

Introduction

So you've decided to buy my book (or you are at least intrigued enough to read the introduction). This book is a comprehensive guide to Red Hat Enterprise Linux 5, specifically geared at system administrators.

Read on to find out what Red Hat Enterprise Linux is, why this book is different than all the other Linux books out there, who the target audience is, and what type of information can be found in it.

I hope reading this book helps you understand Linux administration more. If it allows you to be better informed of the Linux technology before making an important decision, helps you develop a solution to an administrative problem, or serves as a reference for your day-to-day tasks, I have accomplished my goal in writing this book—providing concise, easy-to-read technical content that educates administrators and empowers them to do their job with ease and confidence. Use this book to explore all the possible administrative solutions available in Red Hat Enterprise Linux 5 and determine which ones are best for you and your organization, whether your organization consists of just you or thousands of users.

What Is Red Hat Enterprise Linux?

Starting in 2001, Red Hat, Inc. began offering Red Hat Enterprise Linux in addition to their original consumer operating system, Red Hat Linux. In 2003, Red Hat started the Fedora Project to release the Fedora Core operating system instead of Red Hat Linux.

The Fedora Project progresses at a rapid rate, releasing a new version of Fedora every four to six months. This allows new technologies to be tested by millions of users, which in turn decreases the amount of time it takes for these technologies to stabilize into production-ready software. Each release of Red Hat Enterprise Linux is based on a Fedora operating system release. The kernel and all of the other software in Red Hat Enterprise Linux are specifically configured and tested for enterprise-level usage.

Both Red Hat Enterprise Linux and Fedora are based on open source software developed by the open source community, some of whom are members of the Red Hat engineering team. The term *open source* means that the programming code is freely available to anyone and that anyone can submit code to an existing open source project as long as the code stays open source. New projects or programs can be created based on a different open source project or program. Open source developers live all over the world, and they collaborate on projects every day together.

Key Features of This Book

Unlike most Linux books, this book gives and discusses examples for administering one or thousands of systems at the same time. It provides guidelines for writing procedures and policies such as backup procedures and user management policies so that they are scalable

for future growth. It also provides details about the new features of Red Hat Enterprise Linux 5 including Virtualization for setting up virtual machines in which multiple operating systems are run on the same physical hardware, Security-Enhanced Linux and ExecShield for protecting against common forms of intrusion, and Kdump for capturing kernel dump information for further analysis.

64-bit processors are quickly becoming the new standard in computing power. This book recognizes this shift and provides specific instructions for 32-bit and 64-bit processors, including a chapter dedicated to how Red Hat Enterprise Linux supports 64-bit, multi-core, and Hyper-Threading Technology processors.

This book is written in a concise writing style to allow the reader to find the information he is looking for as quickly as possible. This is especially important when an administrator needs to recover from a system failure. Step-by-step procedures are given whenever possible so the reader can read it once and then quickly bookmark the reference content so they can go back to it time and time again.

For potential Red Hat Enterprise Linux customers, this book demonstrates why Red Hat Enterprise Linux is an enterprise operating system. For existing Red Hat Enterprise Linux subscribers, it offers insight into the new technologies available since version 4. For the seasoned administrator, it helps develop a deeper insight into system optimization and task automation.

After reading this book, the reader will have a deeper knowledge of what tools and resources are available for Red Hat Enterprise Linux 5. For example, many of the system performance monitoring and tuning tools are not well documented or not documented at all because of their recent arrival to Red Hat's enterprise operating system. They will serve as invaluable tools for a Linux administrator.

Who Should Read This Book

This book is dedicated to helping administrators who manage networks of all sizes. The core audience is Linux system administrators for small-to-medium businesses all the way up to large corporations. The concepts explained in this book can be scaled for a few hundred or a few thousand systems. Other intended readers include decision makers interested in an overview of Red Hat's enterprise offerings and anyone curious about what Linux can do.

Use this book as a concise reference for all the administration tools available in Red Hat Enterprise Linux. Knowing what tools and resources are available is half the battle of becoming an efficient, flexible system administrator. This book saves administrators time by giving them the foundation they need to learn more details about a particular concept or application as well as assists them in delivering their IT solutions.

