

# Part I

## Getting Started

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## Chapter 1

# Why Red Hat Linux?

### IN THIS CHAPTER

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WHEN IT COMES TO SERVER OPERATING SYSTEMS, you have two worlds to consider: UNIX and Windows. Other server-class operating systems exist, but these two dominate the market. Whenever someone talks about servers, the issue of UNIX versus Windows arises in the conversation. The umbrella word *UNIX* covers many operating systems, Linux among them, even though Linux is not strictly a form of UNIX. The decision to choose UNIX over Windows NT or vice versa is often influenced by such factors as the buyer's background, the organization's IT capabilities, and its policies and politics.

Because you are reading this book, I assume that you or your organization has already decided to choose the UNIX path after either a quick and intelligent thought cycle or a long battle of UNIX versus Windows. Either way, here you are reading a book on Red Hat Linux. In this chapter, I plan to convince you that Red Hat Linux is the right choice for your server system. Before I go any further, take a brief look at the history of Linux.

## The First Linux Decade

On October 5, 1991, Linus Benedict Torvalds, a graduate student from the University of Helsinki in Finland, announced in a Usenet newsgroup (`comp.os.minix`) that he had created a small UNIX-like operating system called Linux. The new operating system was inspired by another small UNIX operating system called Minix that was developed by Andy Tanenbaum. Although you would guess that this announcement was about Linux version 0.01, it wasn't! In fact, Linux 0.01 was never announced because 0.01 was not executable; Torvalds provided only the source of this version in the first Linux FTP site at `ftp://nic.funet.fi`.

The October 5 announcement from Torvalds referred to version 0.02, which was capable of running the GNU Bourne Again Shell (bash), the GNU C compiler (gcc), and not much of anything else. Torvalds never knew that what he envisioned as an operating system for kernel hobbyists and hackers would turn into what is now known as Linux.

Linux started with version 0.02, proceeded to version 0.03, and then jumped to version 0.10. As more and more programmers around the world started developing Linux, it reached version 0.95. This indicated that the official release of version 1.0 was very near. The official version 1.0 was released in March 1992. As of this writing, the latest stable version of the Linux kernel is 2.4.19.

Today, Linux has moved into the spotlight as a complete UNIX-like operating system. In recent days, Linux has received an enormous amount of media coverage. It has become a breath of fresh air in the OS arena and is no longer the tiny hobbyist project that Torvalds initially created. Linux is not simply a challenger to other so-called mainstream operating systems; it has become the one to beat.

Linux runs virtually all the respectable free software that organizations such as GNU make and performs better than many expensive commercial operating systems. Although Intel x86 machines are the primary target platform, Linux has been ported to various other hardware platforms, including Sparc, Alpha, and Macintosh. In short, Linux is no longer thought of as the delightful dream of programmers who like to hack kernel code and want a low-cost, open-source operating system for at-home hacking. This has all changed. Linux is now everywhere.

In truth, most large organizations already have a heterogeneous server environment. Adding Linux to such an environment becomes a no-brainer due to the low-cost and open-source nature of the beast.

By now, many companies and individuals have taken the Linux kernel and bundled free and commercial software to create useful distributions of Linux. These distributions all share the same kernel code but provide value-added features in the installation, configuration, and application areas. Take a look at a few of the commonly available Linux distributions.

## Other Major Linux Distributions

Many distributions other than Red Hat are available for Linux. Red Hat Linux is obviously my favorite and perhaps yours as well. The differences between the distributions are mainly in the following areas:

- ◆ **Installation:** Installation procedures range from completely manual to semiautomatic. One distribution may expect the user to create boot disks, but another such as Red Hat may supply disks or allow booting straight from a CD-ROM. One may have a minimal installation program, and another such as Red Hat may have a user-friendly menu-driven installation interface.

