Chapter 1

Getting Acquainted with Enterprise Linux

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Enterprise Linux has four versions: Two of the versions are designed for workstation and desktop usage, and the other two versions are designed for server applications. Don't get too bogged down trying to sort out the differences of these versions because the four versions of Enterprise Linux are really quite similar. In this chapter, I examine the different versions of Red Hat Enterprise Linux and what you can do with them. Before I go into the version descriptions, take a look at the history of Enterprise Linux.

Exploring the History of Enterprise Linux

Red Hat Enterprise Linux is one of many available distributions of Linux. Several companies make their own commercial Linux distributions, but in this book, I discuss the Enterprise Linux distribution by Red Hat. A *Linux distribution* is a complete version of the Linux operating system that contains the Linux kernel as well as other applications and programs that can be used for doing some type of work. The Linux *kernel* is the core of the Linux operating system and controls how the operating system functions with the hardware that makes up your PC. (Linux was originally developed by Linus Torvalds in 1991 while he was a college student in Finland.)

I don't want to bore you with a lot of historical information about Enterprise Linux, but a little background information for a better understanding of the Linux kernel and version numbers is helpful. Exact dates aren't important, so I'll just give you the quick rundown of the history of Red Hat Linux and the introduction of Enterprise Linux.

The first publicly available version of Red Hat Linux appeared in the summer of 1994 and was based on kernel version 1.09. (The kernel is identified by a number that refers to the particular version of the kernel.) Since the release of the first version of the Red Hat Distribution, there have been many more releases, with each release improving upon the earlier versions. Red Hat made no distinction between its version's suitability for home use or commercial (business) use of its distributions until May, 2002. By then, Red Hat was at release 7.3 of the Red Hat Linux distribution. Coinciding with the release of version 7.3 was the introduction of Red Hat Linux Advanced Server 2.1, which was renamed Enterprise Linux 2.1.

Enterprise version 2.1 was based on the Red Hat 7.3 version but was intended for commercial/business use. The major difference between the commercial and home versions of Red Hat Linux was in the support offerings available for the versions. The home version, if purchased through a boxed set, gave the user a limited number of technical support calls for a short time period, and then the users were on their own. The commercial version provided a longer time period for technical support and offered additional technical support that could be purchased at additional cost. Also, Red Hat had issued a new version of its operating system about every six months — changing far too often for most commercial uses. With the release of Enterprise Linux 2.1, Red Hat slowed the pace of system changes to give users a more stable platform (thus requiring less frequent updates) and focused its commercial efforts on the Enterprise version.

From this point forward, Red Hat continued development of its home user versions through version 8 and finally version 9, which was the last Red Hat distribution that was available for home user purchase. In the summer of 2003, Red Hat decided that it would merge its open development process with the Fedora Linux project — and the Fedora Project was born.

In October, 2003, Red Hat introduced Enterprise 3 that, like its predecessor Enterprise 2.1, was specifically geared toward business/enterprise users. Enterprise 3 was initially available in three versions — AS, ES, and WS — each designed for specific types of service. In the summer of 2004, Red Hat added another version of Enterprise 3 specifically for the desktop. That brings us to the present — Enterprise version 4 — which is the focus of this book.

Examining the Versions of Red Hat Enterprise

All versions of Enterprise Linux share some similarities in their product features. The most significant of these features are

- A 12–18 month release cycle
- A common operating system, applications, and management tools

- One year of support and updates using the Red Hat Network included with the initial purchase, which is then renewable annually for 5 years for an additional yearly fee

Having a 12–18 month release cycle makes the update process more predictable because a user knows that he won't have to make any major changes to his system configuration for at least a year and perhaps longer. With all versions are based on the same operating system, a system administrator can more easily configure and maintain consistency because the same skill set is used for all versions.

Probably the most significant feature of Enterprise Linux is the level(s) of support available from Red Hat. One of the most frequently heard criticisms of Linux is the lack of user support typically available. With Enterprise 3, and Enterprise version 4 covered in this book, Red Hat has seriously addressed the support issue.

In the following sections, I examine the different versions of Enterprise Linux 4. (For installation details, see Appendix A.) Then I conclude the chapter the remainder of this chapter with what Enterprise Linux can do for you.

Red Hat Enterprise AS

Red Hat Enterprise AS is the top-of-the-line server operating system available from Red Hat. Enterprise AS is designed for large departments or company data centers. The AS version provides the same server functions as the ES version but is best suited for servers that have more than two CPUs with greater than 8GB of system RAM. In addition to support for more than two CPUs in the same system, there is support for many different types of CPUs as well, such as the IBM iSeries, pSeries, and zSeries.

The greatest difference between the AS and ES (see the following section) versions is the level of support available with the AS version. Users can purchase the premium level support option that provides 24/7 support with a guaranteed one-hour response time.

