



Welcome!

If you're an avid computer user, there's a good chance that you've heard of Linux. You might have read about it, or perhaps you've seen TV ads that refer to it.

One of the odd things about Linux is that the more you learn about it, the more questions you have. For instance, it's generally thought that Linux is free of charge, but this then raises the question of how, in our modern world, something like an entire computer operating system can cost nothing. Who pays the programmers?

Over the following introductory chapters, we're going to try to answer some of these questions. In this chapter, we'll explain what Linux is and its benefits compared to Windows.

What Is Linux?

There are two ways of looking at a PC. The first is to see it as a magical box, which lets you do cool stuff like browse the Internet or play games. Seen in this way, it's like a VCR—put in a tape, press a button, and a picture appears on your TV. On your PC, you click the Internet Explorer icon, type a web address, and a web site somehow appears. The astonishing technical complexity behind these simple procedures isn't important to most people.

The other way of looking at a PC is as a collection of components that are made by various manufacturers. You might be familiar with this way of thinking if you're ever tried to upgrade your PC's hardware. In that case, you'll know that your PC consists of a CPU, a hard disk, a graphics card, and so on. You can swap any of these out to put in newer and better components that upgrade your PC's performance or allow more data storage.

What almost no one realizes is that the operating system is just another component of your PC. It, too, can be swapped out for a better replacement. Windows doesn't come free of charge, and Microsoft isn't performing a public service by providing it. Around \$50 to \$100 of the price you pay for a PC goes straight into Microsoft's pocket. Bearing in mind that hundreds of millions of PCs are made each year, it's not hard to see why Microsoft is one of the world's richest corporations.

It would be difficult to question this state of affairs if Microsoft gave us our money's worth. But it often falls far short. Its products are full of serious security holes, which at best inconvenience us and at worst make us lose data.

Microsoft became rich, and maintains its wealth, by a virtual monopoly over PC manufacturers. While the intelligent computer buyer can choose between components to put together a better PC—deciding between an AMD or Intel processor, for example—you usually have little choice but to buy Windows with a new PC. Try it now. Phone your favorite big-name computer retailer. Say that you want a PC but you *don't* want Windows installed. Then listen as the salesperson on the other end of the phone struggles to understand.

Note Some PC manufacturers actually will sell you a PC without Windows installed on it. All you have to do is ask, although you might need to speak to a senior salesperson to get through to someone who understands your request. Smaller local companies, in particular, will be more than willing to sell you a PC without Windows. Some larger multinational companies, such as Hewlett-Packard, sell workstations with Linux preinstalled instead of Windows. However, these computers are usually aimed at businesses rather than home users.

Wouldn't it be terrific if you could get rid of Windows? Would you like to finally say goodbye to all those security holes and not have to worry about virus infections anymore, yet not lose out on any features or need to make sacrifices or compromises?

There is an alternative. Welcome to the world of Linux.

Linux is an operating system, which is to say that it's a bit like Windows. It's the core software that runs your computer and lets you do stuff on it. By the strictest definition of the term, an *operating system* is the fundamental software that's needed to make your PC work. Without an operating system installed on your PC, it would merely be an expensive doorstop. When you turned it on, it would beep in annoyance—its way of telling you that it can't do much without a whole set of programs to tell it what to do next.

An operating system allows your PC's hardware to communicate with the software you run on it. It's hundreds of programs, system libraries, drivers, and more, all tightly integrated into a whole. In addition, an operating system lets programs talk to other programs and, of course, communicate with you, the user. In other words, the operating system runs everything and allows everything to work.

Note Some companies and individuals, including Microsoft, define an operating system as much more than this fundamental software. They add in the basic tools you run on an operating system, such as web browsers and file management programs.

Linux consists of a central set of programs that run the PC on a low level, referred to as the *kernel*, and hundreds (if not thousands) of additional programs provided by other people and various companies. Technically speaking, the word “Linux” refers explicitly to

the core kernel program. However, most people generally refer to the entire bundle of programs that make up the operating system as “Linux.”

