Chapter 1

The Ubuntu Linux Project

Personal computers and their operating systems have come a long way since the late 1970s, when the first home computer hit the market. At that time, you could only toggle in a program by flipping switches on the front of the machine, and the machine could then run that program and only that program until you manually loaded another, at which time the first program was kicked off the system. Today's personal computers provide powerful graphics and a rich user interface that makes it easy to select and run a wide variety of software concurrently.

The first home computer users were a community of interested people who just wanted to do something with these early machines. They formed computer clubs and published newsletters to share their interests and knowledge — and often the software that they wrote for and used on their machines. Sensing opportunities and a growing market, thousands of computer companies sprang up to write and sell specific applications for the computer systems of the day. This software ranged from applications such as word processors, spreadsheets, and games to operating systems that made it easier to manage, load, and execute different programs.

Though the power and capabilities of today's personal computers is light-years beyond the capabilities of those early machines, the idea of writing software and freely sharing it with others never went away. Though it never got much press because nobody was making money from it, free software (and often its source code) has continued to be available from computer clubs, bulletin boards systems, and computer networks such as today's Internet. The free software movement finally blossomed with three seminal events:

- the creation of the GNU Project (`www.gnu.org`) by Richard Stallman in 1983, a project dedicated to developing software whose source code would always be freely available
- the announcement of the Free Software Foundation (FSF) (`www.fsf.org`), initially dedicated to fundraising for the GNU project

IN THIS CHAPTER

- the introduction of a free operating system project in 1991 that came to be known as Linux, by a Finnish computer software student named Linus Torvalds

The book that you hold in your hands wouldn't exist without these three events, the resulting shockwave of independence and empowerment, and the perpetuation of the community spirit throughout the computer industry that these events (and many related ones) caused. Sometimes, if you're lucky, the more things change, the more they stay the same.

The operating system and applications discussed in this book are free, and their source code is freely available. Anyone who wants to can build, install, and run them. A huge online community of users has sprung up around them, including specialized groups who create easily installed sets of this software, known as Linux distributions. This chapter explores the philosophy, community, and history behind one of the newest, and arguably the best, of these easily obtained, easily installed, and easy-to-use free software environments, known as the Ubuntu Linux distribution.

Background

The emergence of Linux, a freely available operating system, is a landmark event in modern personal computing. Today, Linux is arguably the most popular operating system in use for server environments, and is quickly gaining significant numbers of users as a personal computer operating system for home use. The following two sections provide some background on Linux if you're just considering adopting it or are unfamiliar with some standard Linux terms such as the idea of a Linux distribution. If you're already familiar with Linux and are interested in Ubuntu as your Linux distribution of choice, you can skip this section and go directly to "Introducing Ubuntu Linux."

Why Use Linux?

Presumably, you've bought this book because you want to use Linux, but if you're just reading to find out why you might want to do so, some common reasons for using Linux are the following:

- **Powerful, modern design:** Linux was designed from the ground up to enable you to run multiple programs at the same time and to provide services that your computer and others can use. Most other desktop computer operating systems, such as Microsoft Windows, started out as small operating systems that could run only one program at a time, and they have been trying to catch up ever since.
- **Freely available source code means no lock-in to a single vendor:** Regardless of the operating system that you're currently using, you may have encountered problems with applications or the way things worked. However, if you're using an off-the-shelf operating system from Microsoft or Apple, you can get fixes and updates only from Microsoft or Apple. Linux is open and free, so if you don't like the way that Red Hat's Linux works, how much it costs, or the type of customer support that's available, you can always switch to Novell's SUSE Linux, Mandriva Linux, or (preferably) to Ubuntu Linux.
- **Thousands of free, powerful applications:** Need a word processor? Download and install OpenOffice Writer, AbiWord, Kwrite, or dozens of others. Need a database? Download and install MySQL, PostgreSQL, or many others. Need to create graphics or manipulate digital photographs? It doesn't get much better than GIMP (GNU Image Manipulation Program). If anything, a problem with Linux can be that you have too many choices, none of which cost money.

- **Support for standards:** Linux and Linux applications are designed to support standards, because standards are the language of free intellectual commerce. Linux applications support modern application and data formats for audio, multimedia, document formatting, spreadsheet data, and many more. Because Linux is open and free, there can be no such thing as a proprietary Linux data or application format. This not only fosters data exchange between Linux applications, but also guarantees that you'll always be able to get to your data.
- **Lower total cost of ownership:** If you want to use Linux on your desktop or throughout your business, it's free to obtain and there are legions of Linux wizards available who can help you do whatever you want with it. There are no licensing fees — if you need to pay for something, you can pay for updates and support from the vendor of your Linux distribution.
- **Stable, powerful, and virus-free:** Linux is a mature, multiuser system that is dependable, stable, has built-in security and is immune to viruses except through system administration slipups.

It used to be the case that using Linux required some amount of special knowledge, but that's basically not the case any longer. Linux distributions such as Ubuntu make Linux easy — or, more properly, they make Linux invisible. As you'll see throughout the rest of this book, Ubuntu Linux provides an easy-to-use operating system and all of the applications that you need to do almost anything. The goal of this book is to explore Ubuntu Linux, explain how to have fun and get work done with it, and to provide any special details, insights, or knowledge that you might need. Shhh! Your grandmother doesn't have to know that she's running Linux.

What Is a Linux Distribution?

If you've been curious about Linux for a while, you've probably noticed that a bewildering number of different versions of it seem to be available. Computer magazines and Linux-related Web sites discuss Red Hat Linux, SUSE Linux, the Novell Linux Desktop, Fedora Core Linux, and many other things ending in Linux, each available from a different company or organization. Understanding exactly what people mean when they say "Linux" is the key to understanding how so many different versions of the same thing can be available, but that requires a little insight into how personal computers actually work from the software point of view.

When you install an operating system such as Linux, Microsoft Windows, or Apple's Mac OS X on your computer system, you're installing some amount of software that is invisible to any regular user because it runs behind the scenes. This software handles scheduling, starting, and stopping different programs, communicating with your computer's hardware, handling communications with peripherals such as your printer, and so on. This is generally known as system software because regular users don't directly interact with it, but it needs to be present and running to provide the services that application software relies on. The core piece of this system software is usually referred to as a *kernel* because it is the central piece of the operating system and everything else builds upon the fundamental services that it provides.