- ◆ **Ease of configuration:** Some distributions of Linux provide no configuration tools and expect you to edit configuration files manually to configure a system. Other distributions provide graphical user interface (GUI)-based tools to ease configuration tasks.
- ◆ **Bundled software:** One distribution may bundle hundreds of software packages in the main distribution, and another may bundle only a manageable set of software and provide the rest via FTP or other means.
- ◆ **X Window system:** One distribution may provide auto-probing of your video hardware to ease X Window system configuration, and another may require you to modify X Window system configuration files.
- ◆ **Support:** Support is a big issue for commercial users. If you want commercial support for a distribution, you will find that the available choices are narrowed to only a very few.

Although this book is about Red Hat Linux, I think it is important for you to know how other Linux distributions differ from Red Hat Linux. In the following section, I discuss briefly a few popular Linux distributions from this point of view.

## Caldera OpenLinux

If I had to choose a Linux distribution in the absence of Red Hat Linux, it would be Caldera's OpenLinux. I consider it the second-best Linux distribution for new users and businesses. The original Caldera distribution was created by the Linux Support Team (LST) in Germany, which later became part of Caldera.

This distribution is intended for businesses and offers a variety of commercial packages such as a secure Web server and the StarOffice Office Suite (a word processing program, a spreadsheet program, drawing programs, and so forth), DR-DOS (a DOS-like operating system that can be run using the DOSEMU emulator program), NetWare 3.x & 4.x Administration Utilities, and more. In many aspects, this is a very commercial version of Linux.

Because Caldera's target customers are mainstream businesses, it provides great support packages and also has one of the most powerful reseller programs. Caldera now has a per-seat licensing schema and it uses RPM packaging technology developed by Red Hat. You can find more information on this distribution on the Internet at [www.calderasystems.com/products/openlinux](http://www.calderasystems.com/products/openlinux).

## Slackware Linux

Slackware is one the oldest distributions of Linux. Although I started my Linux experience with a Slackware distribution in the early days of Linux, I do not recommend this distribution for new Linux users because it requires a more hands-on, textual configuration than Red Hat Linux.

Slackware may be a great distribution for someone who wants to play kernel hacker or who likes a do-it-yourself approach to things. In short, it is not for the fainthearted. Slack, the cute, short name given to the distribution by its followers, does not use any packaging schemes, so all the packages come in `tar` files. This system could be quite a problem for new users, and it also poses a big problem when it comes to upgrading the operating system or other parts of the distribution. You can use a program called `pkgtool` to keep track of `tar`, `tar.gz`, and related files, however.

Slackware is distributed by Walnut Creek CDROM. You can find more information about it on the Internet at [www.slackware.com](http://www.slackware.com).

## Debian GNU/Linux

Unlike Red Hat Linux, which is a commercial distribution of free Linux, the Debian GNU/Linux distribution is also free. Although Linux is primarily developed by programmers around the world, most Linux distributions are created by a tightly connected group of people. For example, Red Hat has its own staff to handle distribution issues. However, the Debian GNU/Linux distribution relies solely on a team of volunteers. The main distribution of Debian GNU/Linux is larger than Red Hat because it includes packages that Red Hat considers contributed software and does not include in the official Red Hat distribution.

The Debian GNU/Linux distribution uses its own packaging scheme. It comes with the `dpkg` package manager for packages using the `.deb` format, along with `dselect` and `apt` as the package management tools. Although the RPM (Red Hat Package Management) technology developed by Red Hat has become the main-stream packaging solution for many Linux distributions and other UNIX software, the Debian packaging scheme does have some interesting features, such as the capability to download Debian GNU/Linux packages automatically, upgrade the distribution, and keep the software packages up-to-date. Personally, I consider this distribution to be the most relaxed and ideologically motivated Linux distribution. Because all developers are volunteers, there is no commercial pressure to release a version before it is really done. A new release is made public only if every milestone set forth by the team has been met. This also means that a release could be delayed if a volunteer gets involved in some other real-life matter. When a new release of Debian GNU/Linux comes out, however, it tends to have few problems, if any.

No official support is available from the nonprofit Debian Organization. You can find more information on this distribution on the Internet at [www.debian.org](http://www.debian.org).

