



Installing Ubuntu

It's now time to install Ubuntu. This is a surprisingly quick task and shouldn't take more than 30 minutes on a modern PC. It's also relatively simple, with very few decisions to make throughout. Ubuntu's installation program automates the task to a high degree.

However, you should examine all the options you're offered to make sure they're correct. Installing an operating system involves a couple of serious maneuvers that, via an incorrect click of the mouse or accidental keystroke, bring with them the possibility of data loss. Read and consider every warning message you see, and be sure to keep your wits about you. Above all, make a backup of your data, as described in the previous chapter.

An Overview of the Installation Process

The DVD-ROM disc supplied with this book is double-sided. This means it's like a vinyl LP record. To play Side A, simply insert the disc with the Side A label topmost. To play Side B, insert the disc with the Side B label topmost.

Side A contains the complete DVD-ROM release of Ubuntu 8.04, code-named Hardy Heron. This is the most recent version of Ubuntu at the time of writing and contains most of the officially supported software released by the Ubuntu project. Side B contains the following:

- An ISO image file of the CD release of Ubuntu 8.04, which you can burn to a blank CD-R/RW disc by following the instructions in Appendix D. This is included in case you wish to give copies of Ubuntu to your friends, or if you wish to try the Wubi Windows installer (see the “Install Ubuntu Inside Windows” sidebar), which isn't included with the DVD version of Ubuntu 8.04 for technical reasons.

Note You can also freely duplicate the DVD supplied with this book and give copies to friends if you wish. In fact, this is encouraged.

- The 8.04 (Hardy Heron) releases of Kubuntu, Xubuntu, and Edubuntu, which provide alternate desktop environments should Ubuntu's default desktop environment, GNOME, not suit your taste. For more details on these versions of Ubuntu, see Appendix D.
- A version of Ubuntu for PowerPC-based computer users, such as those with an older G3-, G4-, or G5-based Macintosh computer. You should bear in mind that this version of Ubuntu is community-supported. This means there isn't a 100% guarantee of updates or security fixes in the future, as with the officially supported releases. This is discussed in more detail in Appendix D.

If you want to use any of these installers on Side B of the DVD, you will first need to burn it onto a CD. This procedure is discussed in Appendix D.

However, most readers will want to install the full version of Ubuntu. So to start things rolling, insert Side A of the DVD-ROM drive and boot your computer. You might have to set your BIOS to boot from DVD, as explained in stage 2 of the installation guide in this chapter.

If you've ever installed Windows from scratch on a computer, you might be used to working with the Windows installation program. This appears when you boot from a Windows CD or DVD or run the `setup.exe` program from the desktop, and it guides you through installing Windows onto your hard disk.

Ubuntu is a little different. Once you've booted from the DVD-ROM, a menu will appear. You can choose the Install Ubuntu option, and the DVD will continue booting to a graphical installer. Alternatively, you can choose the Try Ubuntu Without Any Change to Your Computer option. This allows you to run Ubuntu from the DVD-ROM, effectively trying it out without making any changes to your computer.

Using Ubuntu without installing it to the hard disk is known as running in *live distro mode*. Although this is a great way to take a sneak peak at what Ubuntu offers, there are a handful of practical drawbacks, as discussed in the sidebar titled "Running in Live Distro Mode."

To install Ubuntu on your computer, simply select the Install Ubuntu option from the boot menu. This will run the dedicated installation program, which will work through a few stages to get Linux on your computer's hard disk. During the installation stages, you'll be asked a handful of essential questions. You'll then be prompted to repartition your hard disk in order to create space for Ubuntu. After this, Ubuntu is installed onto your hard disk.

At the end of the procedure, your PC will boot straight into the Ubuntu login screen, and you're set to go. There's no need to mess around configuring hardware, because that's done automatically. Neat, eh?

In most cases, the installation process will run smoothly without a hitch. But if you do run into problems, head over to Chapter 6, which addresses many of the most common issues and provides solutions.

RUNNING IN LIVE DISTRO MODE

If you don't want to install Ubuntu just yet, you can try it out by booting the operating system straight from the DVD supplied with this book. To do this, simply insert the DVD-ROM, and then reboot your computer. Make sure the computer is set to boot from DVD (see stage 2 of the installation guide in this chapter to learn how), and select the Try Ubuntu Without Any Change to Your Computer option. After a few moments, the Ubuntu desktop will appear. You can follow most of the chapters in this book when running in live distro mode. However, there are a number of issues you should be aware of:

- **Settings:** Any changes you make to the system will be forgotten as soon as you shut down your PC or reboot. In other words, each time you run in live distro mode, it will be as if Ubuntu has been freshly installed. For example, if you've configured a network card or rearranged the desktop, those changes will be lost. There are ways around losing settings on each reboot, but they involve partitioning your hard disk, which, frankly, is as much effort as installing Ubuntu from scratch. So there's little to be gained by doing so.
- **Performance:** Because the data must be read from DVD-ROM, running Ubuntu in live distro mode is a slow and, therefore, frustrating experience. It can also be noisy if your DVD-ROM is a model that makes a whirring noise as it spins.
- **System:** As strange as it sounds, Ubuntu is largely unaware of when it's running in live distro mode. For example, if you were to follow the instructions in Chapter 9, which discuss how to update your system, Ubuntu will attempt to update, even though it's running in live distro mode! Of course, it can't do this, because, as far as it is concerned, the DVD-ROM is the hard disk, and it's therefore impossible to write data to it. This can create confusing error messages.
- **Root:** When running in live distro mode, you're automatically given root-user powers. We explain the significance of this in Chapter 7, but for the moment, it's enough to know that the root user has unlimited power over the system. This means that you could repartition the hard disk, for example, or even wipe the hard disk entirely, all without any password prompt or warning. This can be useful in certain circumstances—you can attempt to "rescue" a hard disk that's having problems using the live distro mode of the Ubuntu disc. But using it for everyday tasks is a huge risk, and the potential for accidental damage is high.

In short, we would recommend that you use live distro mode sparingly and only to get a taste of what Ubuntu is like. If you intend to use Ubuntu for any significant period of time, you should install it to your hard disk.

Step-by-Step Guide

As outlined in Chapter 4, you shouldn't start the installation process until you've made sure there is enough space for Ubuntu on your hard disk and you have backed up all the data. With those preparations complete, you're ready to install Ubuntu. The remainder of this chapter guides you through the process.

Stage 1: Prepare the Windows Partition for Resizing

If you're installing Ubuntu on a computer that already contains Windows, it's a good idea to perform three additional steps before actually installing Ubuntu. These steps will ensure Ubuntu will be able to resize the Windows partition successfully.

If your computer doesn't contain Windows, or if you're installing Ubuntu onto a second hard disk, then you can skip straight to stage 2.

The following are the steps for preparing the Windows partition for resizing:

1. Scan the disk for errors.
2. Defragment the hard disk.
3. Ensure Windows is shut down correctly.

To scan the disk, open My Computer (or Computer if you're running Windows Vista), right-click your Windows drive (usually C:\), and select Properties. In the window that appears, click the Tools tab, and then click the Check Now button under the Error Checking heading. Ensure there's a check alongside Automatically Fix File System Errors, as shown in Figure 5-1, and click the Start button. You will then be prompted to schedule the disk check the next time your computer restarts. Select to do so, and reboot your computer, so the disk check can take place.

When the computer has rebooted, repeat the previous steps to view the Tools tab of the drive's Properties dialog box, and click the Defragment Now button. Then work through the defragmentation program's options in order to defragment the Windows disk (usually this involves simply clicking the Defragment button (labeled Defragment Now under Windows Vista).

Once that has completed—it may take several hours if your computer has not been defragmented before—shut down the computer as usual, and proceed to stage 2 of the installation process.

It's vital that the computer shuts itself down properly. If the computer doesn't cleanly shut down, Ubuntu's installation program might stop with an error message about not being able to resize the partition.

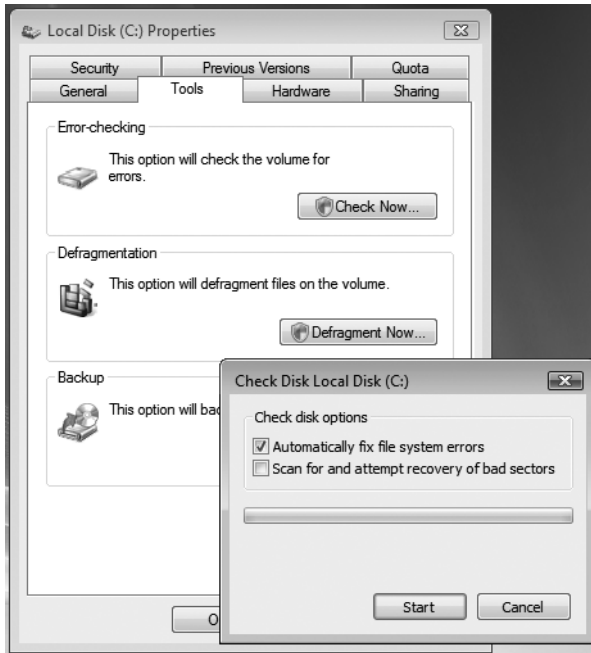


Figure 5-1. Before installing Ubuntu, it's essential to scan the Windows partition for errors and to defragment it.