By itself, a kernel isn't very interesting — people don't actually want to run a kernel, they want to run applications. These applications depend on services that are provided both by the kernel and by other system software. For example, if you want to print a file, whatever application you're using needs to create a version of your file that is formatted in a way that your printer understands, and then schedule that file for printing. Another piece of software handles sending the formatted file to the printer, making sure that the file prints correctly, and so on.

In popular usage, "Linux" is the collective name for an operating system kernel and its associated applications. In reality, Linux is technically the name of just the kernel — most of the applications that anyone uses with Linux come from other free software projects. A *Linux distribution* is the correct term for a Linux kernel,

a set of applications that can run on top of it (regardless of where they come from), and a tool to install everything and configure your system. Each company or organization that provides a Linux distribution is taking advantage of the open source nature of the Linux kernel and the applications that run on top of it by putting together the "right" version of the Linux kernel with what they view as the "right" collection of core applications that anyone would want to run on top of it.

NOTE **Because many of the key applications that systems running the Linux kernel depend upon have their roots in the GNU project, the historically proper way of referring to a Linux distribution is as a GNU/Linux distribution. However, given the number of other projects that have made huge contributions to today's Linux distributions, this book simply refers to the term as Linux distributions, rather than as GNU/GNOME/KDE/TeX/*your-favorite-project-here*/ Linux distributions. This, in no way, minimizes the fundamental and huge contributions that the GNU projects and the FSF have made to modern computing. I'm an FSF member, and strongly suggest that you should be one, too. See `www.fsf.org/associate` for details. It's always a good idea to support the things that you believe in (and depend on).**

Of course, getting a CD or DVD that just contained a bunch of software would be next to useless without some easy way of installing it, configuring it so that it works with your particular computer system (identifying peripherals, setting it up to communicate over your network or with your ISP, creating user accounts, and so on). Therefore, anyone who puts together a Linux distribution also provides a tool for installing and configuring the system, which is generally what runs when you boot from a Linux CD or DVD for the first time. This installation and configuration tool generally leverages a package management system that makes it easy to add or remove sets of related applications, identifying dependencies between different software components to ensure that the applications that you install will actually execute correctly.

Linux distributions are the key to understanding how Linux can be free and sold at the same time. The source code for the Linux kernel and open source applications is indeed freely available from thousands of sites on the Internet. Anyone who wants it can get it, but putting it all together in an easily installable, usable form is another thing entirely. When people sell a Linux distribution, they are basically just charging you for the media that it comes on, the time and effort that they invested in putting it all together, and (in some cases) "charging in advance" for any customer support that you might need if you encounter installation or initial configuration problems.

Developing Linux distributions and making them widely available has been critical to the adoption of Linux as an operating system because these distributions have made it possible for people to actually install and use Linux, the GNU utilities, and so on.

Introducing Ubuntu Linux

Ubuntu Linux is a Linux distribution founded in 2004 and focused on the needs of end users. Ubuntu Linux is the product of the Ubuntu project sponsored by Canonical, Ltd. (www.canonical.com), a company founded by Mark Shuttleworth, a successful South African entrepreneur, long-time Debian Linux developer, and general open source advocate. Ubuntu is a Debian-based Linux distribution (more about that later in this chapter) that uses a graphical user interface known as GNOME as its desktop environment. (GNOME is discussed in detail in Chapter 5, "Using the GNOME Desktop.") Sister projects to Ubuntu include Kubuntu, a version of Ubuntu that uses the KDE desktop environment instead of GNOME, Xubuntu, a version of Ubuntu that uses the lighter-weight Xfce desktop, and Edubuntu, a version of Ubuntu that focuses on educational applications and popularizing the use of Linux in schools.

Everything has to have a name, but what is the Ubuntu in *Ubuntu Linux*? Not too surprisingly, the Ubuntu Linux Web site puts it best:

Ubuntu is an ancient African word, meaning "humanity to others." Ubuntu also means "I am what I am because of who we all are." The Ubuntu Linux distribution brings the spirit of Ubuntu to the software world.

Although that may be a bit touchy-feely for some, it's hard to argue with success and commitment. In 2005, its first year of availability, Ubuntu Linux received awards such as the *Linux Journal*'s Reader's Choice award, *Tux Magazine*'s Reader's Choice 2005 for Favorite Linux Distribution award, Ars Technica's Best Distribution award, the UK Linux & Open Source Industry's Best Distribution award, and the Linux World Expo's Best Debian Derivative Distribution award. Not too shabby for the new distribution on the block.

Aside from its technical excellence and usability (and some good funding thanks to Mark Shuttleworth), much of the success to date of Ubuntu Linux is due to the fact that its creators and proponents are not just the traditional Linux fanatics, but are genuinely committed to creating and promoting a usable and easily managed Linux distribution for end users all over the world.

The Ubuntu Manifesto

The Ubuntu Manifesto is a mission statement phrased in the classic manifesto form much beloved of artistic and political movements. The Ubuntu Manifesto is available online in the Philosophy section of the Ubuntu Web site (`www.ubuntulinux.org/ubuntu/philosophy`). Its core ideas are the following:

- Every computer user should have the freedom to run, copy, distribute, study, share, change, and improve their software for any purpose, without paying licensing fees.
- Every computer user should be able to use their software in the language of their choice.
- Every computer user should be given every opportunity to use software, even if they work under a disability.

The first bullet is largely a clear restatement of the goals of open source software in general, but the second and third bullets are two of the big drivers for the success of Ubuntu.

Internationalization is the term for producing software that is capable of displaying all prompts, dialogs, system messages, and so on, in any user's native language and any specific character set used with that language. The term internationalization is such a mouthful that it is frequently referred to as *i18n* because the word *internationalization* consists of the letter "i" followed by 18 letters and ends with an "n." The two aspects of i18n are *translation*, ensuring that versions of operating system and application messages and text are available in other languages, and *localization*, which ensure that messages and text can be displayed in a language's native character set(s). Amusingly, localization is often referred to as *l10n*.