## SuSE

SuSE, a distribution based in Germany, comes with a nifty, SwissArmy-type central administration and installation tool called YaST (Yet another Setup Tool). An extensive set of packages is part of the main distribution. Many such packages are available for Red Hat as contributed software in `ftp://contrib.redhat.com`. Also note that this distribution includes cryptographic software, such as `ssh`, `Apache-SSL`, and

PGP, that have legal export restrictions in the United States. This means that the SuSE distribution available in the United States is not the same as the non-U.S. version. This distribution also uses RPM packaging scheme.

You can find more information on this distribution on the Internet at [www.suse.com](http://www.suse.com).

## Other Linux distributions

Other mainstream Linux distributions include Eonova Linux, Mandrake Linux, Stampede GNU/Linux, TurboLinux, and Xi Graphics maXimum cde/OS. Other specialized mini-Linux distributions focus on very low-end hardware to provide valuable single-purpose services. I personally find these very interesting because they often provide quick-and-dirty ways of getting much of the system administrative work done. In the following section, I briefly discuss a few of these gems.

### TRINUX

Trinux boots from several (two or three) disks (or a MS-DOS/Windows 9x partition) and runs entirely in RAM. It comes with the latest version of many network security tools such as NETWATCH, tcpdump, and netmon, which are very useful for TCP/IP port scanning and monitoring networks. Such a distribution of Linux turns an old x86 PC into a powerful network security management workstation. For more information on Trinux, go to the following URL: [www.trinux.org](http://www.trinux.org).

### LINUX ON A FLOPPY (LOAF)

LOAF fits on a single high-density (1.44MB) floppy disk and acts as simple network client system. More information on this distribution can be found at the following URL: [www.ecks.org/loaf/](http://www.ecks.org/loaf/).

### LINUX ROUTER PROJECT

Linux Router Project is yet another single-floppy (1.44MB) Linux distribution; it turns an ordinary old x86 system into a router using the gated daemon. You can find the distribution at the following FTP site: <ftp://sunsite.unc.edu/pub/Linux/distributions/linux-router/>.

Linux distributions are available for several different processor architectures. In fact, Red Hat Linux supports Alpha and Debian. GNU/Linux has stable ports for Alpha and Motorola 68K architectures. Versions of Linux for PowerPC machines, such as PowerMacs, are available from MkLinux and LinuxPPC. Linux for UltraSPARC machines is available from UltraPenguin.

If you are interested in learning more about all the available Linux distributions, try the following URLs:

- ◆ [www.linuxhq.com/dist-index.html](http://www.linuxhq.com/dist-index.html)
- ◆ [www.linux.org/dist/index.html](http://www.linux.org/dist/index.html)

## Why Red Hat Is the Best

If you must ask the question, “How do you know that Red Hat is the best?” the answer is, “Because Linus Torvalds himself uses it!” Although it is true that Linus now uses Red Hat Linux, the true answer to the question should be clear from the following discussion.

As you may have realized from the discussion of the various distributions, practically the same Linux kernel code is used in them all. What differentiates the mainstream distributions is the ease of installation, ease of configuration, and breadth of user-level applications. Red Hat’s excellence in these respects makes it the most popular Linux distribution.

Red Hat is committed to making Linux usable for the masses. For Linux to be accepted by large numbers of computer users, it must have a certain degree of user friendliness. Red Hat is working hard and fast to make Linux commonplace in the operating system arena. So far, all indications are that it is making great progress toward that goal.

### Fighting the negative view of ease-of-use

If you ask a serious Linux user who does not use Red Hat Linux why she prefers a different distribution like Slackware, chances are that she will say that Red Hat tries to make things too simple in terms of installation and configuration. This ease-of-use apparently turns a few so-called gurus away from Red Hat Linux. That’s unfortunate. If Linux is to be a successful operating system, it has to be user-friendly and usable by everyone – from beginners to the most advanced users. Red Hat Linux does that just fine. If you crave total control and want to configure everything manually, go ahead! Red Hat Linux does not stop you from doing any such thing after you have installed it. Red Hat places no restrictions on compiling your kernel or configuring the network by hand. So the misconception that Red Hat hides configurations from the user is ill-founded. The installation is easy enough that anyone can install it. Once Red Hat is installed, you can choose to use GUI tools or manually configure anything you want.