INSTALLING UBUNTU INSIDE WINDOWS

Version 8.04 of Ubuntu includes a clever piece of software called Wubi that lets you install Ubuntu within the Windows file system. In other words, there is no need to repartition your hard disk. Aside from this, there is no major difference between a partitioned installation and a Wubi installation.

Wubi works by creating a loopback file system; that is, it creates a single large file within the Windows file system, and that file is then used as the Ubuntu file system.

Wubi is a nice way to try out Ubuntu on a more permanent basis than using the live distro mode. The biggest issue is that Wubi requires at least 256MB of memory and 5GB of hard disk space, although this shouldn't present any problems for relatively modern computers. However, users have reported performance degradation compared to a dedicated Ubuntu installation in its own partition, and you'll also find that Ubuntu's useful Hibernate power-saving mode (what Windows refers to as Suspend to Disk) isn't supported.

Unfortunately, Wubi isn't included on the DVD release of Ubuntu, as supplied on Side A of the DVD-ROM disc that comes with this book. To use it, you'll need to burn your own CD-R/RW disc from the installation ISO image of Ubuntu provided on Side B of the disc. To learn how to do this, follow the instructions in Appendix D.

To use Wubi, insert the CD while Windows is up and running. In the dialog box that appears, click the Install Inside Windows button. If the dialog box doesn't appear, navigate to the contents of the CD and double-click `wubi.exe`. In the next dialog box, you are presented with a series of drop-down lists. Using these, you can choose on which drive to create the Ubuntu file system, if you have more than one hard disk or partition, and you can choose the size of the loopback file system you want to create. In most cases, the default options are fine. You will need to enter a username and password in the boxes provided. These will form your Ubuntu login details. When you're finished, click the Next button.

Wubi will then create the loopback file system. When it has finished, you'll be invited to reboot your computer. After the computer is up and running again, you'll be presented with a boot menu from which you can choose either Windows or Ubuntu. Choosing Ubuntu will then start the installation routine, which will complete automatically. Following this, you'll be prompted to reboot. From then on, selecting the Ubuntu option from the boot menu will start Ubuntu. To start Windows, simply choose the Windows option from the menu.

To remove the Ubuntu file system from your Windows hard disk, navigate to `C:\ubuntu` from within Windows and double-click `Uninstall-Ubuntu.exe`. Don't be tempted to just delete the `ubuntu` folder, because doing so will not remove the boot menu component.

Stage 2: Boot from the DVD-ROM

With your computer booted up, insert the Ubuntu disc into the DVD-ROM drive, with Side A topmost. Close the tray, and reboot your computer. The disc might automatically run under Windows, opening a menu where you can click to find out more about Ubuntu, but you can ignore this.

Because you need to boot from the DVD-ROM disc in order to run the Ubuntu installer, the first step is to make sure your computer's BIOS is set correctly.

Many modern computers let you press a particular key during the initial boot phase of your computer, during the memory testing and drive identification period, to make a boot menu appear. On the boot menu, you can choose to boot from the CD or DVD drive from the list. On our test PC and notebook computer, hitting the Esc key causes this menu to appear, but your computer may be different. Your computer's boot screen should indicate which key to press.

If you do not have an option to boot from the CD/DVD drive, you'll need to enter the BIOS setup program and change the boot priority of your computer. To do this, press the Delete key just after the computer is first activated. Again, some computers use another key or key combination, and your boot screen should indicate which key to press.

When the BIOS menu appears, look for a menu option such as Boot and select it (you can usually navigate around the screen of the BIOS menu using the cursor keys and select options by pressing Enter). On the new menu, look for a separate entry such as Boot Device Priority or perhaps Boot Sequence. Make sure that the entry for the CD/DVD-ROM is at the top of the list, as shown in the example in Figure 5-2. Arrange the list so that CD/DVD-ROM is followed by the floppy drive and then your main hard disk. You can usually press the F1 key for help on how the menu selection system works.

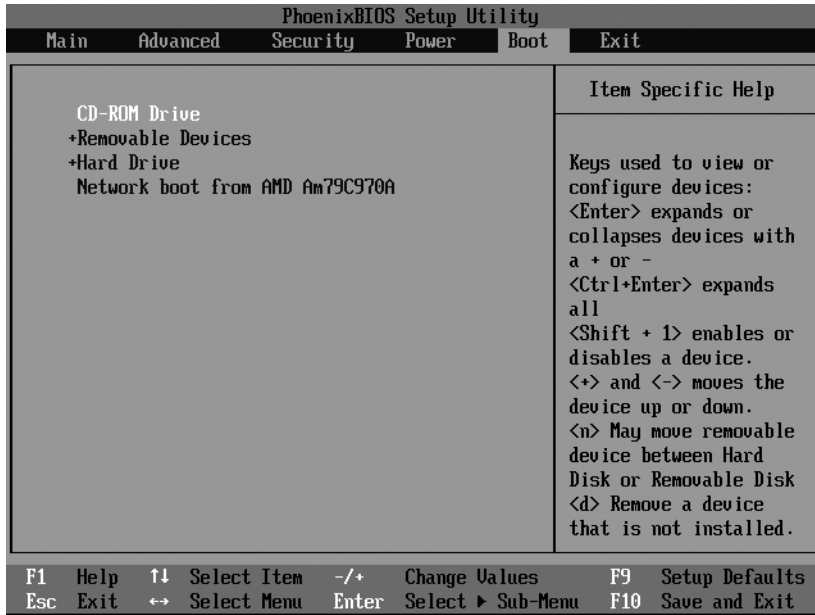


Figure 5-2. Before starting, make sure your computer can boot from the DVD-ROM.

Once you've made the changes, be sure to select the Save and Exit option. Your PC will then reset and boot from the Ubuntu DVD-ROM, and you'll be greeted by the Ubuntu DVD boot menu.

Note After Ubuntu has been installed on your computer, you might choose to repeat this step and rearrange the boot order once more to make the hard disk appear at the top of the list. Then your computer won't waste time checking the DVD-ROM drive for a boot disc every time it starts.

Stage 3: Choose Language Settings

Once the Ubuntu disc has booted, but prior to the Ubuntu boot menu appearing, you'll be prompted to choose the language in which you want the boot menu to appear. Use the cursor keys to make your choice, as shown in Figure 5-3, and then press Enter.

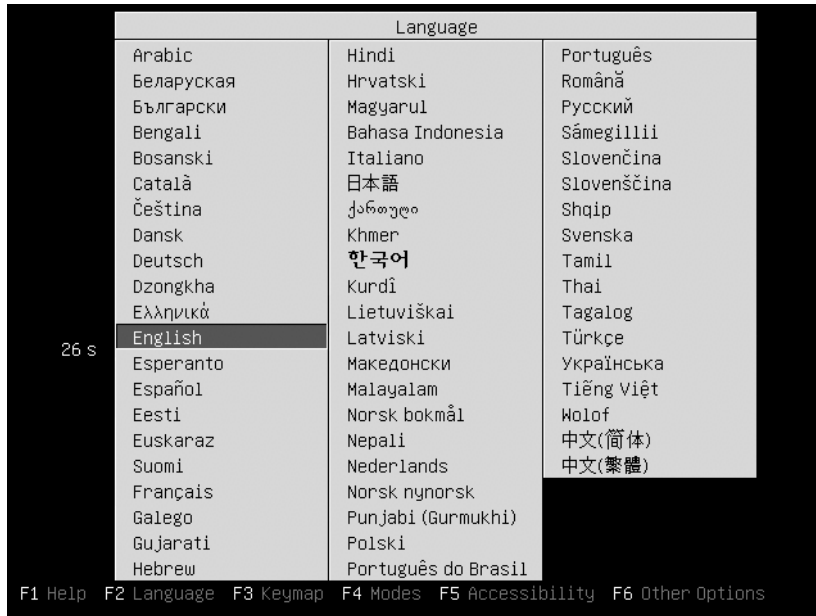


Figure 5-3. Choose the language you wish to use for the boot menu and hit Enter to select it.

Stage 4: Select from the Boot Menu

When the DVD-ROM boot menu appears, you'll be offered a number of options, as shown in Figure 5-4. You can move between the menu options using the up and down arrow keys. Hit the Enter key to select an option.