GNU/LINUX

Although most of us refer to Linux as a complete operating system, the title “Linux” hides a lot of confusing but rather important details. Technically speaking, the word “Linux” refers merely to the kernel file: the central set of programs that lie at the heart of the operating system. Everything else that comes with a typical version of Linux, such as programs to display graphics on the screen or let the user input data, is supplied by other people, organizations, or companies. The Linux operating system is the combination of many disparate projects. (We’ll explain how this works in the next chapter.)

The GNU organization, in particular, supplies a lot of vital programs and also system library files, without which Linux wouldn’t run. These programs and files were vital to the acceptance of Linux as an operating system in its early days. Because of this, and the fact that Linux completed a long-running goal of the GNU project to create a Unix-like operating system, some people choose to refer to Linux as GNU/Linux.

A fierce debate rages over the correct way to refer to the Linux operating system and whether the GNU prefix should be used. For what it’s worth, an equally fierce debate rages over how we should define an operating system. It can all get very confusing. It’s also very easy to accidentally offend someone by not using the correct terminology!

It’s not the purpose of this book to get involved in this debate. Suffice it to say that we acknowledge the vital input of the GNU project into the operating system many people refer to simply as Linux, as well as that of other vital projects. However, readers should note that when we refer to Linux throughout this book, we mean the entire operating system. If we intend to refer simply to the kernel programs, we will make that clear.

The Age of Linux

At the time of writing this book, Linux is a little over 15 years old. It has gone from a hobbyist project maintained by just one man to a professional and corporate-sponsored solution for virtually every level of computer user.

Linux has also gone from being a server operating system, designed for central computers that hand out files and other computer resources to other computers, to becoming a full-fledged graphical desktop operating system like Windows. In fact, it’s gone even further. Today, it’s very likely that you’ll find Linux running your digital video recorder and other computerized household gadgets.

Getting technical for a moment, Linux is a 32-bit and 64-bit, multitasking, multiuser operating system. This is a complicated way of saying that it’s pretty darn powerful. Linux is as capable of running supercomputers as it is of running a desktop PC. Linux builds on

the foundation laid by Unix, which itself was based on Multics, which was one of the first modern computer operating systems. It's not an exaggeration to say that Linux can trace its family tree all the way back to the pioneering days of computing.

CORRECT PRONUNCIATION

What most people refer to as the Linux operating system takes its name from the kernel program, one of its most important system components. This, in turn, was named after its creator, Linus Torvalds.

The name Linus is commonly pronounced “Lie-nus” in many English-speaking countries, but Torvalds speaks Swedish. He pronounces his name “Leen-us” (imagine this spoken with a gentle Scandinavian lilt, and you’ve got it about right).

Because of this, he pronounces Linux as “Lin-ux”, and most people copy this pronunciation. You can hear this spoken by Torvalds himself by visiting www.paul.sladen.org/pronunciation/.

Some people refer to the Linux operating system by its full title of GNU/Linux. In this case, GNU is pronounced as in the name of the animal, with a hard G: “G-noo.” The full pronunciation is therefore “G-noo Lin-ux.”

Finally, the DVD that comes with this book contains a version of Linux called Ubuntu. This is an African word that, in its country of origin, is pronounced in three separate short syllables: “oo-bu-ntoo.” However, most western English speakers pronounce the word “oo-bunt-oo,” which is perfectly acceptable!

The Problems with Windows

The world’s most popular operating system is Windows, which is made by the Microsoft Corporation. Linux has no links with Windows at all. Microsoft doesn’t contribute anything to Linux and, in fact, is rather hostile toward it, because it threatens Microsoft’s market dominance. This means that installing Linux can give you an entirely Microsoft-free PC. How enticing does *that* sound?

Windows is used on 91 percent of the world’s desktop computers. In other words, it must be doing a good job for it to be so popular, right?