The packaging scheme, Red Hat Package Management (RPM), was invented by the company and is surely one of the most interesting packaging schemes currently available for software distribution. As you may know, many other distributions also use RPM to manage packages.

By providing a simple and elegant method of installation, Red Hat targets everyone as potential Linux users, whereas the other distributions focus on particular classes of users. For example, Caldera OpenLinux apparently targets small businesses to large enterprises, and Slackware Linux targets the veteran experts on UNIX or UNIX-like operating systems, but Red Hat targets both consumers and businesses.

Red Hat has succeeded in creating a great momentum for Linux. Because of its ease of installation, ease of configuration, and commercial support options, many people are running Linux or considering it as an option. Even the biggest critics of Red Hat will credit the company with this achievement.

## Strengthening Red Hat Linux's position

Efforts are under way to strengthen Red Hat Linux's position on all fronts. Red Hat has turned its official Web site ([www.redhat.com](http://www.redhat.com)) into a Linux portal to centralize all Linux happenings to a single Web-based source on the Internet. Because this is done with other popular Linux Web sites, it is sure to become the single source of Linux information and software for millions of Linux users all around the world.

Such efforts are empowered by the involvement of various software and hardware giants such as IBM, HP, Informix Corporation, Oracle, Corel Corporation, SAP AG, Computer Associates International, Inc., and Intel. In fact, Compaq, IBM, Novell, and Oracle have taken equity positions in Red Hat to help bring Red Hat Linux to their customers. This should give you a good idea about where Red Hat is headed.

Now consider the benefits of the Red Hat Linux distribution. You get the most stable version of the Linux kernel, along with many GNU applications. Red Hat itself provides various configuration tools for both the X Window system and the character-based displays. The official Red Hat CD-ROMs also include various commercial applications available free for personal use or in demo form for commercial use.

Technical support has always been a big issue with corporations. Knowing that, Red Hat offers Response Link, a 24/7 technical support facility located at the company's headquarters. The available support packages include toll-free phone calls from anywhere in the United States and priority support services.

As you can see, Red Hat is in the Linux game for real and in a big way. It clearly offers the strongest, most viable distribution currently available on the market.

## Red Hat Linux as a Server OS

In an ideal world, the best operating system wins all the server accounts. Unfortunately, we do not live in such a world. Instead, we live in a world where marketing is often more important than the actual product. Many of us buy what we have heard of or know about from the media or by some other means. Most people are uncertain about trying new ideas or backing one when their jobs are on the line. This truth allows a handful of operating system giants (you know who they are) to control the entire server market.

Most IT managers are by default risk-resistant, even when the risk is slight. This reluctance to try the unknown is a big barrier Linux must overcome if it is to become a giant in the server operating system market. Thanks to Red Hat, however, this attitude is changing rapidly. Because many computer giants have shown great interest in Red Hat Linux, it is becoming easier for IT professionals everywhere to put Linux in their proposals and try it out.

### A reliable server platform

Those of us who are bold enough to try Linux as a server know that it is the ideal server platform. Like many people, I have run Linux servers for years with a very

high degree of reliability. Many system administrators run Linux servers that have not been rebooted once in over a year! That's how reliable Linux servers can be. The low-cost, high reliability, and 24/7 support options make Red Hat Linux a great server platform.

One of the reasons Red Hat Linux excels over other server platforms like Windows 2000 is that it takes advantage of the tried and proved software that the UNIX platform has to offer. For example, Red Hat Linux runs the most popular Web server, Apache, even though Apache was not primarily developed for Linux. Linux's strong ties with UNIX operating systems make it simple to port the greatest UNIX applications to Red Hat Linux, much easier than to Windows XP/2000 (Windows NT).