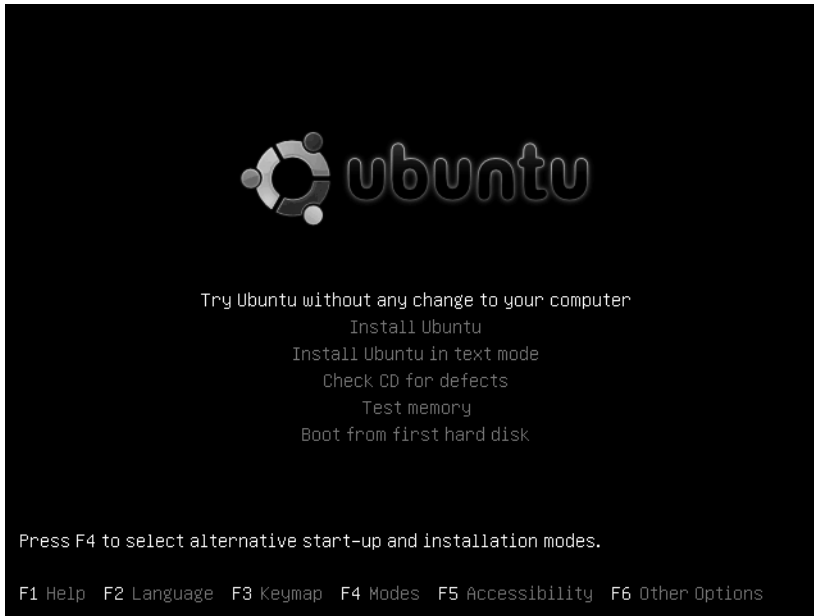


Figure 5-4. *Select Install Ubuntu and press Enter.*

The options are as follows:

Try Ubuntu without any change to your computer: This option lets you run Ubuntu from the DVD-ROM disc, so you can try out its features, albeit in a slightly limited state (see the “Running in Live Distro Mode” sidebar).

Install Ubuntu: This will start Ubuntu’s installation routine and is the option you should choose.

Install Ubuntu in text mode: This will start an older installation routine that runs solely in text mode, without any graphics. This can be useful if your computer has problems running the graphical installer that appears when you select the Install Ubuntu option.

Check CD for defects: This will check the DVD, even though it says “Check CD,” and make sure that the DVD contents are correct. A defective or damaged DVD will cause errors at some point during the installation process. Once the DVD has been validated, you can press any key to reboot. Note that you don’t need to use this option unless you run into problems during installation and are trying to locate the cause.

Test memory: This will start a simple but thorough memory-testing program called Memtest86. This is useful if you think your computer's memory might have a fault that will prevent you from installing Ubuntu. For more details about how to use Memtest86, see www.memtest86.com. To quit Memtest86 and reboot your computer, press Esc.

Boot from first hard disk: This will cause the computer to boot from the default hard disk, thereby bypassing Ubuntu. If your computer has Windows installed on it, this will start Windows.

Stage 5: Choose a Language for Ubuntu

After some time, the Ubuntu installation program will start, as shown in Figure 5-5. From the list on the left, choose the language you wish to use when Ubuntu is up and running on your computer (not just during the installation), and then click the Forward button.

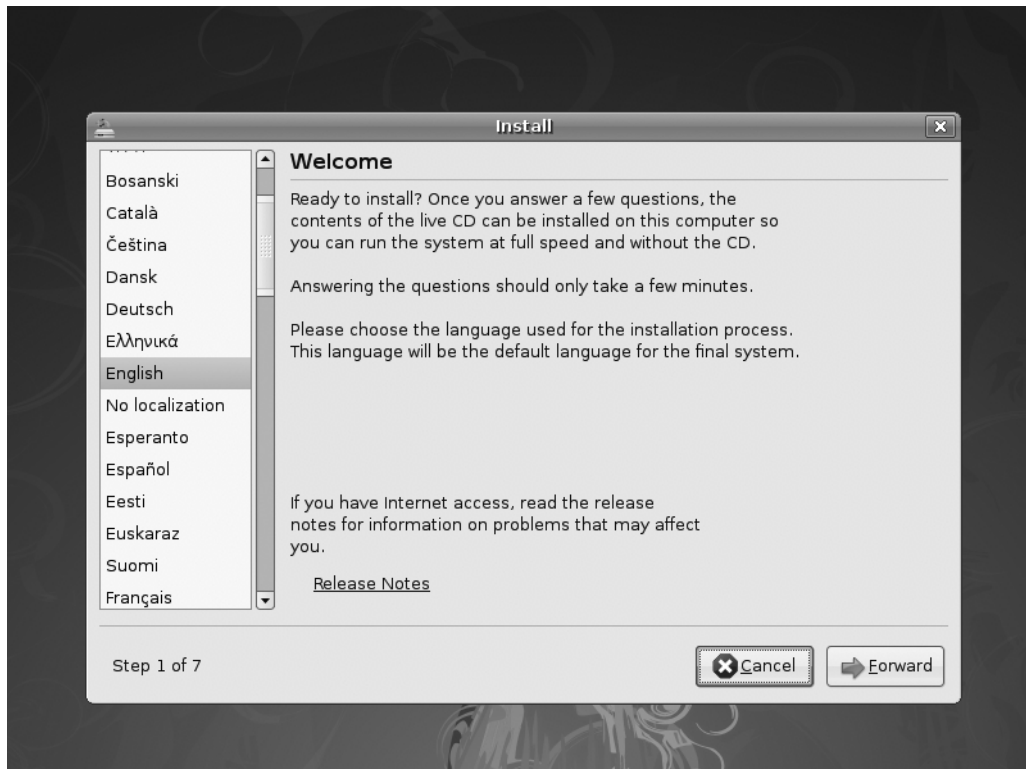


Figure 5-5. Select the language you want to be the default when Ubuntu is installed, and then click the Forward button.

Stage 6: Select Your Country and Time Zone

Ubuntu will next ask you to choose your time zone. Choices include American time zones, such as Eastern Standard Time (EST), and European time zones, such as Greenwich Mean Time (GMT). The selection can be made either by clicking your location on the world map that's displayed or by selecting the nearest city from the Selected City drop-down list.

When you click the map, you should find that it zooms in; clicking anywhere within the mainland United States, for example, should enlarge the continent, allowing for more accurate selection. See Figure 5-6 for an example.



Figure 5-6. When you click the time zone map, you should find it zooms in and allows for easier selection of the city nearest to your location.

Regardless of where you live, you should see dots on the map representing major cities in your locality. Click the one closest to you that's in the same time zone. In some cases, the choice is limited—those in the UK can click only London, for example.

Note Actually, if you look closely at the time zone selection screen, you'll see that, in addition to London, you can also click the Isle of Man, a small island off the northwest coast of England. Why is such attention paid to this location? Well, it so happens that this is where the registered offices of Canonical, the company behind Ubuntu, are located!

The city you choose doesn't matter a great deal—the purpose of this step is to ensure Ubuntu selects the correct time zone for your location, which it does by looking up the city in a database of time zones.

When you've made your selection, click the Forward button.

Stage 7: Confirm Your Keyboard Layout

Next, you'll be asked to confirm the keyboard layout you'll be using, as shown in Figure 5-7. This should correspond to your language and locale settings, and will be automatically selected, so you can just click the Forward button. If you're unsure whether Ubuntu has guessed the correct keyboard layout, you can click the test text field and type in some characters before continuing.

Note Keyboard layouts can differ from country to country even if they speak the same language. This is to allow for local necessities. The UK keyboard layout has the pound sterling symbol (£) above the number 3, for example, and swaps around the locations of a handful of other symbols, too.



Figure 5-7. *Ubuntu will guess your keyboard layout, but you can test it to make sure by typing in the test text field at the bottom of the dialog box.*

Stage 8: Repartition Your Hard Disk

Partitioning the disk is one of the most important steps during installation, although, unfortunately, it's one that can be couched in difficult terminology. Ubuntu does its best to make partitioning easy.

The Ubuntu installation routine offers four options for disk partitioning:

- Resize the existing partition on the hard disk and install Ubuntu alongside it in the newly created free space.
- Use the entire disk, whether it already has some contents or not (that is, if the computer or hard disk is new or if you want to overwrite your Windows installation).

- Use the largest free space that might already exist on the hard disk (perhaps if you’ve already manually repartitioned the disk).
- Manually edit the partition table; that is, resize/delete any existing partitions by hand and create the Ubuntu partitions.

Most people who are installing Ubuntu on a computer that already has Windows on it will want to resize the main partition, as described next.

If you’re installing Ubuntu on a computer that has no operating system installed or one that you would like to completely erase from the computer, follow the instructions under “Use Entire Disk.”

Resize the Main Partition

This is the default partitioning option if your computer already has Windows installed on it. Ubuntu will detect the main Windows partition and suggest the amount of resizing.

Caution If there’s not enough free space within the Windows partition, you won’t be able to resize it to make space for Ubuntu. If this is the case, the Ubuntu installer will tell you. See Chapter 4 for suggestions for freeing up space.

By default, Ubuntu attempts to grab as much space for itself as possible, without shrinking the existing partition too much. In our example in Figure 5-8, the installation program has decided that 71% of the entire disk space should be devoted to Ubuntu, shrinking the Windows partition so that it takes up 28% of the space. This is shown in the bar display: the left part of the bar represents Windows, and the right part represents the new Ubuntu partition.