Let’s face facts. On many levels, Windows is a great operating system, and since the release of Windows XP in particular, Microsoft has cleaned up its act. Windows XP does a much better job compared to previous versions of Windows (and Vista makes even more improvements). But the situation is far from perfect. Windows XP is notoriously insecure and virtually every day a new security hole is uncovered. The United States Computer Emergency Readiness Team (www.us-cert.gov) reported 812 security vulnerabilities for Microsoft Windows during 2005. That’s 15 vulnerabilities *per week*! In June 2005, the computer security company Sophos (www.sophos.com) advertised that its Windows anti-virus program defended against over 103,000 viruses!

This has led to an entire industry that creates antivirus programs, which are additional pieces of software you *have to install* once your computer is up and running for it to run without the risk of data loss or data theft.

Note Unlike many books, *Beginning Ubuntu Linux* doesn't ignore Windows. Throughout its pages, you'll find frequent references to Windows and the software that runs under it. You'll find direct comparisons with actual Windows programs, and you'll learn how to work with Windows files. The intention is that anyone with prior experience will be able to get started with Ubuntu much more quickly.

So is Linux the solution to these problems? Most would agree that it's a step in the right direction, at the very least. Most Linux users don't install antivirus programs, because there are virtually no Linux-specific viruses. As with all software, security holes are occasionally discovered in Linux, but the way it is built means exploiting those holes is much more difficult.

Note There have been a couple of viruses for Linux, but they're no longer "in the wild" (that is, they are no longer infecting PCs). This is because the security holes they exploited were quickly patched, causing the viruses to die out. This happened because the majority of Linux users update their systems regularly, so any security holes that viruses might exploit are patched promptly. Compare that to Windows, where most users aren't even aware they can update their systems, even when Microsoft gets around to issuing a patch (which has been known to take months).

There's also the fact that Linux encourages you to take control of your computer, as opposed to treating it like a magical box. As soon as you install Linux, you become a power user. Every aspect of your PC is under your control, unlike with Windows. This means fixing problems is a lot easier, and optimizing your system becomes part and parcel of the user experience.

Tip There's no reason why Linux and Windows can't live side-by-side on the same computer. This can be done by dual-booting, and we explain how in Chapter 5.

WINDOWS COMPATIBLE?

One of the biggest questions asked by most newcomers to Linux is whether it can run Windows software. The answer is yes . . . and no.

Linux is completely different from Windows on a fundamental technical level. Its creators based it on Unix, an industrial-strength operating system, and deliberately steered clear of emulating Windows. This means that Linux isn't a swap-in replacement for Windows. You cannot take the installation CD of a Windows program and use it to install that program on Linux, in the same way that you cannot install an Apple Mac program on Windows.

However, several current projects let you run Windows programs on Linux. Wine (www.winehq.com) is an example of such a project, and you can download a commercial and easy-to-use variation of it from www.codeweavers.com. You can also use programs like VMware (www.vmware.com) to create a "virtual PC" running on Linux. Then you can install the Windows operating system and, therefore, any Windows software you like.

In most cases, however, you'll find that there's a Linux equivalent of your favorite Windows software. Frequently, you'll find that this Linux version is actually superior to the Windows program you've been using. We'll discuss many of these in Chapter 11.

The Benefits of Linux

People have been known to exaggerate about Linux when singing its praises, and there's certainly some hyperbole around. But there are a couple of cast-iron facts about its benefits.

Fewer Crashes

The experiences of different people vary but, in our extensive experience, Linux very rarely crashes. The mouse cursor has never frozen on screen. A strange error box has never appeared and remained until we've rebooted. Program windows don't freeze and leave trails as we drag them around. It's possible to leave a Linux system running for years without ever needing to reboot (although most desktop Ubuntu users shut down their PCs when they won't be using them for a while, just like the rest of us).

Of course, programs that run on top of Linux sometimes crash, but they don't take the rest of the system down with them. Instead, you can clean up after a crash and just carry on.

Security

The next benefit is that Linux is very secure. It's built from the ground up to be secure, in fact, and Linux is based on years of proven computer science research. It works on the principle of users who have permissions to undertake various tasks on the system. If you

don't have the correct permission, you cannot, for example, access a particular piece of hardware. Additionally, privacy can be ensured, because the files on the PC are "owned" by individual users, who can permit or deny others access to those files.

