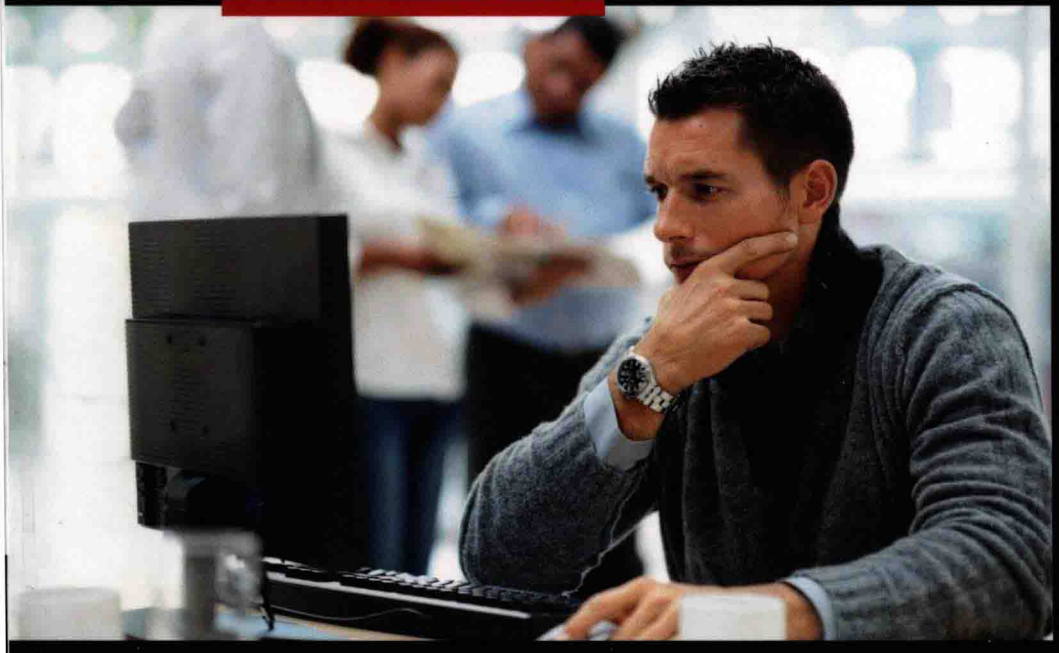
Red Hat® Enterprise Linux® 6 Administration

Real World Skills for Red Hat Administrators



Sander van Vugt

SYBEX SERIOUS SKILLS.

Red Hat®
Enterprise Linux® 6 Administration
Real World Skills for Red Hat Administrators

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Sander van Vugt

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To Florence, my loving wife of 20 years who supports me and believes in everything I do. Chérie, I'm looking forward to spending the next 60 years of our lives together.

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About the Author

Sander van Vugt is an author of more than 50 technical books. Most of these books are in his native language of Dutch. Sander is also a technical instructor who works directly for major Linux vendors, such as Red Hat and SUSE. He specializes in high availability and performance issues in Linux. He has also built up a lot of experience in securing servers with SELinux, especially on platforms that don't support it natively. Sander has applied his skills in helping many companies all over the world who are using Linux. His work has taken him to amazing places like Greenland, Utah, Malaysia, and more.

When not working, Sander likes to spend time with his two sons, Franck and Alex, and his beautiful wife, Florence. He also likes outdoor sports, in particular running, hiking, kayaking, and ice-skating. During these long hours of participating in sports, he thinks through the ideas for his next book and the projects on which he is currently working, which makes the actual writing process a lot easier and the project go more smoothly.

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Introduction

Red Hat is the number-one Linux vendor on the planet. Even though official figures have never been released, as the first open source, one-billion dollar company, Red Hat is quite successful in enterprise Linux. More and more companies are installing Red Hat servers every day, and with that, there's an increasing need for Red Hat skills. That is why I wrote this book.

This book is a complete guide that contains real-world examples of how Red Hat Enterprise Linux should be administered. It targets a broad audience of both beginning and advanced Red Hat Enterprise Linux administrators who need a reference guide to learn how to perform complicated tasks.