Ubuntu’s default choice is normally fine, but you can also click and drag the grab bar in the middle of the partitioning display bar to increase or decrease the sizes of the Windows and Ubuntu partitions. You may want to give Windows a little more space if you plan to divide your time between Windows and Ubuntu.

The Ubuntu installer is intelligent enough not to let you set an impossible value for shrinking the existing partition. The Ubuntu installer is also clever enough to know that Windows needs some free space within its partition to operate effectively—to write temporary and system files and user-created files such as Word documents, for example. So you shouldn’t be able to make changes that are too extreme. On a test system, we couldn’t set a size for the existing partition lower than 10% of the entire disk, because the existing data on the partition occupied around 10% of the space. You can override this protection by manually partitioning, as described under “Manually Edit the Partitioning Table.” Similarly, the installer shouldn’t let you create an inadequate amount of free space for Ubuntu when dragging the slider to the right.

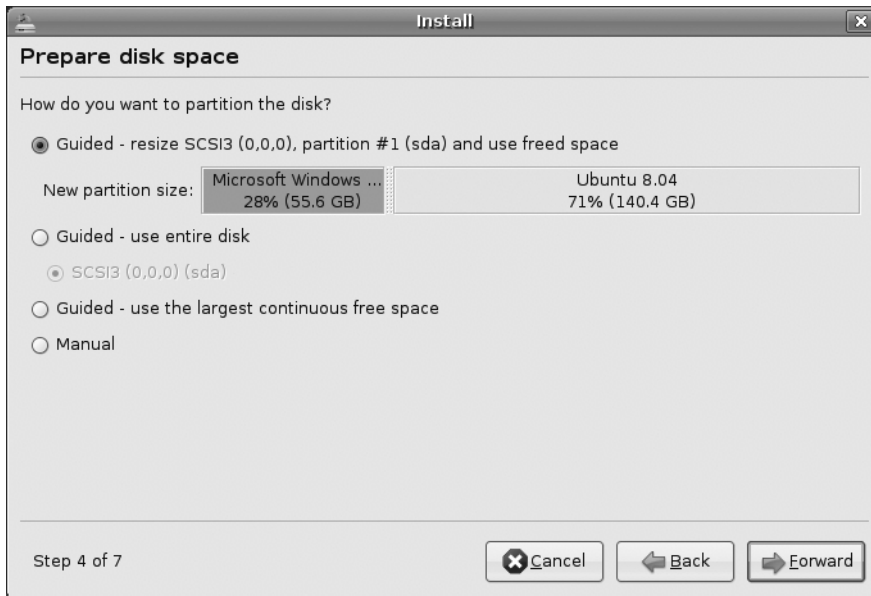


Figure 5-8. *The installer will take as much space as Ubuntu needs, without shrinking the existing partition too much.*

Once you’ve made your selection, click the Forward button. The installer will resize the partition, which might take a few moments.

Caution If you’re resizing a partition on a notebook computer, ensure that you have the main power connected. If the power goes off during the resizing procedure because of a failing battery, there’s a very good chance your Windows partition will be destroyed.

Use Entire Disk

If the hard disk is empty, or if you’ve decided to eradicate Windows and use only Ubuntu on your computer, you can choose the Guided – Use Entire Disk option.

If the disk does have contents, this option will remove them and then use the entire disk to install Ubuntu. As mentioned in Chapter 4, before undertaking this move, you should back up essential data on the Windows partition (or any others on the hard disk). There is no way of undoing the partition erasure, so you should proceed with caution.

Once you’ve made the choice, click the Forward button. The deletion should take place quickly, after which you can proceed straight to the next stage in this guide.

Use the Largest Contiguous Free Space

If you've already repartitioned your hard disk using a third-party utility, or if you deliberately created a smaller Windows partition in order to leave free space for another operating system, you can select the Guided – Use the Largest Continuous Free Space option (note that this option won't appear unless there is free space on the hard disk). Then the Ubuntu installation program will use the *largest amount of free space* for the Ubuntu partitions. This is an important point: if you have more than one area of free space, the largest will be used.

If you do have more than one amount of free space, the Ubuntu installation routine is unable to automatically use any smaller amounts of free space. If you wish this to be the case, the only option is to manually partition, as described under “Manually Edit the Partitioning Table.” However, only advanced users will need to do this.

When you've made your choice, click the Forward button, and proceed to the next stage in this guide.

Use a Second Hard Disk

If your computer has more than one hard disk—a new hard disk you've added for Ubuntu, as described in Chapter 4, or a second hard disk already installed in your computer—you should select it under the Guided – Use Entire Disk option, as shown in Figure 5-9. The way Ubuntu identifies your hard disks might seem a little complicated at first, but is actually straightforward.

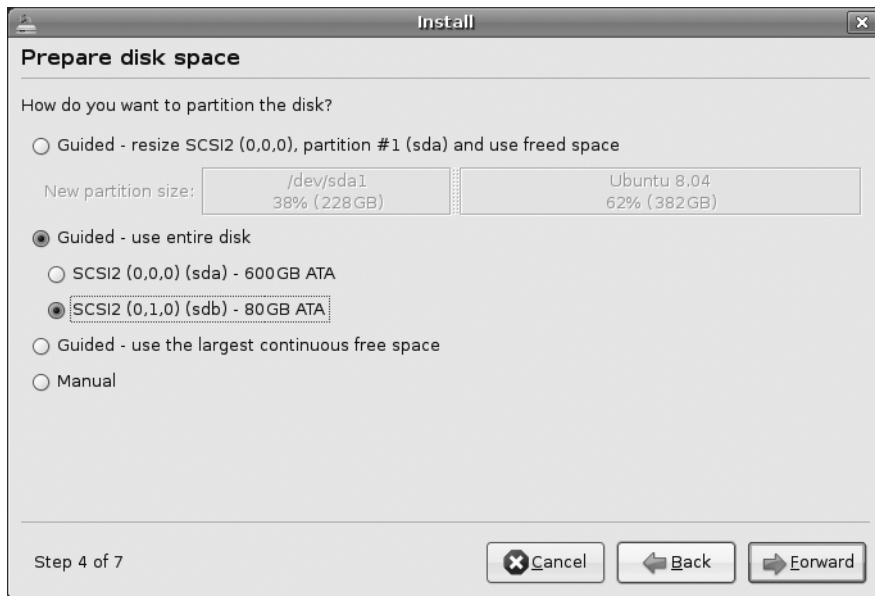


Figure 5-9. If there's more than one hard disk installed, and you want to install Ubuntu to use the second one, select it under Guided – Use Entire Disk.

If your computer is relatively new, chances are it has a SATA-based hard disk. If so, the first hard disk will be identified as *sda*, the second as *sdb*, the third as *sdc*, and so on. All that changes in each case is the last letter: a, b, c, and so on.

If your computer uses IDE-based hard disks, the drives will also be identified as *sda*, *sdb*, and so on. The primary master drive in the system is identified as *sda*, the primary slave as *sdb*, the secondary master as *sdc*, and so on. The drive will also be identified by make and model, which may help you identify it.

Assuming the second hard disk is installed as a slave on the primary channel, as is the standard configuration for an additional hard disk, it will be identified as *sdb*, so make that selection. If the disk is installed as the slave on the secondary channel (that is, the same channel as the DVD-ROM drive), it will be identified as *sdd*.

After you've selected the disk, click the Forward button.

Manually Edit the Partition Table

If, for any reason, you find that Ubuntu's default partitioning choices are not for you, you can opt to manually edit the partition table. There are essentially two stages to work through if you choose this option:

- You're given the chance to repartition the disk manually. You can resize or delete any existing partitions and create the partitions Ubuntu needs.
- While creating/editing the partitions, you'll be asked to assign *mount points*. You'll be prompted to tell Ubuntu which of the partitions on the disk it should use for the *root file system* (that is, the main partition for Ubuntu's use) and which should be used for the *swap partition*.

Manually partitioning offers ultimate flexibility but requires a relatively high level of knowledge of how Ubuntu works. Therefore, we recommend that only experts undertake this step, unless you have no other choice because the default Ubuntu partitioning choices do not offer what you need or do not work properly for you.

In the following steps, we explain how to resize an existing partition, create the new partitions that Ubuntu needs, and assign mount points so that Ubuntu is able to use them.

Tip GParted is a graphical partition tool that you can use to add, edit, and delete partitions easily. GParted looks similar to the third-party commercial partition tools you may have already used. You can run this utility by starting Ubuntu in live distro mode and selecting System ► Partition Editor from the menu. Once you have made the desired changes with this partition editor, you can reboot and start the Ubuntu installer again. Then when you manually edit the partitions in the installer, you need to set mount points only on the partitions that you created in GParted.