Linux and its applications have been focused on i18n for years, thanks to initiatives such as the Linux Internationalization Initiative (`www.li18nux.net/`, known as *Li18nux*) and the Free Standards Group's Open Internationalization Initiative (`www.openi18n.org/`). These initiatives focus on ensuring that open source applications take i18n into account when developing, maintaining, and enhancing code. Many of the structural enhancements to the last few releases of desktop environments such as GNOME and KDE have been related to making sure that these environments and their applications support different languages and character sets.

The key to successful internationalization is two-fold — not only do applications and graphical environments need to support multiple languages and character sets, but the translations of prompts, dialogs, and system messages have to be available. Ubuntu's focus on a truly usable Linux distribution for an international audience has helped it become a hub for translation and localization work in Linux (`www.ubuntulinux.org/community/participate#l10n`) and GNOME (its primary graphical environment — more about that later) through an online translation system known as Rosetta (`https://launchpad.net/rosetta`), documentation translation efforts, active mailing lists, and other resources.

For additional information about Linux Internationalization, see additional Web resources such as the i18nGurus' Linux Internationalization Resources page at `www.i18ngurus.com/docs/984813514.html` **and the Linux Internationalization HOWTO, available online at sites such as** `http://home.no.net/david/i18n.php`**.**

Although many of the structural enhancements to the last few releases of desktop environments such as GNOME and KDE have been related to internationalization, a great deal of work has also been done to make Linux graphical environments easier to use by people with disabilities. Ensuring that graphical applications provide keyboard or gesture shortcuts for all menu commands and dialog interaction has been a growing focus area for GNOME, KDE, and graphical application development. Ubuntu's emphasis on usability is a boon to all computer users, regardless of whether or not they have a physical disability.

For additional information about Linux Accessibility projects and usability awareness, see additional Web resources such as the Linux Accessibility HOWTO (`www.tldp.org/HOWTO/Accessibility-HOWTO/`**), the Linux Developers Accessibility HOWTO (**`http://larswiki.atrc.utoronto.ca/wiki`**), and the Linux Accessibility Resource Site (**`http://larswiki.atrc.utoronto.ca/wiki`**).**

Ubuntu Linux Release Schedule

Given the pace of open source software development, it's important for anyone who depends on a Linux distribution to be able to get the latest and greatest kernels and versions of software packages. Kernel and associated device driver improvements provide security fixes, facilitate the use of the latest hardware, and often provide performance improvements in the handling of existing devices and protocols. The latest versions of software packages typically provide improvements in both capabilities and usability. Because the open source community model virtually guarantees that thousands of improvements are in progress at any given moment, delivering an integrated and tested version of the latest and greatest Linux kernel and supported software packages is a complex task, but is one that is extremely important to the success and widespread adoption of any Linux distribution.

The Ubuntu folks deliver a fresh Ubuntu release every six months. These regular releases provide an up-to-date and tested kernel and a well-tested, integrated set of user software including the X Window system release from x.org, the latest stable GNOME desktop, and core Linux and GNOME applications including Ubuntu-specific applications and customizations.

A regular release schedule is something that is unique in the Linux space, and has led to a unique approach to version numbering for Ubuntu releases. Traditional software releases are numbered according to major and minor release numbers, where the major release number is essentially arbitrary and generally indicates some major upgrade in functionality. For example, in traditional release numbering, version 4.2 is the minor release of version 4 of the software that follows version 4.1. Ubuntu uses major release numbers that identify the year in which the software was released, and what appear to be the minor numbers actually represent the month in which the release was made. Therefore, version 6.06 is the Ubuntu release from the sixth month of 2006. In typical, lighthearted Linux fashion, each Ubuntu release also has a nickname. Ubuntu releases at the time that this book was written were the following:

- 4.10: Warty Warthog (October, 2004)
- 5.04: Hoary Hedgehog (April, 2005)
- 5.10: Breezy Badger (October, 2005)
- 6.06: LTS (Long Term Support): Dapper Drake (June, 2006)
- 6.10: Edgy Eft (October, 2006)

This is a refreshing approach to version numbering, especially in the open source space where software is essentially under continuous development. Not only does it make it possible for users and system administrators to predict and schedule system updates to their systems, but it also makes it easy to identify the vintage of existing, installed systems without consulting a reference text or the Web.

Ubuntu Update and Maintenance Commitments

The frequency with which a distribution is released is important to any user in order to guarantee that they have access to the latest and greatest system and application software. However, for any business that is interested in the power, cost savings, and flexibility of Linux, the period of time in which a release will be updated and maintained is even more important. Many businesses have hundreds or thousands of computer systems. Businesses with substantial infrastructure on top of deployed systems need to spend significant time testing updates and new releases before they can even think about rolling them out to all of their computer systems. Once testing is complete, the physical act of updating deployed systems takes significant time, which literally translates into money in terms of MIS and IT personnel.

By default, security updates for each Ubuntu release are issued for 18 months after the release date — after that date, existing security updates are still available, but there is no guarantee that new updates for that release will be provided. To address the longer-term requirements of commercial Ubuntu users, Mark Shuttleworth and Canonical, Ltd., the founders and sponsors of Ubuntu Linux, formed and funded the Ubuntu Foundation in mid-2005. The Ubuntu Foundation employs some of the core Ubuntu community members to help guarantee the success and continuity of the Ubuntu development and release process. One aspect of the Ubuntu Foundation is an increased commitment to maintenance and updates. Ubuntu version 6.06 was the first Ubuntu Linux release to benefit from this when the Ubuntu Foundation announced that Ubuntu version 6.06 would be supported for three years on the desktop and five years on the server, doubling the standard 18-month support commitment that is a backbone of Ubuntu. The acronym LTS, for Long Term Support, was added to its release number to highlight that fact.

Given the pace of hardware and open source software development, Ubuntu's regular release schedule and long maintenance commitment helps ensure that Ubuntu users always have stable, secure, and up-to-date versions of the software that they depend on. It also provides a firm update and support commitment that is mandatory for the successful commercial adoption of Ubuntu.

Ubuntu and the Debian Project

Debian is one of the longest-lived Linux distributions available, and is the Linux distribution that is the conceptual parent of Ubuntu Linux. Debian is pronounced Deb'-ian, with a soft e, and is a contraction of the names of the founders of the Debian Project, Debra and Ian Murdock.