This book was also written as a study guide, which is why there are many exercises included in the book. Within each chapter, you'll find step-by-step exercises that lead you through specific procedures. Also, in Appendix A at the end of the book, you'll find lab exercises that help you wrap up everything you've learned in the chapter.

Red Hat offers two certifications that are relevant for system administrators: Red Hat Certified System Administrator (RHCSA) and Red Hat Certified Engineer (RHCE). This book does not prepare for either the Red Hat RHCSA or RHCE exams, but it does cover most of the objectives of both exams. For those interested in taking RHCSA and RHCE exams, it is recommended that you also attend a Red Hat training course, where the learner risks meeting the author of this book who has been a Red Hat Certified Instructor for many years now.

Who Should Read This Book?

This book was written for Red Hat administrators. The book is for beginning administrators as well as those who already have a couple of years of experience working with Red Hat systems. For the advanced administrators, it is written as a reference guide that helps them set up services such as web servers, DNS and DHCP, clustering, and more. It also contains advanced information, such as a long chapter on performance optimization.

What You Need

To work with this book, you need a dedicated computer on which you can install Red Hat Enterprise Linux. If this is not feasible, a virtual machine can be used as an alternative, however this is absolutely not recommended, as you won't be able to do all the exercises on virtualization. To install Red Hat Enterprise Linux and use it as a host for KVM virtualization, make sure that your computer meets the following minimum criteria:

- 64-bit CPU with support for virtualization.
- At least 2GB of RAM is recommended. (It will probably work with 1GB, but this is not recommended.)

- A DVD drive.
- A hard disk that is completely available and at least 40GB in size.
- A network card and connection to a network switch.

What Is Covered in This Book?

Red Hat Linux Enterprise 6 Administration is organized to provide the knowledge that you'll need to administer Red Hat Enterprise Linux 6. It includes the following chapters:

Part I: Getting Familiar with Red Hat Enterprise Linux

Chapter 1, "Getting Started with Red Hat Enterprise Linux" This chapter introduces Red Hat Enterprise Linux and explains its particulars. You'll also learn about the value added by this commercial Linux distribution as compared to free Linux distributions. In the second part of this chapter, you'll learn how to install Red Hat Enterprise Linux. You'll also get a quick introduction to the workings of the graphical user interface.

Chapter 2, "Finding Your Way on the Command Line" This chapter introduces you to working on the command line, the most important interface you'll use to manage your Red Hat Enterprise Linux server.

Part II: Administering Red Hat Enterprise Linux

Chapter 3, "Performing Daily System Administration Tasks" In this chapter, you'll learn about some common system administration tasks. This includes mounting and unmounting file systems, setting up and managing a printing environment, and scheduling jobs with `cron`. You'll also learn how to do process administration and make backups.

Chapter 4, "Managing Software" In this chapter, you'll learn how to install software. You'll also read how to manage software, which includes querying software packages to find out everything you need to know about installed software. You'll also read how to set up the repositories that you'll need for an easy way to install and manage software.

Chapter 5, "Configuring and Managing Storage" This chapter teaches you how to set up storage. It includes information about managing partitions, logical volumes, and encrypted volumes. You'll also learn how to set up automatic mounting of volumes through `fstab` and how to create and manage swap space.

Chapter 6, "Connecting to the Network" Here you'll learn how to connect your server to the network. The chapter addresses setting up the network interface, both from the command line and from the configuration files. You'll set up normal network connections, and you will also learn how to create a bonded network interface. Finally, you'll learn how to test your network using common utilities such as ping and dig.

Part III: Securing Red Hat Enterprise Linux

Chapter 7, "Working with Users, Groups, and Permissions" To manage who can do what on your system, you'll need to create users and put them in groups. In this chapter, you'll learn how to do that and how to add users to primary and secondary groups. You'll also learn how to work with basic and advanced permissions and set up access control lists.

Chapter 8, "Understanding and Configuring SELinux" This chapter teaches you how to make your Red Hat Enterprise Linux server really secure using SELinux. You'll learn about the different modes that are available and how to set file system context labels and Booleans to tune SELinux exactly to your needs.