Prepare Partitions

When the disk partitioning choices appear, click the Manual radio button and click Forward. The Prepare Partitions window will appear. This window lists the hard disks detected by Ubuntu and their corresponding partitions. Each item has the following properties:

- **Device:** This is the logical representation of the hardware device in Ubuntu. See the previous section for an explanation of the drive identification, but note that here the drive references are preceded with `/dev`. You can ignore this. The numbers at the end refer to the order of partitions. For example, `sda1` refers to the first partition of the first hard disk, and `sda2` refers to the second partition of the first hard disk.
- **Type:** This specifies the file system type of the partition. For example, NTFS and VFAT are Windows file systems, `ext3` indicates the Ubuntu partition, and `swap` indicates a swap file partition.
- **Mount point:** The mount point is how Ubuntu will see the partition once it is up and running. At least one partition needs to be mounted as root. Mounting is discussed further in Chapter 14.
- **Format?:** This indicates whether the partition will be formatted during installation.
- **Size:** This determines the disk space of the partition, in megabytes. Note that the strict definition of the word megabyte is used, meaning 1,000,000 bytes, rather than the more commonly understood 1,024,000 bytes (1,024KB). To confuse matters, the 1,024KB definition is used in the rest of the installation program.
- **Used:** This determines how much disk space has been consumed, in megabytes.

At the bottom of the window are buttons to manipulate the hard disk as a whole or each individual partition. For the hard disk, you can opt to create a new partition table. This effectively returns the disk to as-new status, with no partition information, so creating a new partition table is tantamount to erasing the whole hard disk. Be sure you know what you're doing! For unallocated free space, you have an option to create a new partition. For an existing partition, you have an option to edit its properties (this option lets you resize the disk and assign a mount point) or delete the partition to accumulate free disk space. You also have an option to undo all hard disk changes, which applies to all desired changes except resizing a partition, because resizing is carried out as soon as you select to do so, unlike the other changes, which are carried out after working through all the installation stages.

You want to resize the main NTFS (Windows) partition. Search for that partition in the partition type list; it will be shown as `ntfs`.

Determine Windows Partition Size

Once you have found the NTFS partition, you should determine how much space should be retained in your Windows partition so that Windows will still function properly while providing a sufficient amount of space for Ubuntu. At the bare minimum, your Windows partition should have 2GB of available disk space for new applications, software upgrades, and your data.

You should free up as much space as possible for Ubuntu. But if disk space is a concern, you will need to determine the minimum of disk space that should be put aside for the main and swap partitions of Ubuntu.

The main partition will contain the Ubuntu operating system itself. The main partition should have at least 3GB of disk space (2GB for the base installation and the rest for new applications, software upgrades, and your data).

The swap partition is similar to the swap file under Windows (sometimes referred to as *virtual memory* or the *paging file*), except that it resides on its own partition. The swap partition acts as additional memory should the main memory become full. Because accessing the hard disk takes longer than accessing the RAM, using the swap partition is undesirable and is a last resort. However, all operating systems need this partition just in case. Additionally, the swap file is used when the computer enters Hibernation (Suspend to Disk) power-saving mode.

The size of the swap partition depends on the size of your physical RAM. See Table 5-1 for some suggestion. However, if you want to use the Hibernation feature on your computer, your swap partition size should be at least equal to the size of the physical RAM.

Table 5-1. *Suggested Swap Partition Sizes for a Desktop Ubuntu System*

Physical RAM Size	Swap Partition Size ^a
512MB	1024MB
1024MB (1GB)	1025MB
2048MB (2GB)	2049MB
3072MB (3GB)	3073MB
4096MB (4GB)	4097MB

^a Swap partition sizes have been adjusted to take into account the strict definition that 1 megabyte = 1,000,000 bytes, as stated in the Create Partition dialog box.

Once you have determined the size of your main and swap partitions, total their sizes. This is how much free space you need to allocate for Ubuntu.

Edit Partition Properties

In the Prepare Partitions window, select the NTFS partition and click Edit to change its properties. In the Edit Partition dialog box, shown in Figure 5-10, you can edit three partition properties:

- **New partition size in megabytes:** This allows you to adjust the size of the selected partition. If you reduce the size of the selected partition, the remaining space will be allocated for free space. For example, if you have an NTFS partition with a size of 104,847MB and you would like to allocate 4,096MB for Ubuntu, you would need to reduce the size of the NTFS partition to 100,751MB. Adjust the size of the NTFS partition as you determined in the previous step.
- **Use as:** This either changes or displays the file system of the selected partition. The current file system is NTFS, because you are editing a Windows partition, so select ntfs from the list if it isn't already displayed. Be careful not to select any of the other entries from the list, because this could damage your Windows setup irreversibly.
- **Mount point:** Ubuntu makes non-Linux file systems (such as Windows) available by *mounting* them. Mounting is explained in Chapter 14, but for now, it's enough to know that Ubuntu creates a “fake” directory through which the contents of the partition can be accessed. You can either select one of the default suggestions (on our test system, these were /dos and /windows) or type your own path (but only if you know what you're doing).

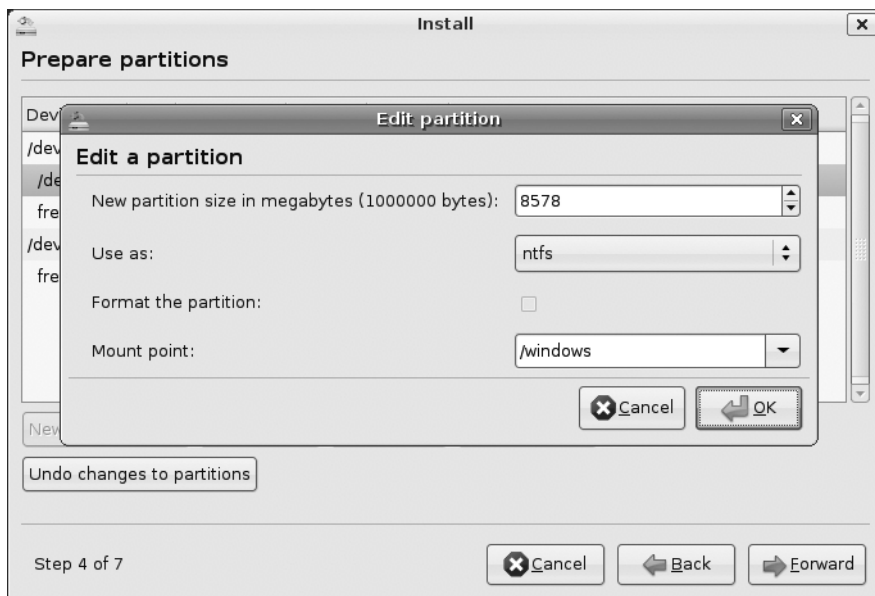


Figure 5-10. Enter the new size of the partition in the New Partition Size text box.

Once you are satisfied with your choices, click the OK button. At this point, you are prompted to confirm that your desired changes will be made to the disk, as shown in Figure 5-11. Double-check your settings, because your confirmation will make the disk changes permanent. Click Continue when you're ready to start the resizing process. After the process is finished, you will have free space to allocate for Ubuntu.

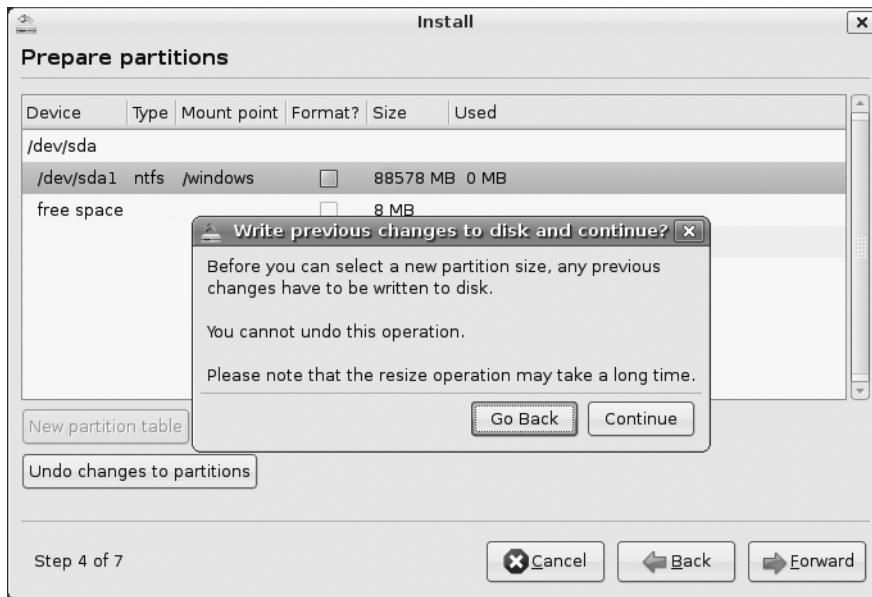


Figure 5-11. *Ubuntu prompts you to confirm your choice of resizing the partition because the disk changes will be made permanent.*

If you see an error message while trying to resize the partition, it's likely that Windows was not shut down correctly. To fix this situation, exit the Ubuntu installer, reboot Windows, and opt to check the disk. Then reboot so the check can take place. After that, reboot again, ensuring Windows is properly shut down. Then you can return to the Ubuntu installer.