The Debian Project (`www.debian.org`) was founded in 1993 and has been delivering quality GNU/Linux distributions ever since. Debian is well known for stable releases based on a huge collection of thoroughly tested and completely integrated software packages. Unfortunately, the downside of balancing testing and integration with keeping up with the pace of open source development has led to a painfully slow release history — there have literally been years between official Debian releases. To be fair, three versions of the current Debian release are always available: stable (the released version), testing (the candidate for the next release), and unstable (the development version). However, many businesses (and users) are uncomfortable with depending on something labeled *testing* or *unstable*. Providing a faster release process, focusing on specific core technologies such as the GNOME desktop interface, and providing a better structured mechanism delivering software updates and notifying users of their availability are the key reasons why the Ubuntu project was born.

Some of the key ways in which the Debian and Ubuntu Linux distributions interact are the following:

- Ubuntu shares the software packaging format used by Debian, and also relies on the excellent and impressive technologies that were pioneered by Debian for identifying and resolving dependencies and relationships between different open source software packages.
- Ubuntu developers feed their changes and enhancements to open source packages back to the open source community, but also provide them directly to the Debian developers responsible for that package and even record patch information directly into the Debian bug-tracking system. Bug fixes and related enhancements made by Ubuntu developers are delivered as they are made during the Ubuntu release and testing process, not in a big bang fashion once an Ubuntu release is complete. This is better for everyone.
- The Debian and Ubuntu distributions are based on a slightly different selection of open source packages, but follow the same general organization of those packages into separate domains, as explained in Chapter 20, "Adding, Removing, and Updating Software."

The Debian and Ubuntu Linux distributions are closely linked, complementary distributions with different goals. Ubuntu would not exist without the pioneering efforts and contributions of the Debian distribution, but provides a more predictable distribution with better support channels for many users and enterprise computing environments.

Why Choose Ubuntu?

As mentioned earlier in this chapter, in any recent computer magazine, and if you've ever looked at the Linux section in your local bookstore, there are zillions of different Linux distributions. After all, it's free, so why not? Techies aside, most of the users of any Linux distribution are people who have heard that they should be using a specific Linux distribution, got a free Linux CD for some distribution in a Linux magazine that they bought, or happened to buy a book about a specific Linux distribution.

Ubuntu means "humanity to others," but the title bar on their Web pages says "Linux for People," and that's what Ubuntu is really about — a Linux distribution for people who want to get work done with a minimum of fuss and bother. Never mind that it's also a technically sophisticated Linux distribution with up-to-date software. Does it do what I want to do?

The answer is unquestionably "Yes!" However, if you're unconvinced or find yourself in a cocktail party Linux discussion, you may want more empirical data. Here are a few of the attributes of Ubuntu Linux that make it an attractive distribution to just about anyone:

- **Regular, up-to-date releases:** The Linux kernel and the thousands of software packages that comprise the Linux user and administrative environment are constantly being updated. As discussed earlier in this chapter, providing the latest and greatest kernel and application software on a regular schedule is a fundamental principle of Ubuntu Linux.
- **Commitment to quality:** The quality of a Linux distribution hinges on two things: how good it is in the first place, and the distributing vendor's degree of commitment to fixing problems that arise. In both cases, Ubuntu shines. Each release goes through extensive internal testing by the Ubuntu team and extensive public testing of release candidates. Once a release occurs, updates for that release are delivered for a minimum of eighteen months (as needed, of course).
- **Community and commercial support:** Much of the support for any Linux distribution comes from its user community, and it's hard to beat the passion and commitment of the Ubuntu community.

However, just as no business can afford to depend on an operating system without a reasonable maintenance commitment, no business can afford to depend on an operating system without some chance of guaranteed support. As discussed later in this chapter, a complete spectrum of commercial and community support is readily available for Ubuntu Linux.

- **Easy retrieval and application of updates:** The previous bullets have stressed the importance of being able to keep installed Linux systems up to date. Ubuntu provides great tools that notify users when updates are available and makes them easy to obtain and install. Ubuntu's graphical Update Manager and Synaptic Package Manager tools (discussed in Chapter 20, "Adding, Removing, and Updating Software") are the best examples of such tools that I have ever used.
- **Focus on usability:** Ubuntu defines itself as "Linux for People" and provides custom graphics, window decorations, and color schemes designed to provide an attractive, usable desktop environment for real people for personal use and to get work done. Like any other Linux distribution, you can customize this extensively, even switching to any of a variety of other window managers or desktop environments that are easily retrieved and installed through the Synaptic Package Manager. Ubuntu uses the GNOME desktop environment by default, which is well known for its support of and sensitivity toward accessibility requirements such as keyboard equivalents for menus and menu commands.
- **Focus on internationalization:** For some people, it comes as a surprise that there are people living on this planet who do not speak English, and that the languages that these people speak do not use the English alphabet and character set. I wish that I were kidding. Ubuntu is extremely focused on supporting translation efforts and providing a Linux distribution that people anywhere on the planet can use in their native language, with their native character sets.
- **Active and Involved Community:** As I'll discuss in the next section, it's hard to conceive of a more active, dynamic, and involved user community than that which surrounds Ubuntu. An active and involved community translates into more places to ask questions, a better chance of getting answers, and a more friendly experience when doing so.

As you can see from this list, Ubuntu focuses on solving many of the issues that plague other Linux distributions or which make it difficult for new users to adopt Linux as their operating system of choice. Most general-purpose Linux distributions would claim that they address the same sorts of issues, but in my experience, Ubuntu is exceptional in terms of delivering on them.

Installation Requirements

As Linux distributions have moved to the 2.6 kernel and Linux is becoming more and more popular, the chances of your having hardware that is not supported by Ubuntu Linux grow less and less. This section outlines the types of systems on which Ubuntu is supported, and the general hardware requirements for a usable system.