Chapter 9, "Working with KVM Virtualization" Red Hat Enterprise Linux offers virtualization capabilities by default. In this chapter, you'll learn how to set these up using KVM virtualization. You'll learn what your server needs to be a KVM host, and you'll read how to create and manage virtual machines.

Chapter 10, "Securing Your Server with iptables" iptables is a kernel-provided firewall, which blocks or allows access to services configured to listen at specific ports. In this chapter, you'll learn how to set up the iptables firewall from the command line.

Chapter 11, "Setting Up Cryptographic Services" In this chapter, you'll learn how to set up cryptographic services on Red Hat Enterprise Linux. You'll learn how to configure SSL certificates and have them signed by a certificate authority. You'll also learn how to use GPG for file and email encryption and security.

Part IV: Networking Red Hat Enterprise Linux

Chapter 12, "Configuring OpenLDAP" If you really need to manage more than just a few users, using a directory service such as OpenLDAP can be handy. In this chapter, you'll learn how to set up OpenLDAP on your server. You'll also learn how to add user objects to the OpenLDAP server and how to configure your server to authenticate on OpenLDAP.

Chapter 13, "Configuring Your Server for File Sharing" This chapter teaches you how to set up your server for file sharing. You'll learn about common file sharing solutions, such as FTP, NFS, and Samba. You'll also learn how to connect to servers offering these services from Red Hat Enterprise Linux.

Chapter 14, "Configuring DNS and DHCP" In this chapter, you'll read how to set up a Dynamic Host Configuration Protocol (DHCP) server to automate providing computers in your network with IP addresses and related information. You'll also learn how to set up Domain Name System (DNS) on your servers, configuring them as primary and secondary servers, as well as cache-only servers.

Chapter 15, "Setting Up a Mail Server" Postfix is the default mail server on Red Hat Enterprise Linux. In this chapter, you'll learn how to set up Postfix to send and receive email on your server. You'll also learn how to set up Dovecot to make email accessible for clients using POP or IMAP.

Chapter 16, "Configuring Apache on Red Hat Enterprise Linux" In this chapter, you'll learn how to set up Apache on your server. You'll learn how to configure basic hosts, virtual hosts, and SSL secured hosts. The chapter also teaches you how to set up file-based or LDAP-based user authentication.

Part V: Advanced Red Hat Enterprise Linux Configuration

Chapter 17, "Monitoring and Optimizing Performance" For your server to function properly, it is important that it performs well. In this chapter, you'll learn how to analyze server performance and how to fix it if there are problems. You'll also read some hints about setting up the server in a way that minimizes the chance of having performance-related problems.

Chapter 18, "Introducing Bash Shell Scripting" Every Linux administrator should at least know the basics of shell scripting. This chapter teaches you how it works. You'll learn how to set up a shell script and how to use common shell scripting structures to handle jobs in the most ideal manner.

Chapter 19, "Understanding and Troubleshooting the Boot Procedure" Many tasks are executed sequentially when your server boots. In this chapter, you'll learn about everything that happens during server startup, including GRUB configuration and the way Upstart is used. You'll also learn how to troubleshoot common issues that you may encounter while booting your server.

Chapter 20, "Introducing High-Availability Clustering" In a mission-critical environment, the Red Hat High Availability add-on can be a valuable addition to your datacenter. In this chapter, you'll learn how to design and set up high availability on Red Hat Enterprise Linux.

Chapter 21, "Setting Up an Installation Server" In a datacenter environment, you don't want to set up every server manually. This is why it makes sense to set up an installation server. This chapter teaches you how to automate the installation of Red Hat Enterprise Linux completely. It includes setting up a network installation server and configuring a TFTP server that hands out boot images to clients that perform a PXE boot. You'll also learn how to create a kickstart configuration file, which passes all parameters that are to be used for the installation.

Glossary This contains definitions of the relevant vocabulary terms in this book.

How to Contact the Author

If you want to provide feedback about the contents of this book or if you're seeking a helping hand in setting up an environment or fixing problems, you can contact me directly. The easiest way to get in touch with me is by sending an email to `mail@sandervanvugt.nl`. You can

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