Create Main and Swap Partitions

The next step is to create partitions with the free space. Select the new free space you have created and click the New Partition button. The Create Partition dialog box will appear, as shown in Figure 5-12. This dialog box has five options:

- **Type of new partition:** This option allows you to set the partition as primary or logical. Unless the hard disk has more than one operating system installed, you should select the Primary option. With primary partitions, you can divide your hard disk up to only four partitions. If you need more than four partitions, or if there are already three partitions on the disk, select the Logical option.
- **New partition size in megabytes:** This option sets the number of megabytes that will be allocated to the new partition. The default value takes all of the free space.
- **Location for the new partition:** This option specifies if the new partition will be created on the beginning or end area of the free space. It's recommended that you use the beginning. This way, the free space can be seen easily, since it always appears just below all of the partitions.
- **Use as:** This option specifies the file system of the new partition. The default option of Ext3 Journaling File System is fine when you are creating the main partition.
- **Mount point:** The mount point is a directory that will act as a location where you can make a disk accessible. The main partition you create for Ubuntu must be mounted as root. This is always represented as a single forward slash (/).

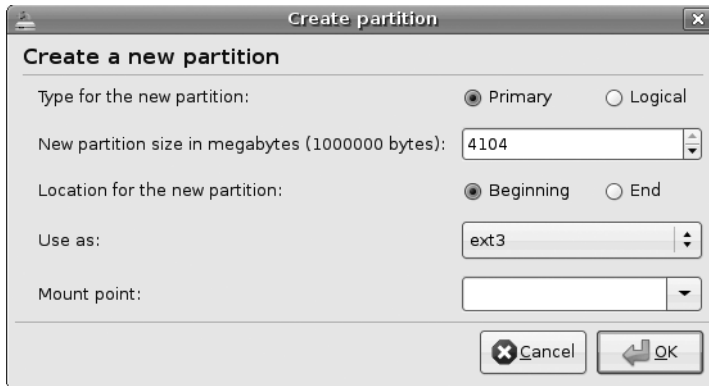


Figure 5-12. You can create a new partition as long as there is free/unallocated space available.

Start by creating the swap partition. You've already determined the size of this partition in a previous step. Enter the desired partition size and change the Use As option to Swap Area. Leave the rest of the options untouched (note that the swap partition doesn't need a mount point). For example, if the size of the physical RAM is 1GB, the partition size for the swap partition should be set to 1025MB, as shown in Figure 5-13. Click OK to continue.

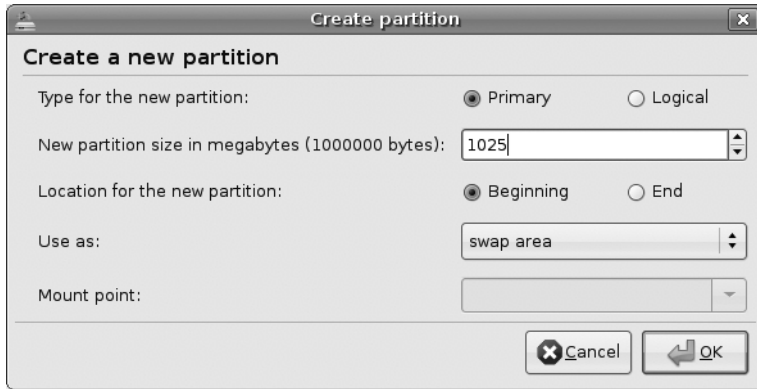


Figure 5-13. The size of your swap partition depends on the amount of physical RAM in your computer.

Next, create the main partition. Select the free space and click the New Partition button to open the Create Partition dialog box again. For the Mount Point option, select the forward slash (/) to specify that this partition is the main partition or root file system. Your dialog box should look similar to the one shown in Figure 5-14. Click the OK button to continue.

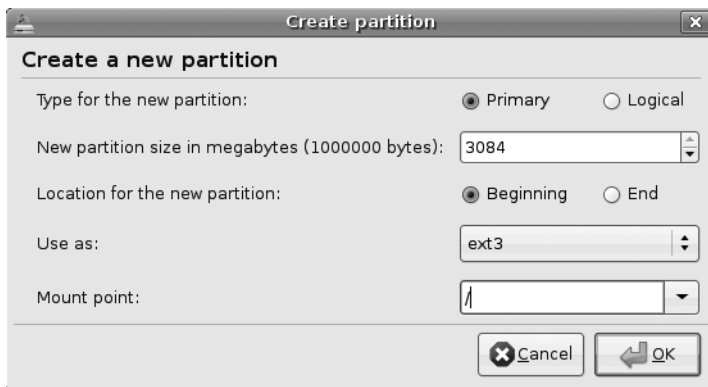


Figure 5-14. The main partition is denoted by a forward slash (/) as the mount point.

You should now have Windows (NTFS), swap, and main partitions, as shown in Figure 5-15. Click Forward to continue.

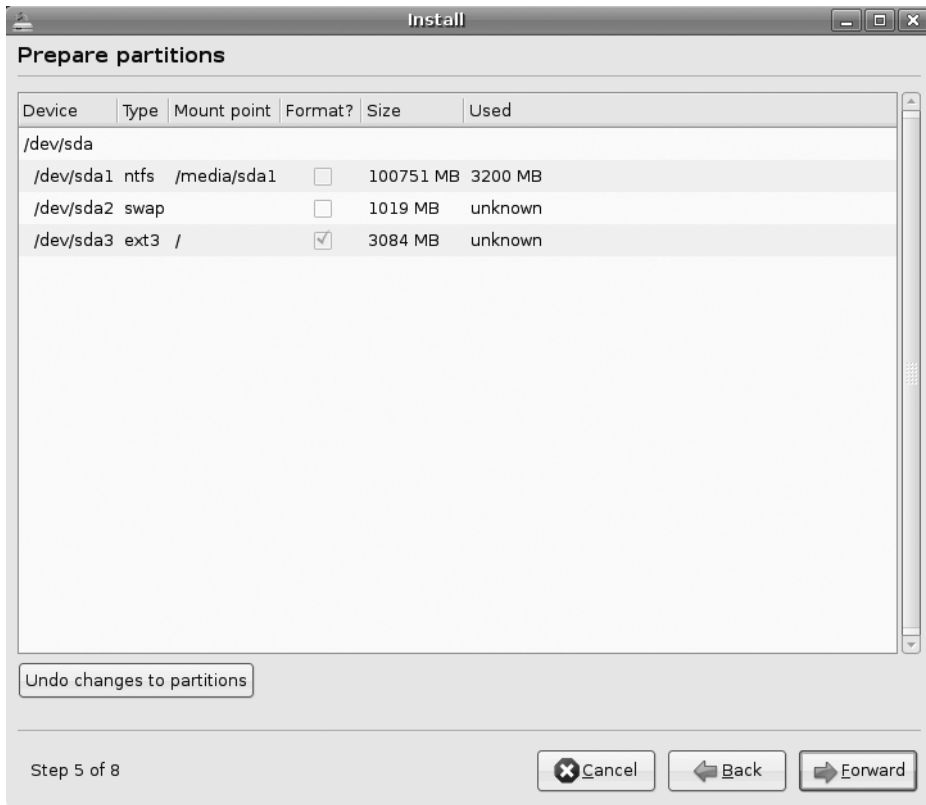


Figure 5-15. You should have Windows (NTFS), swap, and main partitions before continuing.

Stage 9: Enter a Username

Next, you'll be prompted to enter your real name and your username. *Real name* refers to how you'll be formally identified on the system to anyone who uses the system and should be typed into the What Is Your Name? text field. The standard practice is to use your full name, including first and last names, separated by a space.

The username is how the computer itself will identify you, and this should be typed into the What Name Do You Want to Use to Log In? text field. This name needs to be unique; two users on the same computer cannot have the same username. Also, it must follow these rules:

- The username should be one word without any spaces in it.
- You can choose any username consisting of uppercase and lowercase letters and numbers, but not symbols and punctuation.
- The username cannot begin with an uppercase letter, although you can use uppercase in the rest of the name.

The simplest procedure for choosing a username is to use your own first name, typed entirely in lowercase letters. For example, if your name were John Smith, you would type **John Smith** in the What Is Your Name? box and **john** as your username, as shown in Figure 5-16.

The screenshot shows the 'Who are you?' window in the Ubuntu installer. It has a title bar with 'Install' and standard window controls. The main content area is titled 'Who are you?' and contains the following elements:

- A label 'What is your name?' followed by a text box containing 'John Smith'.
- A label 'What name do you want to use to log in?' followed by a text box containing 'john'.
- A note: 'If more than one person will use this computer, you can set up multiple accounts after installation.'
- A label 'Choose a password to keep your account safe.' followed by two masked password input fields (each showing '*****').
- A note: 'Enter the same password twice, so that it can be checked for typing errors.'
- A label 'What is the name of this computer?' followed by a text box containing 'john-desktop'.
- A note: 'This name will be used if you make the computer visible to others on a network.'

At the bottom of the window, it says 'Step 6 of 8' and has three buttons: 'Cancel', 'Back', and 'Forward'.