Red Hat Enterprise ES

Red Hat Enterprise ES is intended to provide for an entry-level or midrange server environment with support for up to two CPUs and 8GB of system RAM. The ES version is quite similar to the AS version (see the preceding section) but is meant for smaller-scale operations and does not provide the same level

of support as the AS version. The ES version includes the following applications:

- Web server
- Network services (DNS [Domain Name System], DHCP [Dynamic Host Configuration Protocol], firewall security, and more)
- File/print/mail servers
- SQL (Structured Query Language) databases

Red Hat Enterprise WS

Red Hat Enterprise WS provides nearly the same functionality as the Desktop version. Included with WS are the same Web browser, office suite, and e-mail client (Firefox, OpenOffice.org 1.1, and Evolution, respectively). The major difference between the WS and Desktop (see the following section) versions is the number of CPUs supported. The WS version supports up to two CPUs, but the Desktop version supports only one.

Red Hat Desktop

According to Red Hat, Enterprise 4 Desktop is "a high-quality, full-featured client system for use in a wide range of desktop deployments where security and manageability are key." What does this mean to the typical user?

This version focuses on the desktop, containing applications that are used on the desktop. Red Hat Desktop includes a mail client program, similar to MS Outlook, called Evolution. Also included is the Firefox Web browser; a complete office suite, OpenOffice.org 1.1; and GAIM, which is an instant messaging client.

To find out more about some of the applications available in Enterprise Linux, take a look at Chapter 3.

Third-party productivity applications are also installed by default during the system installation. This is an improvement over earlier versions of Red Hat Linux. Adobe Acrobat Reader, a Macromedia Flash plug-in, RealPlayer, and Java are just a few of the applications that work in Red Hat Desktop right out of the box.

As part of the Enterprise family of programs, Red Hat Desktop shares many of the features and tools of the other Enterprise versions. A user or administrator who is familiar with one of the versions of Enterprise 4 will be able to easily use a different version. Red Hat Desktop supports a system with one CPU and up to 4GB of system RAM.

Putting Enterprise Linux to Work

Whether you're planning to use the AS or ES server versions of Enterprise Linux or you'll be using the WS or Desktop versions, the choices of productivity software and what you can do with them are nearly infinite. You can use Enterprise Linux to manage all your system hardware, do system administration, create networks for sharing data, browse the Internet, serve Web pages, and much more. Take a look at just some of the tasks that you can do with Enterprise Linux.

Configuring your local network

All versions of Enterprise Linux include the X Window System (find more on this in Chapter 5), based on XFree86, which provides the foundation for a graphical user interface (GUI). However, you aren't stuck with just one GUI because Enterprise Linux supplies two well-known GUIs: KDE and GNOME.

- **KDE:** The K Desktop Environment is an optional GUI that can be selected at installation time.
- **GNOME:** This is the default GUI that's installed when the operating system is installed.

If you have both GUIs installed, a tool on either desktop makes switching between the desktops very easy.

You don't have to spend additional money to buy typical productivity applications such as word processing or spreadsheet programs. All versions of Enterprise Linux ship with a complete office productivity suite — OpenOffice.org — as well as many other graphical applications that can be used for editing graphics, building Web sites, and much more.

With either desktop, you can use the included graphical-based tools to configure and maintain your systems. You can also configure the hardware in your system and add or remove devices.

Additionally, you can configure printers to work with your local network. Enterprise Linux includes support for many types of printers from different manufacturers. You can configure a printer connected directly to your system as well as many types of network-connected printers. (Read more about configuring system printers in Chapter 6.)

Enterprise Linux gives you everything you need to set up a local network so that your systems can share data with each other. For example, you can configure the AS and ES versions to provide local network services, such as Network File System (NFS), that shares files between the servers and WS and Desktop clients. (Read all about NFS in Chapter 8.) Or, you can configure the

Network Information System (NIS) to give your users the ability to log in to the network and use all the network resources.

You will also be able to share data with computers running other operating systems, such as MS Windows, Novell NetWare, or Mac OS X. (See Chapter 9 for more.) Enterprise Linux gives you all the tools that you need to configure your system to communicate with these other operating systems and exchange information.

Using Enterprise Linux to maintain your system

Keeping your systems running properly and updated with the latest patches can be a daunting proposition. Don't worry, though, because Enterprise Linux gives you all the tools that you need to perform these tasks. All versions of Enterprise Linux include a subscription to the Red Hat Network as well as the up2date application that constantly scans your system configuration and installed packages looking for packages that can be updated.

Tools are available in all versions that you can use to create and remove system users and groups. You use these same tools to change properties and permissions for your users and groups as well.