Free and Shareable

Another big benefit is that Linux can be obtained free of charge. Once it's installed, the latest updates for all your programs are also free of charge. Not only that, but if you want any new software, it will also usually be free of charge (and normally just a download away). Is this starting to sound attractive yet?

The software is also released under a license that means you can share it with anybody you want. Suppose that you find a really great image editor. You mention it to a friend, and he asks for a copy. Under Windows, copying the program is strictly illegal—to do so turns you into a software pirate! Unless that image editor is freeware, your friend will need to buy the software himself. Under Linux, sharing software is normally entirely legal. In fact, it's encouraged! We'll explain why in Chapter 2.

This philosophy of sharing applies to the entire operating system. You can install the software contained on the DVD on the computer of your friends, relatives, or neighbors. You can even give them copies of the DVD. All this can be done entirely legally!

In fact, this redistribution is what the makers of Ubuntu want. They created Ubuntu so that it would be shared and used by anybody, anywhere in the world. They'll even send you or somebody you know free copies of the installation CD if you want; see the ShipIt page of the Ubuntu website: <https://shipit.ubuntu.com>.

No Annoying Copy Protection or Usage Restrictions

A happy side effect of the sharing culture that surrounds Linux is that you'll never need a software registration code to install it. There's no scheme like Windows Product Activation (WPA), or Windows Genuine Advantage, whereby the software must "phone home" over the Internet to be "activated."

This kind of approach to software, where the creators attempt to fundamentally limit what users can do with the software they've bought, is anathema to all those involved in Linux. Linux users are encouraged to play with the software in order to find or create more uses for programs, since Linux is about freedom, rather than restrictions.

The Linux Community

We've established that Linux is powerful, secure, and flexible. It doesn't nag you to register or ask you to type in lengthy registration codes.

But we've saved the best for last. Linux is more than a computer operating system. It's an entire community of users spread across the globe. When you start to use Linux, you become part of this community (whether you like it or not!).

One of the benefits of membership is that you're never far from finding a solution to a problem. The community likes to congregate online around forums and newsgroups, which you can join in order to find help.

Your placement in the ranks of the community is "newbie." This is a popular way of describing someone who is new to Linux. Although this sounds derisory, it will actually help when you talk to others. Advertising your newbie status will encourage people to take the time to help you. After all, they were newbies once upon a time!

There's another reason not to be disheartened by your newbie tag: you'll outgrow it very quickly. By the time you reach the end of this book, you'll have advanced to the other end of the spectrum—"guru." You'll be one of those giving out the advice to those poor, clueless newbies, and you'll be 100 percent confident in your skills.

Tip One of the best ways to learn about Linux is under the auspices of a knowledgeable friend. It's very beneficial to have your own guru to help you along when you get stuck—someone who is just an e-mail message or phone call away. If you have a friend who uses Linux, consider taking him or her out for a drink and getting more friendly!

But being part of a community is not just about getting free technical support. It's about sharing knowledge. Linux is as much about an ideal as it is about software. It was created to be shared among those who want to use it. There are no restrictions, apart from one: any changes you make and distribute must also be made available to others.

The spirit of sharing and collaboration has been there since day one. One of the first things Linus Torvalds did when he produced an early version of Linux was to ask for help from others. And he got it. Complete strangers e-mailed him and said they would contribute their time, skills, and effort to help his project. This has been the way Linux has been developed ever since. Thousands of people around the world contribute their own small pieces, rather than there being one overall company in charge. And the same concept applies to knowledge of Linux. When you learn something, don't be afraid to share this knowledge with others. "Giving something back" is a very important part of the way of the Linux community.

To understand why Linux is shared, you need to understand its history, as well as the history of what came before it. This is the topic of Chapter 2.

Summary

This chapter provided an introduction to Linux. It explained what Linux can be used for and also its many advantages when compared to Microsoft Windows. It also introduced the community surrounding Linux, which adds to its benefits. You should be starting to realize what makes millions of people around the world use Linux as the operating system of choice.

The next chapter covers the history of Linux. It also discusses another curious aspect: the political scene that drives the operating system forward.