NOTE **One of the best things about Linux is the wide range of systems types on which it is supported. Most Linux distributions, including Ubuntu, will run on older systems that would probably otherwise be discarded or used as doorstops. However (and feel free to repeat this quote), software runs slower on slower hardware. When running on older systems, you will probably want to use the command-line interface or a lighter-weight graphical environment than the default GNOME (or KDE for Kubuntu) desktops. Desktops such as Xfce or window managers such as Fluxbox and IceWM are popular and powerful alternatives to GNOME and KDE. More about these in the section of Chapter 5 entitled "What's a Desktop? Graphical Environments for Linux."**

Supported System Types

Ubuntu is supported on any of the following types of systems:

- i386 or compatible processors from Intel, AMD, Cyrix, and so on
- G3 or better PowerPC (PPC) Apple Macintosh system
- 64-bit AMD or EM64T processors (which include the Athlon64, Opteron, and EM64T Xeon)
- Sun UltraSPARC systems

NOTE **At the time that this book was written, the Ubuntu 6.06 release for the UltraSPARC architecture was still an unofficial release, though both Canonical and Sun have announced that Ubuntu will be supported on UltraSPARC processors, highlighting the T1 ("Niagara") processors used on systems such as the Sun Fire T1000 and T2000 servers.**

Hardware Requirements

As with any computer software, you'll have a better experience if you install and use Ubuntu on the most powerful system that you have available, but Ubuntu will technically still run fine (though slowly) on your dusty 25 MHz i386. However, the American national slogan is eminently true here: "More is better." Taking off my Linux evangelist hat for a moment, you shouldn't really bother trying to install and run Ubuntu on a system with a processor that runs slower than 166 MHz or which has less than 96MB of memory. I use a system with exactly those characteristics for testing purposes (an old IBM ThinkPad 380XD that I just can't bear to part with), and GNOME is excruciating on that system. If you really need to run Ubuntu on such a system, see the note earlier in this section about alternate graphical environments for low-speed or low-memory systems.

The minimum hardware requirements for installing Ubuntu and having a reasonable user experience are the following:

- 700 MHz or better processor
- 256MB of memory
- CD-ROM drive
- Ethernet interface
- VGA graphics interface
- 3GB of available disk space

If your system satisfies or exceeds these, you're good to go. You can certainly install Ubuntu on slower systems or systems with less memory, but that's like putting racing slicks on a Hyundai — you're not really going to get the most out of the experience.

Time Requirements

The amount of time that it takes to install Ubuntu depends on the speed of your system, how you are configuring that system, and the type of distribution that you're installing. Installing Ubuntu on a laptop that already runs Microsoft Windows or Mac OS X and which you want to set up as a dual-boot machine may take an hour or so. Installing any version of Ubuntu on a new machine can take less than half an hour. In general, you should plan on spending an hour or two installing Ubuntu — I'm assuming that you're not going to complain if it takes less time than that.

Ubuntu CDs

The CD that is included with this book is the Ubuntu Desktop CD, which enables you to test-drive Ubuntu on an existing computer system without changing anything, and which also provides a simple, easy-to-use installer that enables you to install Ubuntu on that system permanently. Three different CDs for each fully supported platform are actually available from the Ubuntu folks. These CDs and the capabilities that they provide are the following:

- **Desktop CD:** The CD that is included with this book, this CD provides a bootable version of Ubuntu Linux that enables you to run and experiment with Ubuntu without changing anything on your existing computer system. This CD, known as a "Live CD," also includes an easy-to-use graphical installer that makes it easy for you to permanently install Ubuntu on your computer system. Finally, this CD includes versions of some popular open source software, such as Open Office, which you can install and use on a system running Microsoft Windows. For information about using this CD, see Chapter 2, "Installing Ubuntu."

NOTE **When running from the live CD, any work that you do, files that you create, and so on, will be lost when you reboot your computer system unless you save it to another system over the network or to removable storage such as a USB stick, removable hard drive, and so on. See the section of Chapter 2 entitled "Using Desktop CD Persistence" for information on using a USB stick or other removable media to automatically save and restore any changes that you make while running from the Ubuntu Desktop CD, or see the "Accessing Your Hard Drive from the Desktop CD" and "Copying Files to Other Machines Over a Network" sections of Chapter 2 for information about manually saving any work that you do while running from the Ubuntu Desktop CD.**

- **Server Install CD:** Enables you to install versions of Ubuntu Linux targeted towards machines that are being used as servers. You can choose to install a generic server and add the server software of your choice, or you can install a LAMP (Linux, Apache, MySQL, Perl) server where the traditional packages required for a Linux Web server will be preinstalled. None of the versions of Ubuntu installed from this CD include a graphical user interface, though you can always add one subsequently. For more information about obtaining this CD and installing from it, see the section of Chapter 3 entitled "Install Options on the Server Install CD."
- **Alternate Install CD:** Enables you to install Ubuntu on systems with certain hardware characteristics, or in specialized configurations. These include creating preconfigured systems for redistribution by Original Equipment Manufacturers (OEM), upgrading existing systems without network access, and setting up automated Ubuntu installations for multiple systems. Hardware-wise, the install options on this disk enable you to install Ubuntu on systems that use Logical Volume Management (LVM), use Redundant Arrays of Inexpensive Disks (RAID), where you want to install GRUB in a location other than the Master Boot Record (MBR), or on systems with limited amounts of memory (i.e., less than 192MB of RAM). For more information about obtaining this CD and installing from it, see the section of Chapter 3 entitled "Install Options on the Alternate Install CD."

The Desktop CD included with this book is the one that most people use to install Ubuntu. However, depending on the type of system that you want to create, you may want to download and burn a copy of another installation CD. The Ubuntu Web site provides freely downloadable ISO images of all of the available Ubuntu CDs, for all supported platforms, at `http://us.releases.ubuntu.com/releases`. (ISO images are files that contain an image of a CD in International Standards Organization CD format, which you can download and then burn to a CD yourself.) Pick the directory associated with the latest release, select the appropriate ISO image, download it, and burn a copy — or you can request that the folks at Ubuntu ship you a set of CDs. To do this, go to the page at `https://shipit.ubuntu.com`, create an account by entering your e-mail address and a password, and request Ubuntu CDs for the current release.

You can even order free CDs for multiple system types at the same time. The Ship-It site is cool for getting copies of Ubuntu to turn on your friends, but is not a good personal alternative if you're into instant gratification, because shipping and delivery can take a few weeks.

Support for Ubuntu Linux

By its nature, computer software occasionally requires that you ask questions about how to use it or ask for help with resolving specific problems. This is especially true of software such as Linux, where you are installing not only a zillion applications, but also the operating system that they depend upon. The primary advantage of off-the-shelf operating systems from a single commercial source, such as Microsoft Windows and Apple's Mac OS X, is that you can presumably contact the vendor if you're having problems installing, configuring, or using it. However, in reality, just try contacting Microsoft if you're having a problem using Windows. (Let me know how that goes.) In general, books like this one provide a central resource for installation, configuration, and general "how do I..." questions, but there are always specific questions that I can't anticipate. So how do you get your questions answered or find help when you need it?