The granddaddy of SMTP mail servers, sendmail, was ported to Red Hat Linux a long time ago. Server applications like these make Red Hat Linux a great choice. When you run the good old BIND DNS server on Linux, you know that the software has been around for a long time and therefore has a track record you can count on.

Because Red Hat Linux runs virtually all great UNIX server applications, it automatically inherits many of the advantages of such software. This claim is one that Windows 2000 is not likely to be able to make. On top of this, it is often said that Linux does Windows platform-specific file services (SMB services) better than the Windows platform itself! In other words, you are likely to create a more responsive and reliable file server from a Red Hat Linux system than you are from the Windows alternative.

## Figuring out the cost

You also can use economics to simplify your server platform decision. Using the Web and the Usenet as your research tools, find the kind of hardware that people (not the vendors) recommend to implement a server using anything other than Linux. The Windows XP/2000 hardware recommendation might scare a few people. You will find that RAM requirements are in triple digits of MB. The clock speed of the recommended CPU might be in multiple hundreds of MHz.

Some people might argue that hardware prices have gone so low that these numbers won't scare many companies. But this is true only if you are investing in a single server. What if you need to deploy several of these beasts to create an IT infrastructure? The figures quickly add up and the totals can hurt quite a bit. Also do not forget that many of the so-called commercial server operating systems have a hard limit on the number of users (or even network connections) that you can service using a license. And do not overlook the cost of maintenance and expensive support packages needed. When you add all these up, Red Hat Linux looks great.

A Red Hat Linux purchase gives you a great return on your hardware investment. Because Linux is primarily developed by people all around the world who do not always have the greatest and the latest hardware, it runs very well on even a very low-end system. This means that your hardware does not become obsolete as often as your hardware vendor wishes it. In this way, you can get a big bang for every hardware buck you have spent.

Hopefully you now know why Red Hat Linux can be a great server platform, and you are eager to try it first-hand. One of the most important things you must do as a future Red Hat Linux system administrator is to keep yourself up-to-date on developments in the Linux front. In Appendix C, you can find out about many of the most commonly used Linux resources on the Internet.

The next step is to get the Red Hat Linux distribution.

## How to Get Red Hat Linux

You can acquire Red Hat Linux several ways. For example, you can simply download Red Hat Linux from the official Red Hat Linux FTP server or any of its mirror FTP sites.



I often cannot access the Red Hat FTP server (<ftp://ftp.redhat.com>) because it appears to be very busy at all times. If you have the same experience, try [www.redhat.com/mirrors.html](http://www.redhat.com/mirrors.html) for a list of mirror FTP sites near you.

If you have a fast Internet connection (that is, not a modem connection), you may want to download the latest version of Red Hat Linux that way.

The Web site that accompanies this book includes a link to Red Hat Linux 8.0. If this is still the latest version, go ahead and use it. If you find out that this is not the latest version and you do not have a fast connection to the Internet, you can order the official Red Hat CD-ROM via Web, phone, or fax. Check the Red Hat Web site for details on how to place your order. You can also buy cheap versions of Red Hat Linux from [www.cheapbytes.com](http://www.cheapbytes.com) or [linuxmall.com](http://linuxmall.com).

When you have a copy of the Red Hat Linux distribution, you are all set to proceed with installation, which is the subject of the next chapter.

## Summary

In my personal experience, Red Hat Linux is a breath of fresh air because it is open-source, highly configurable, and very stable. Many users find that Red Hat Linux-based servers run for years without needing a single reboot! That is a far cry from the NT environment, where daily or (if you're lucky) weekly or (if you're *very* lucky) monthly reboots are commonplace.

I hope you are now convinced that you have made the right decision and want to continue exploring and implementing the greatest server – Red Hat Linux server. Begin the journey by starting with the installation of Red Hat Linux in the next chapter. Good luck.