Figure 5-16. You should enter a real name, a username, a password, and, if you wish, a name to give your computer.

Following the username, enter a password. Here, the rules are the inverse of those for your username. A good password contains numbers, uppercase and lowercase letters, punctuation marks, and anything else you can get in there! This helps make your password almost impossible for someone else to guess, and thus makes your system more secure. (If you want to be really secure, create a password that's ten or more characters long.) You'll need to enter the password twice; the second time confirms that you didn't make a typo the first time around.

The What Is the Name of This Computer? text box contains the hostname for the computer. This is how the computer is identified on certain types of networks, if you choose to share files or resources with other computers. It is also the name that will

appear at the front of the command-line prompt, as described in Part 4 of this book. Ubuntu will fill in this field automatically based on your username, but you can replace that with something else more personal. The rules for the hostname are broadly similar to those for the username; it cannot contain spaces or symbols. For example, if your computer is a Dell PC, you might type **Office_Dell** (note that you can use an underscore character in place of a space character).

Once you're finished, click the Forward button.

Stage 10: Import Documents and Settings

The next step is to migrate accounts by importing documents and settings of existing user accounts from your Windows partition to Ubuntu. (You won't be prompted to do this if you're installing Ubuntu on a fresh hard disk or have chosen to overwrite your Windows partition.) Just check the items you would like to import to your account, as shown in Figure 5-17. Then click the Forward button to continue.

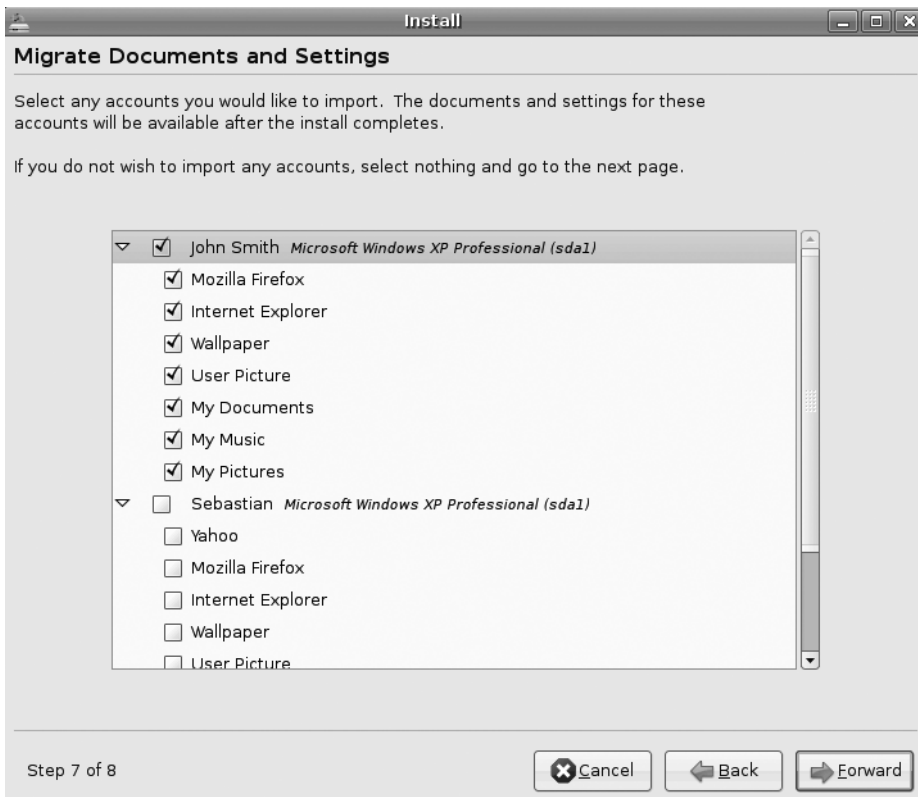


Figure 5-17. Check the items you would like to migrate from Windows to your account.

Stage 11: Confirm Installation Choices

At this point, you'll see the Ready to Install window, which lists the choices you've made, as shown in Figure 5-18. It's a good idea to check to make sure everything is correct before clicking the Install button.

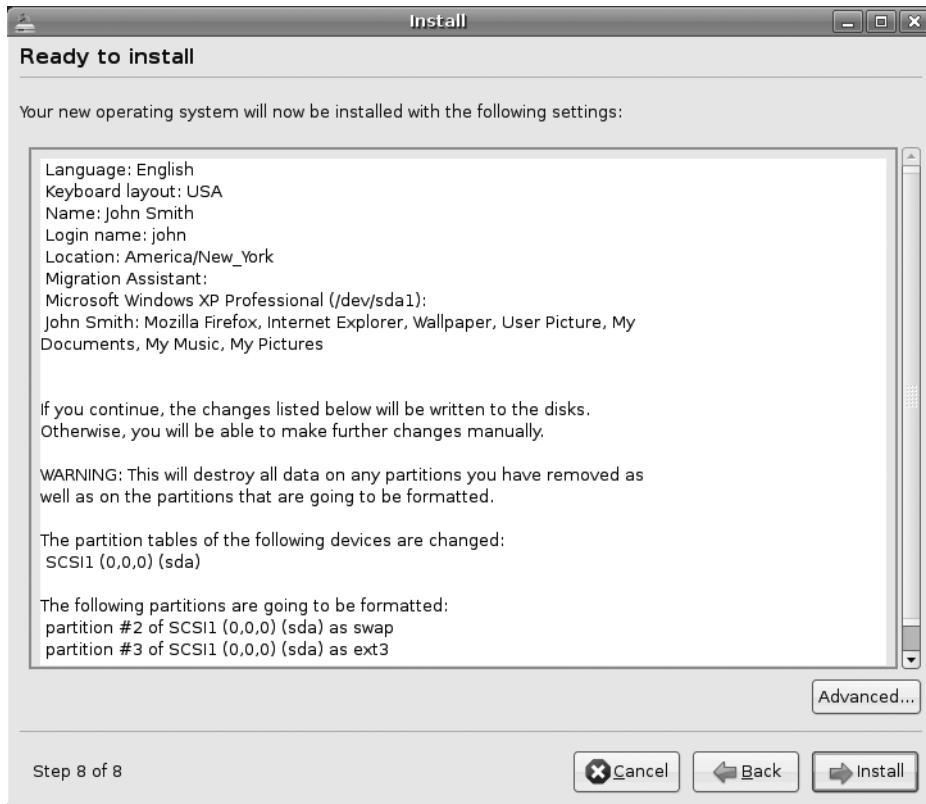


Figure 5-18. Confirm the installation choices, and click the *Install* button to format the new partitions and copy the Ubuntu files across.

When you're ready to install Ubuntu, click the *Install* button. This will start the installation procedure. The new partitions you created will be formatted, and the Ubuntu files will be copied across.

If you click the *Advanced* button (which isn't required), you will be prompted to customize the boot loader and join the popularity contest, as shown in Figure 5-19. For the boot loader settings, you have the option not to write the boot loader to the disk. The option makes sense if you already have an existing boot loader, perhaps from another Linux installation, and you would prefer to use it as the primary boot loader for all the operating systems installed on your computer. Checking the *Popularity Contest* option allows Ubuntu to poll program/package usage in your system and report this information to a central

server to generate overall statistics on package usage. This information helps Ubuntu developers prioritize which packages to work on based on popularity. The statistics are available at <http://popcon.ubuntu.com>.

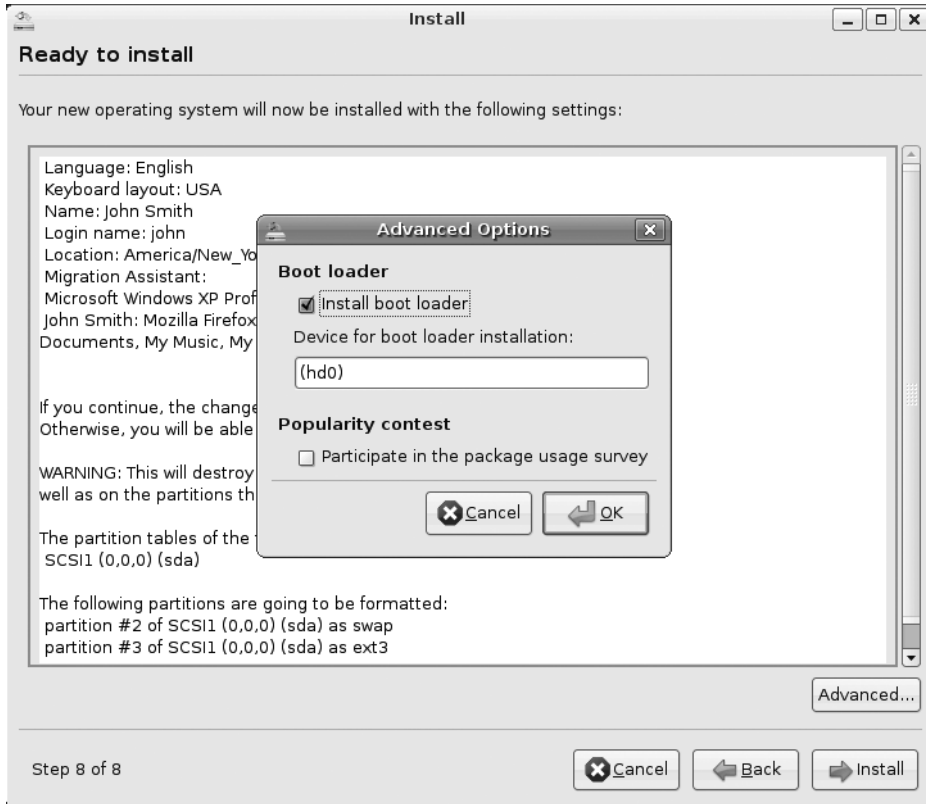


Figure 5-19. The *Advanced options* let you customize the boot loader and contribute to the popularity contest.