Ubuntu offers an impressive array of support opportunities, ranging from community resources to paid support from Ubuntu's sponsor company, Canonical, Ltd., and a number of other companies located all over the world. The next few sections highlight the various ways in which you can ask questions, get answers, request paid support, and even hire experts to help with custom Ubuntu programming and support tasks.

Community Support and Information

Because Linux software depends on the community development model, getting timely, free help for problems often relies on a similar community approach. This is one of the areas in which Ubuntu truly shines, hosting mailing lists, blogs, and interactive forums that are all excellent sources of up-to-date information about Ubuntu. Forums and mailing lists enable you to post specific questions and receive responses from other Ubuntu users who have already solved the issue that you're experiencing. These online resources also serve as excellent feeder sites for the Ubuntu project, helping the project identify issues and common problems that should be addressed in future Ubuntu releases.

Blogs

Blogs (from the term "W*eb log*") are a popular buzzword, and it often seems as though almost anyone with a keyboard and any control over their Web site has one. The Ubuntu blog, known as Planet Ubuntu (`http://planet.ubuntulinux.org/`) is a bit different because it's not a continuous stream of consciousness from a single individual. Instead, Planet Ubuntu is a place where Ubuntu developers and community members can share various musings, insights, complaints, and successes.

If you're enough of a blog or Ubuntu fan to want to subscribe to it rather than simply visiting its Web page, Planet Ubuntu is also available in the following popular RDF (Resource Description Framework) and general markup formats:

- FOAF: Friend of a Friend, available at `http://planet.ubuntulinux.org/foafroll.xml`.
- OPML: Outline Processor Markup Language, available at `http://planet.ubuntulinux.org/opml.xml`.

- RSS: Really Simple Syndication or Rich Site Summary, depending who you ask. Planet Ubuntu feeds are available in RSS 1.0 (`http://planet.ubuntulinux.org/rss10.xml`) or RSS 2.0 (`http://planet.ubuntulinux.org/rss20.xml`) formats. You should use the appropriate format for your RSS reader.

Forums

Forums are the latest generation of what used to be known as bulletin board system, and are an attractive alternative to mailing lists if you have the time to visit the Web site that hosts them. Ubuntu's forums are hosted at `www.ubuntuforums.org/`. This site provides a huge selection of well-organized forums that you can easily search to find specific information, where you can post questions, or where you can simply chat with or see the posts of other Ubuntu users, dipping your toe into the waters of the Ubuntu community if you're not already an active member. You don't have to be a member of the forums to read them, but you do need to be a member to post there. Registration is free and easy — just go to `www.ubuntuforums.org/register.php`, and read and accept the Ubuntu Forum rules. You can then specify the user name that you want to use on the forums, enter a password, and provide your e-mail address and some minimal personal information.

The forums index page at `www.ubuntuforums.org/index.php` displays the categories into which the Ubuntu forums are organized, which are the following:

- **Beginner Community:** A forum section that hosts the Absolute Beginner Talk forum, which provides a forum where anyone can ask questions about computers, Linux, Unix, and Ubuntu. If you were ever afraid to ask a question because it might be too basic, this forum is for you!
- **Current Version Forum:** A set of forums dedicated to supporting users of the current Ubuntu and related project releases (6.06 LTS when this book was written). This forum area is divided into the following focus areas:
  - **General Support:** A set of forums for the current Ubuntu, Kubuntu, Edubuntu, or Xubuntu releases. These forums are divided into Desktop Support, 64-Bit Processor Support, Installation or Upgrade Help, and Macintosh/Apple/PPC Users, and Sun SPARC Users forums.
  - **Hardware Help:** A set of forums targeting problems with hardware not being detected or supported by Ubuntu Linux. This forum area hosts subforums on Networking, Video and Sound, Laptop Support, and Wireless Support topics.
- **Support & Resources:** A set of forums on a variety of general topics. This forum area is divided into the following focus areas:
  - **HOWTOs, Tips & Tricks:** A forum for discussing general, KDE, and GNOME customization, tips, and cool solutions.
  - **Gaming Central:** A forum for discussing playing games on Linux.
  - **Other Support Options:** A set of forums on specific areas of interest outside the normal support forums. This forum area hosts subforums on Accessibility, Repository Support, Server Talk, Programming Talk, Ubtunu Backports, the Ubuntu Users Mailing List, Security Issues, and Ubuntu Art.
  - **Third-Party Ubuntu Projects:** A set of forums on an ever-increasing collection of projects related to the Ubuntu community, but which are not sponsored by Canonical, Ubuntu, or other Ubuntu forums. At the time this book was written, these included forums on the Alacarte Menu Editor, an Ubuntu Women forum, Easy Ubuntu, the BUM Boot Up Manager, ubuntuguide.org, and an Ubuntu Podcast forum.

- **Previous Ubuntu Releases:** A forum section that hosts forums for discussing previous Ubuntu releases. Given Ubuntu's commitment to supporting and continuing to update all of its releases for a minimum of 18 months, the forums in this section can be very useful to users and businesses that are still running previous Ubuntu releases.
- **Development Discussion:** A forum section that hosts a development forum for the upcoming release of Ubuntu, and which also archives the development forums that were used to plan and discuss the current and previous Ubuntu releases.
- **Community Discussions:** A set of forums dedicated to general discussions and announcements. This forum area is divided into the following focus areas:
  - **Ubuntu Cafe:** A forum section that hosts general chat areas for Testimonials, The Fridge Discussions (see the discussion of the Fridge later in this chapter), a forum issue Resolution Center, a SPAM Jail, a Backyard forum for political and other debates, a forum for discussing Other Linux, and a Community Market area where people can advertise or request Ubuntu-related good and services.
  - **Forum Announcements:** A forum section that hosts forums for Official Ubuntu Announcements and one for Official Security Announcements.

Although other distributions have similar forum sites (such as Fedora Core's `www.fedoraforum.org` site), the Ubuntu forums embrace and reflect Ubuntu's commitment to users of the current Ubuntu release and previous Ubuntu releases that are still supported, which is truly unique.

