About the Authors

Tom Adelstein began his career in investment banking, where his technical skills helped financial service companies become industry leaders. He is now a full-time system administrator and a technical writer.

Bill Lubanovic started developing software with Unix in the 1970s, GUIs in the 1980s, and the Web in the 1990s. He now does web visualization work for a wind energy company.

Colophon

The image on the cover of *Linux System Administration* is a cowboy running cattle.

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Requirements for a Linux System Administrator

We like Linux. Of all the Unix and Unix-like systems we've used, many now forgotten,* Linux is our favorite. It's an excellent server platform, a good desktop, and the center of much innovation in the current computing world.

Linux probably has the broadest reach of any operating system, from tiny systems the size of phone jacks, to cell phones, to supercomputer clusters bigger than your high school. It has infiltrated the fields of telecommunications, embedded systems, satellites, medical equipment, military systems, computer graphics, and—last but not least—desktop computing.

In a relatively short time, Linux progressed from a Finnish hacker's hobby to a top-tier enterprise-level system backed by high rollers such as IBM and Oracle. The user base has grown from about 30,000 people in 1995 to hundreds of millions today. During the Internet boom of the 1990s, many Unix administrators were surprised to find that Linux on PC hardware could outperform more expensive Unix workstations and servers. Many Windows and Novell administrators saw that Linux could handle DNS, email, and file services more reliably and with less support personnel than their current platforms. The growth of the Internet, and especially the Web, fueled a rapid expansion in the use of Linux servers and the need for people to manage them.

This book is for Linux system administrators. However, you may be a grizzled Unix veteran, a brave MCSE, or a stoic mainframer. You're exploring new territory and need a map and compass. Some of the ground will be familiar, but some will be terra incognita. This book covers many topics that have only recently joined the mainstream, for instance load-balanced clusters and virtualization.

The success of the Internet and open source software is changing business. Google, Amazon, eBay, and others have built huge server farms with commodity hardware and relatively few administrators compared to traditional mainframe and PC installations.

* Our favorite name was PNX, pronounced almost like something that would never appear in an O'Reilly book.

The skills needed to develop and maintain such distributed systems and applications are not taught in schools but learned from experience, sometimes bitter and sometimes sweet.



While writing this book we've constantly tested the latest distributions and tools, and we'll keep up our experimentation after the book is released. We invite readers to come to the test site we set up for the book, <http://www.centralsoft.org>, where we'll publish updates to examples, pointers to useful new tools we've discovered, and other tips.

About This Book

System administration books used to be fairly predictable. They showed you how to manage users, filesystems, devices, processes, printers, networks, and so on. They did not tell you what to do when new problems emerged. If your web site became popular, you had to learn quickly about proxy servers, different levels of caching, load balancing, distributed authentication, and other complex issues. If you added a database, you soon needed to scale it and learn to avoid SQL injection attacks. Overnight, sites became mission critical, and you needed the ability to make hot backups on 24×7 systems.

If you've been through these fire drills, you may have become tired of doing everything the hard way, facing new technical challenges nearly every day with few sources of help. Technical documentation—whether for commercial or open source software—rarely keeps up with the technology, and the gap seems to be widening. For example, open source directory servers have become important for managing computers, users, and resources. The original RFC-compliant protocols underlie many commercial products, but good documentation for community projects is surprisingly scarce.

How Can We Help?

Linux people are problem solvers. A typical Linux power user can put together a small server, get a dedicated Internet pipe with static IP addresses into her home, register a domain name, and build a server on the Internet. If you fall into this category, you can simply plow through the other topics in this book and expand your job possibilities.

To some of you, however, all that may sound like the equivalent of rappelling down a 10,000-foot mountain. If you're one of them, just start somewhere. As the saying goes, you eat an elephant one bite at a time, and damn the torpedoes.

You may have certifications for operating systems other than Linux. While you're applying patches and hot fixes, your boss may ask you to deploy an Apache server, or handle your own DNS lookups, or replace Exchange with Zimbra.

Whether you just want to learn or actually *have* to learn, you'll likely need some help climbing the Linux power user curve. That's exactly what we're here for: to help you explore the Linux system landscape without all the hardships our forefathers experienced.

Where Do You Start?

This book summarizes the steps you need to follow to build standalone servers. If you need to build a mail server, create a web server and blogging system, or set up a gateway for your LAN, you can jump right into the middle of the book. You don't have to read *Linux System Administration* from cover to cover.

We start you working right away, presenting a step-by-step guide to building a Linux server in Chapter 2. You can choose whatever path works for you, whether it involves creating a highly available cluster for web services, server consolidation through virtualization using Xen or VMware, or setting up a server for local area networks.

Running a modern operating system is incredibly cheap. You can set up a sophisticated learning center for yourself on hardware that many sites would consider obsolete and give away for free. We started with a used box powered by an Intel CPU two generations older than current models, added older versions of hard drives and memory, and went with a no-frills, free version of Linux.

Do You Need a Book?

Technical books have waned in popularity as the Internet has matured. To write a successful book today, the author has to provide significant value to the reader. An interesting story about one of the first e-commerce sites on the Web helps explain the value a book should deliver. A cheesecake company put up an advertisement in the earliest days of the Web. According to the story, several months passed and the company didn't receive a single order. In an unusual move, the president of the company published the company's secret cheesecake recipe. Within hours, he began receiving calls on his toll-free line. People began ordering cheesecakes in large numbers. Consumers looked at the recipe, considered the effort required to make their own cheesecakes, and saw the value in buying them from the company.

Many of the ingredients for this book were scattered across the Internet, in mailing lists, forums, and discussion groups, while others were mined from books, periodicals, and the experiences of colleagues. We solved a number of problems whose solutions were completely undocumented in the course of researching this book, and we pass our lessons on to you.

Many excellent project sites have inadequate documentation. Developers work hard to provide excellent software for free, but prose often trails code for many reasons: lack of time, lack of resources, lack of interest, language barriers, and so on.