Stage 12: Wait During Installation

Now all you have to do is wait! The Ubuntu installation routine will copy the necessary files and install Ubuntu, as shown in Figure 5-20. It won't require any further input from you, unless something goes wrong. For example, if you've created partitions that are too small in the previous section, this is the point at which you'll be told. If you do encounter an error, the installation program will quit, and you will need to start it again by clicking the icon on the desktop, this time altering your choices accordingly.

Installation should take no more than 30 minutes, and it completed in half that time on most of our test systems.

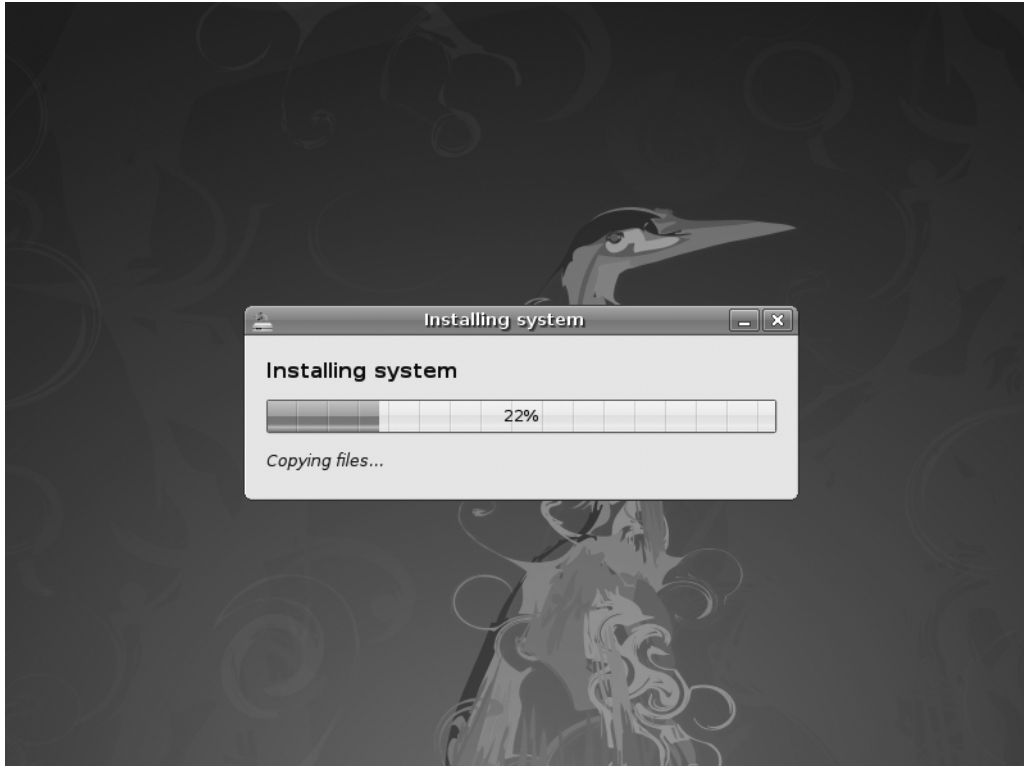


Figure 5-20. *All you have to do now is wait while the Ubuntu files are copied across!*

Stage 13: Reboot and Enjoy Ubuntu!

When installation has finished, a dialog box will appear telling you to restart the computer. Once you click the Restart Now button, the DVD will be ejected automatically, and it's important that you remove it, so that you don't accidentally boot Ubuntu's installer again when you restart. In fact, Ubuntu will ask you to remove the disk and press Enter to confirm the removal.

Following this, the system will restart. If you've installed Ubuntu on a computer that contains Windows, you'll first see the GRUB boot menu. This offers a number of choices, including the chance to boot Ubuntu into recovery mode, which can help fix your computer (discussed in Chapter 6). You can also choose to boot into Windows. You can switch between the menu choices by using the arrow keys; press Enter to make your selection.

You can also run Memtest86, as described previously in stage 4. However, most users can simply press Enter when the menu appears, which will select the topmost entry, thereby booting Ubuntu in normal mode. Alternatively, after 10 seconds, the default choice will be automatically selected.

If you installed Ubuntu onto a computer or hard disk without any other operating system, you'll see a brief countdown timer, during which you can press any key to make

the boot menu appear. Otherwise, it will be hidden, and after the countdown has finished, Ubuntu will start its boot procedure.

Once the boot menu is out of the way and after a few seconds have passed while Ubuntu loads, you'll see the Ubuntu login screen, as shown in Figure 5-21. From here, you can progress to Chapter 7 to learn how to get started. Alternatively, if you've run into any problems, see Chapter 6.



Figure 5-21. *When the computer has rebooted after installation, the standard Ubuntu login screen will appear.*

INSTALLING UBUNTU ON AN APPLE MAC

Ubuntu can also run on Apple Macintosh computers, as well as PCs, and the DVD-ROM supplied with this book contains everything you need. However, the instructions vary depending on the processor installed in your Macintosh. To find out which type of processor your Mac uses, click the Apple menu and select About This Mac. In the summary dialog box, look for the Processor heading. If the line reads "PowerPC," see the instructions under that heading. If the line contains "Intel" in combination with any other words, such as "Intel Core Duo," continue with the following instructions.

Intel

If your Mac contains an Intel processor, you might be able to boot from the DVD-ROM supplied with this book and use it to install Ubuntu. However, some extra steps are necessary. If you're using OS X 10.5, also known as Leopard, you can use Apple's Boot Camp utility (located in Applications ► Utilities) to resize the existing OS X partition. Boot Camp is also used to provide a boot menu to let you switch between OS X and Ubuntu. However, Boot Camp is designed to allow Windows to be installed alongside OS X, so some additional steps are necessary to make it work with Ubuntu. A full guide is provided at the official Ubuntu wiki: <https://help.ubuntu.com/community/MacBook>.

If you're running OS X Tiger (10.4), you may want to look into using third-party boot menu software called rEFIt (<http://refit.sourceforge.net>). This utility can also be used in Leopard in place of Boot Camp.

Once the computer has been correctly configured by following the guide, you can boot from the DVD-ROM and follow the instructions in the rest of this chapter. Hold down the C key (or Cmd+Shift+Option+Delete on older systems) when the Apple symbol appears during booting to boot from the DVD-ROM disc.

PowerPC

Ubuntu also works on a Mac based on a PowerPC processor although a special version must be used. Note that the only version commercially supported by Canonical, the company that sponsors Ubuntu, is the older 6.06 release. Newer versions are supported solely by the community. The PowerPC version of Ubuntu on Side B of the DVD-ROM is the 8.04 release of Ubuntu, and is supplied as an .iso image. You'll need to manually burn this to a blank CD-R or CD-RW, and then boot from it to install Ubuntu. However, first you must create some free space on the hard disk, so you can install Ubuntu alongside your existing operating system (assuming you want to dual-boot OS X and Ubuntu; if you want to let Ubuntu use the entire hard disk, the Ubuntu installer will be able to wipe the existing partitions, and no further action is necessary). Boot from the OS X installation DVD-ROM and quit the installer. Then use Disk Utility from the menus to resize the hard disk in order to make space.

To create the Ubuntu install CD, boot to OS X. Next, insert the DVD-ROM with Side B topmost and copy the `ubuntu-8.04.1-desktop-powerpc.iso` file to the desktop. Insert a blank CD-R or CD-RW, and then start Disk Utility. Select Images ► Burn, navigate to the `ubuntu-8.04-desktop-powerpc.iso` file on the desktop, and then click the Burn button. When the burn has finished, use the disc to boot from and install Ubuntu, following the instructions provided in this chapter. Hold down the C key (or Cmd+Shift+Option+Delete on older systems) when the Apple symbol appears during booting to boot from the CD.

Summary

By following the steps outlined in this chapter, you should now have Ubuntu installed on your computer. We've tried to provide you with enough information to get around any problems, as well as explain exactly what's happening every step of the way.

Alas, it's still possible that you encountered hurdles that weren't addressed here. In the next chapter, you'll find solutions to common problems associated with Ubuntu installation.