In addition to the English-language forums discussed previously, Ubuntu forums are also available in many other languages, reflecting the commitment of Ubuntu and Ubuntu users to provide a truly international Linux distribution. These are not just translated, native character set versions of the English-language forums — in many cases, different native language sites hosts their own forums and organize those forums differently. You can find pointers to these forums on the page at `www.ubuntulinux.org/community/forums`. At the time this book was written, specialized Chinese, Dutch, Finnish, French, German, Italian, Polish, and Portuguese forum sites hosted forums in those languages, using any associated character sets. Ubuntu is truly an international effort!

IRC

Internet Relay Chat (IRC) is a popular mechanism for interactive online discussions of just about anything. The English-language Ubuntu IRC channel is named #ubuntu, available through the IRC site at irc.freenode.net. Non-English IRC channels are also available, including Chinese (#ubuntu-zh), Dutch (#ubuntu-nl), German (#ubuntu-de), Hebrew and Arabic (#ubuntu-il), Italian (#ubuntu-it), Portuguese (#ubuntu-pt), Russian (#ubuntu-ru), and Spanish (#ubuntu-es), at the time this book was written.

An IRC channel is a great, real-time mechanism for asking about current problems and getting help for resolving them online (assuming that your problem isn't related to getting online in the first place). The XChat IRC client is installed by default as a basic part of Ubuntu Linux, making it easy to connect and take advantage of IRC as a support and community resource.

Mailing Lists

Mailing lists are a great push format, meaning that questions and posts are delivered (pushed) directly to you, unlike forums, which are generally referred to as a pull format, because you have to connect to the Web site that hosts them and locate new posts and information yourself.

There are a huge number of Ubuntu mailing lists, many of which are quite specialized, and listing them all here would simply waste paper because you have to subscribe to them online in the first place. The standard Ubuntu mailing lists, as listed at `www.ubuntulinux.org/community/lists`, include the following:

- **Ubuntu Announcement list** (ubuntu-announce) has very few e-mails (less than one a month, usually) and will keep you up to date on new releases of Ubuntu, and significant new developments.
- **Ubuntu Development list** (ubuntu-devel) is intended for highly technical discussions and implementation details regarding current Ubuntu development.
- **Ubuntu Security Announcement list** (ubuntu-security-announce) is a read-only mailing list to which announcements of security updates to Ubuntu releases are posted. This list is extremely useful for Ubuntu system administrators or anyone who wants to make sure that they know about the latest security-related Ubuntu package updates.
- **Ubuntu User list** (ubuntu-users) is an extremely high-traffic mailing list for technical support discussions and to which Ubuntu users can post new feature requests and wish lists.
- **Ubuntu Women list** (ubuntu-women) is intended as a mailing list for all Ubuntu users, volunteers, developers, and others who wish to involve more women in the Ubuntu community.

There are many more lists, of course — these are just some of the highlights. You can find a complete, up-to-date list of available Ubuntu mailing lists at `http://lists.ubuntu.com`, which will take you to `http://lists.ubuntu.com/mailman/listinfo`. The Ubuntu mailing lists are managed using the popular MailMan mailing list management package.

TIP **For Usenet fans, the Ubuntu mailing lists are also available as Usenet news groups thanks to the folks at Gmane (`www.gmane.org`). The Ubuntu-related news groups available as news groups are listed at `http://news.gmane.org/index.php?prefix=gmane.linux.ubuntu`.**

What's on the Fridge?

Remember how your parents would post your latest accomplishments on their refrigerator? Hopefully, they've stopped now, but the Ubuntu Web site provides a software implementation of the same concept. The Fridge (`http://fridge.ubuntu.com`) provides a central location where Ubuntu users can find out what's truly new in the Ubuntu community. It features summaries of upcoming Ubuntu-related events, recent information about Ubuntu on the Web and in print media, status messages from various Ubuntu teams and projects, and newsletters such as the Ubuntu Desktop News and Ubuntu Documentation News.

Documentation

Traditional software products provide printed or online documentation to help anticipate and answer users' questions. However, as both a writer and long-time computer user, I've always appreciated and evangelized for good documentation. It doesn't matter how good software or an operating system is if you can't figure out how to use it. Linux documentation is an interesting issue because most Linux distributions are freely downloadable. There are few Linux distributions that you can actually buy off the shelf at a computer retailer, and even these provide relatively little printed documentation. Given the speed at which Linux distributions evolve and the tremendous variety of hardware on which Linux can be installed, complete printed documentation is difficult to produce in a timely fashion and is even harder to maintain. Novell's SUSE Linux is famous for the quality and bulk of the printed documentation that accompanies its boxed products.

Ubuntu has a large and well-organized documentation team that is focused on producing quality, user-oriented documentation that is just as easy to use as Ubuntu itself. Ubuntu documentation is available at two primary locations:

- `http://help.ubuntu.com`: the source for all of the official documentation that has been developed by the Ubuntu documentation team
- `https://wiki.ubuntu.com/UserDocumentation`: a hierarchical collection of resources in Wiki format that makes it easy to find documentation on specific topics

Some of the most useful Ubuntu documents that are available online are the following:

- `http://help.ubuntu.com/quicktour/C/quicktour.html`: a Quick Tour document for the current release of Ubuntu that provides a great overview of many of the significant features that it provides, as well as links to additional information
- `http://help.ubuntu.com/about-ubuntu/C/index.html`: the Ubuntu FAQ (Frequently Asked Questions) document, which provides a great starting point if you are having a specific problem or looking for answers to specific questions

The Ubuntu documentation team produces quality documentation that is well-organized and adheres to a single style guide to provide the sort of consistency that you'd expect from an organized documentation effort. The home page for the Ubuntu Documentation Project is at `http://doc.ubuntu.com/`, which provides pointers to both current documents and works in progress. All communications between documentation team members is done online, using IRC and mailing lists described at `https://wiki.ubuntu.com/DocteamCommunications`. If you're interested in contributing to the Ubuntu documentation effort, a list of current and planned projects is available at `https://wiki.ubuntu.com/DocteamProjects`.