How This Book Is Organized

This book is divided into six parts:

Part I: Installation and Configuration

Part II: Operating System Core Concepts

Part III: System Administration

Part IV: Network Services

Part V: Monitoring and Tuning

Part VI: Security

Part I, “Installation and Configuration,” discusses how to install Red Hat Enterprise Linux 5 on a single system or multiple systems at the same time using a set of preselected installation options in a kickstart script. After installation, this part guides you through post-installation configuration from logging in to the system to adding boot parameters. The part ends with a chapter on updating your systems with the latest, most secure software sets.

Before detailing system administration practices, important operating system concepts must be understood or reviewed. The concepts in the Part II, “Operating System Core Concepts,” will prove beneficial to you as you read and study the remainder of this book.

Part III, “System Administration,” is dedicated to common administrative tasks and how to perform them as efficiently as possible. After guiding you through user and group creation, deletion, and maintenance, it outlines best practices to consider when starting your user database. For large organizations such as enterprise-level companies, starting with solid, scalable rules for user names, home directory locations, and more will prove useful as the organization expands and as users come and go. Backup and administration scripts must be written and customized for your needs, and this part discusses backup concepts, the Amanda backup program in Red Hat Enterprise Linux, the basics of writing scripts, and how to automate the execution of scripts on Linux.

Network services are what differentiate server and client systems. Part IV, “Network Services,” teaches administrators how to configure network services for tasks such as user authentication and file sharing. Each chapter in this part is organized in a similar format so you can quickly find the information you are looking for.

System administrators are constantly monitoring multiple systems and learning new ways to tune their systems to accommodate their users. Discovering problems before the system goes down is key to avoiding downtime. Part V, “Monitoring and Tuning,” explores the multitude of Linux utilities available for monitoring and tuning. This part is divided into three chapters, or three subcategories of monitoring and tuning applications: system resources, the kernel, and applications.

Finally, Part VI, “Security,” introduces a relatively new security-prevention feature in Red Hat Enterprise Linux called Security-Enhanced Linux, or SELinux for short. The part includes information for configuring a firewall using IPTables as well as a chapter on the Linux Auditing System for logging specific actions such as system calls.

This book also includes four appendixes: “Installing Proprietary Kernel Modules,” “Creating Virtual Machines,” “Preventing Security Breaches with ExecShield,” and “Troubleshooting.” If you find yourself having to use a kernel module not provided with Red Hat Enterprise Linux, read Appendix A for how it is recognized by the operating system and some tips when using it. The last appendix is organized into the same six

parts mentioned earlier. It is designed to help you find answers to questions should you get stuck along the way. It also includes a few helpful hints about commands that didn't fit in the rest of the book.

Conventions Used in This Book

Every book uses a slightly different method for formatting text so that the reader can better understand it. In a technical book like this one, it is especially important because commands must be typed verbatim and you need to be able to follow the examples to fully understand the concepts.

- ▶ When commands are shown, the command prompt is omitted to eliminate confusion. When a command is given, type everything shown. For example, type the following command to view the current kernel version:

```
uname -r
```

- ▶ In commands or sample output, pointy brackets are used around the parts of the command or output that should be replaced by user-specific data such as an IP address or user name:

```
ssh <ipaddr>
```

- ▶ All code, computer output, commands, and filenames are typeset in a special mono-space font.
- ▶ Throughout the book, short paragraphs of text are highlighted for emphasis. These callouts can be in one of three forms:

NOTE

Notes are used to provide small bits of extra information such as books or websites with additional information.

TIP

A tip can be an alternate way of performing an action or a way to improve on a particular process.

CAUTION

Read cautions carefully. They highlight important information crucial to the success of the action being described or provide warnings about actions that might cause problems.

Feedback and Corrections

Despite the number of times I tested each procedure and command in this book, I'm sure there are parts that can be improved or just plain errors. For a list of corrections, supplemental material, or to submit feedback and corrections, go to the author's website for this book:

<http://www.linuxheadquarters.com/rhel5adminbook/>

Updates and additional information regarding the book can also be found on the publisher's website:

<http://www.sampublishing.com/>