Several applications are available for creating file archives for backing up your data. You can compress your data to maximize your storage space and speed up your backup and restore process.

Installing application software in Enterprise Linux is a relatively easy process because most applications are available in the Red Hat Package Manager (RPM) format. You can use the graphical-based RPM tool to install your application, or you can use the `rpm` command from a command prompt. In many instances, you can either choose to use the graphical based tool or you can use the command line to enter your commands.

Read more about security basics in Chapter 10.

Securing your system

Anyone who uses a computer these days is well aware of the increasing problems caused by unsecured systems. Enterprise Linux includes many of the tools that you need to secure your system from malicious attacks.

You can configure a firewall on your system by making a few choices and answering a few questions from the graphical-based firewall tool. If you want to go into more detail with your firewall configuration, you can use

the command line firewall tool to create more complex firewall rules. You can protect your systems from *internal* attacks (attacks that originate inside your organization) as well as *external* (outside) attacks.

Applications are also available that you can use to actively detect system intrusions. You can configure how your system should respond to intrusions and what actions should be taken to ensure that your systems are not vulnerable to future attacks.

Find out more on intrusion prevention and detection in Chapter 11.

Providing Internet services

You can use Enterprise Linux to serve information across the Internet to users on different networks than your own. The ES and AS versions of Enterprise Linux include the following Internet servers:

- **Apache `httpd` Web server:** The Apache Web server is the most widely used Web server in use today. (See Chapter 15.)
- **FTP server:** The `vsftpd` server is an implementation of the File Transfer Protocol (FTP) that is used for transferring files across the Internet. (See Chapter 14.)
- `sendmail`**:** This is the most widely used mail transport agent in use today. (See Chapter 13.)

You can remotely log in to another computer on your own network or even on the Internet. Using the `telnet` program, or another more secure program called `ssh`, makes remote logins easy. After logging in remotely, you can control the remote computer as though you were sitting in front of it.

In Enterprise Linux, all Internet servers are based on the Transmission Control Protocol/Internet Protocol (TCP/IP), which is the protocol on which the Internet is based. Any network applications that use TCP/IP are supported natively by Enterprise Linux. (Read more on TCP/IP networking in Chapter 12.)

As you can see from this quick examination of the features of Enterprise Linux, you can do a lot with it. In fact, anything you can do with the most widely used operating system (MS Windows), you can do as well or better with Enterprise Linux. You systems will certainly be more secure and less vulnerable to attack if you are running Enterprise Linux. The remaining chapters of this book explain in more detail the features briefly discussed in this chapter.

Comparing Enterprise Linux and Fedora Core

In Fall, 2003, Red Hat announced that it would no longer sell nor support its retail box version of Red Hat Linux. Version 9 would be the last of many versions that I've seen over the years. Instead of continuing this long line of versions, Red Hat announced that it would provide support to the Fedora Project for development of what Red Hat described as a place for testing cutting-edge technology. What this means is that all development efforts for all Red Hat software would go into the Fedora Project and the Fedora software, which is known as *Fedora Core.* New releases of Fedora Core will occur about every six months, which is far too often for production-based systems, but allows for testing of features that would appear at some later date in the Enterprise versions. At the same time as the Fedora Project announcement, Red Hat placed nearly all its efforts into promoting its Enterprise Linux product and its features and benefits.

Many people were very confused by this move by Red Hat, and many users had a strong feeling that Red Hat Linux would no longer be available. This is simply not true. What was known as Red Hat Linux is simply now called Fedora Project. In my opinion, except for the name change and not being able to purchase a retail box version of Fedora, nothing has really changed as far as the features and functionality of the operating system.

The major advantages of Enterprise Linux over Fedora Core are the number of support options that are available from Red Hat. For many years, one of the biggest reasons given by the corporate world for not using Linux has been a lack of user support. With the promotion of Enterprise Linux, Red Hat has effectively removed lack of support as a reason for a company not to consider using Linux.

Another key feature of Enterprise Linux is the extended development and release cycle for new versions. Red Hat has stated that it plans to release new versions of Enterprise Linux every 12–18 months rather than every 6 months, as had been the case with Red Hat Linux.

However, probably the most significant difference between Fedora Core and Enterprise Linux is the difference in price. Purchasing the AS version of Enterprise Linux with the standard support option cost about $1,500, with the premium support package costing about $2,500. Fedora Core, on the other hand, is free.

What does all this mean to the users of Enterprise Linux or Fedora? Can you use Fedora Core to provide the same services and functionality as Enterprise Linux? The answer is a resounding yes. Users can do everything in Fedora that they can do with Enterprise Linux. This is good news to users of Enterprise Linux as well. Any user who is familiar with Fedora Core can easily make the move to Enterprise Linux because they are nearly identical in features and functionality.