Commercial Support for Ubuntu Linux

As discussed earlier, it's especially important for companies that are planning on adopting an enterprise-wide Linux solution to have a source from which they can get guaranteed support. Though you can typically find answers to most of your questions and solutions to most problems by simply searching the Web, most CEOs and IT managers won't accept "I'm googling it" as a suitable status message when an entire business is offline or some of their employees are unproductive because of a software or operating system problem. In business situations, it's important to have specific resources that you can depend on to solve problems in a timely fashion.

Though the majority of this chapter has stressed the scope and usability of the Ubuntu community and related resources in terms of helping you solve problems, commercial support is also available for Ubuntu from a variety of sources, as described in the next two sections.

Paid Support from Canonical, Ltd.

Canonical, Ltd. the sponsor of the Ubuntu Linux Project, offers two levels of paid support for Ubuntu Linux, known as Standard support and Premium support. These support packages and their current pricing are described at `www.ubuntu.com/support/supportoptions/paidsupport`. The basic differences between the Standard and Premium support packages is the following:

- Standard support is done online and guarantees a response within two business days, with a maximum of 10 support incidents per year.
- Premium support is done both online and by phone, guarantees a response within one business day, and entitles you to 25 support incidents per year. Phone response time is guaranteed to be within 4 hours.

The software packages that Canonical supports depends on the portion of the Ubuntu software repository in which those packages are located. As described in detail in Chapter 20, "Adding, Removing, and Updating Software," the software in the Ubuntu repository is grouped into several different classes, essentially depending upon the license(s) under which a software package has been released. Ubuntu support agreements include full support for packages in the *main* class, partial support for packages in the *restricted* class, and no support for software in the *universe* and *multiverse* classes. See Chapter 20 for details on the organization of the Ubuntu repository and the differences between package classes.

Canonical also offers special rates for certifying your in-house support organization or having Canonical's support organization function as an escalation site for problems that your support organization needs additional help with.

The Ubuntu Marketplace

The Ubuntu Marketplace is a portion of the Ubuntu Web site that lists the network of companies that provide support for desktop and server systems running Ubuntu Linux. The main page for the Ubuntu marketplace is `www.ubuntu.com/support/supportoptions/marketplace`, which provides centralized access to lists of companies all over the world that support Ubuntu, organized into separate pages listing such companies in Africa, Asia, Europe, Latin America, North America, and Oceania. (A related URL is the Community Market forum at `www.ubuntuforums.org`, which was mentioned earlier, though that is much more information than the actual Ubuntu Marketplace.)

Providing a centralized clearinghouse for companies that can help you or your firm with support problems is a tremendous advantage for companies that are just moving to Linux and would like to engage with a support organization that is geographically close to your physical location.

At the time this book was written, there were no specific certification requirements to have your company listed in the Ubuntu Marketplace — you simply send mail to `mailto:marketplace@ubuntu.com` containing the information described on the page at `www.ubuntu.com/support/supportoptions/marketplace/join`.

Getting More Information About Ubuntu

Ubuntu Linux is increasing in popularity faster than any Linux distribution that I have previously encountered. Technical excellence aside, much of the credit for its increasing popularity lies in the excellent organization and breadth of coverage provided on the main Ubuntu Web site. However, let's face it — the Ubuntu Web site is largely blowing its own horn. What do other people say? Are there locations other than the mother ship where you can go for information about and help with Ubuntu?

The answer to these questions is a definite "yes!" There are a huge number of sites that provide information about Ubuntu beyond simple software reviews. In addition to the support and general Web resources listed previously in this chapter, some of my favorite Ubuntu-related sites are the following:

- DistroWatch (`http://distrowatch.com/table.php?distribution=ubuntu`) provides summary information about the contents of most Linux distributions, including Ubuntu. Their Ubuntu page provides high-level information about the contents of the various Ubuntu releases, but more importantly provides links to many Ubuntu-related Web sites, reviews of the various Ubuntu releases, and much more. If you're not already familiar with DistroWatch, theirs is an essential Linux site for finding out just about anything about any Linux distribution.

- **Ubuntu Blog** (`http://ubuntu.wordpress.com/`) is a blog about Ubuntu that provides a great selection of entries about general Ubuntu tasks organized into categories such as administration, office, servers, and so on. It also features links to other sites and great task-specific articles such as the greatest of instructions for getting the MythTV package working on an Ubuntu system.
- **UbuntuGuide** (`http://ubuntuguide.org/`) hosts an Ubuntu "Getting Started" guide that is an excellent information resource, though it may not always reflect the latest Ubuntu release. The Ubuntu Starter Guide provides a great deal of very detailed information about how to do specific tasks on Ubuntu Linux, and is well worth a look.
- **Ubuntu Women** (`www.ubuntu-women.org/`) provides FAQs, a wiki, a blog, mentoring programs, and much more focused on getting more women involved in Ubuntu and FLOSS (Free/Libre/Open-Source Software) in general. This is a great site with a great message and purpose, through which we all win.
- **Ubuntux** (`www.ubuntux.org/`) is a community of Ubuntu users that provides a variety of forums, blogs, links to recent articles about Debian and Ubuntu, and a variety of other resources designed to help users work with Ubuntu. The forums are especially nice, covering the spectrum of topics from getting started with Ubuntu to specific customization and optimization topics. Ubuntux also features forums targeted toward Ubuntu-based distributions such as Kubuntu, Edubuntu, and Ubuntu Lite, as well as a forum on the Ubuntu server distribution. The Ubuntux site also offers an RSS feed to help you keep up to date with the latest Ubuntu-related happenings.

There are many other Ubuntu-related sites on the Web, with more appearing every day. The DistroWatch site provides a good collection of Links to Ubuntu-related sites and reviews, but as with anything on the Internet, your favorite search engine is your friend and will quickly help you find hundreds of other sites to search for answers to specific questions or simply to see what others think and say about Ubuntu.

Summary

Ubuntu is the fastest growing Linux distribution in recent memory, and is one of the finest examples of the power of open source and community that I've ever seen. After providing some general information about Linux, this chapter provided an overview of the philosophy behind Ubuntu Linux and the goals of the distribution. As discussed in this chapter, much of the success of Ubuntu to date beyond its technical excellence and ease of use is rooted in a rich, fast-growing user community and a well-organized Web site that provides easy access to various Ubuntu-related resources.