

## CHAPTER 2

# Post-Installation Configuration

Now that the hard bit is out of the way (installing Ubuntu) you can begin to customize your new operating system. By default, Ubuntu presents you with a pretty blank canvas with which to personalize your experience. Some people choose to stick with the chocolate colored background, while others go for a full make over.

In this chapter, we'll take a look at getting up and running with Ubuntu, including a quick tour around the desktop. We will also take a look at some of the ways in which you can customize your Ubuntu installation, such as ensuring that date and time settings are correct, as well as show you how to do some basic administration tasks, such as identifying any problems with hardware. By the end of this chapter, you should feel comfortable enough to move on through the rest of the book.

### NOTE

Throughout this chapter, we introduce you to several key applications relevant also to other chapters of this book. We include them here because they are essential to getting your system to work as you intend. You will find it worthwhile referring back to this chapter as you work your way through the book.

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## Troubleshooting Post-Installation Configuration Problems

A lot of work has gone into Ubuntu to make it as versatile as possible, but sometimes you may come across a piece of hardware that Ubuntu is not sure about. Knowing what to do in these situations is important, especially when you are working with Ubuntu for the first time.

Because Ubuntu (and Linux in general) is built on a resilient UNIX foundation, it is much more stable than other operating systems. You might find this surprising if you are used to the Blue Screens of Death found on a certain operating system from Redmond, Washington. However, even though things might seem to be working fine, Ubuntu could have a problem that might not affect the appearance of the system. Perhaps kernel modules for devices will not load, for example, or services cannot start for some reason. In this section, you learn how to examine some of Ubuntu's built-in error logs to help you diagnose any unseen faults. Ubuntu has a command that enables you to see detailed messages that are output directly by the operating system: the `dmesg` command, which is commonly used with the `grep` command to filter output. The `dmesg` command takes its output directly from the `/var/log/messages` file, so you can choose to either run `dmesg` directly or enter `less /var/log/messages` instead. The output is fairly detailed, so be prepared for some initial shock when you see how much information is generated. You might find it easier to generate a file with the `dmesg` output by using the following command:

```
$ dmesg > dmesg.txt
```

This takes the output from the `dmesg` command and stores it in a new text file called `dmesg.txt`. You can then browse it at your leisure using `vi` or `emacs`, depending on your taste. You can even use the `less` command, like so:

```
$ less dmesg.txt
```

The messages are generated by the kernel, other software run by `/etc/init.d`, and Ubuntu's runlevel scripts. You might find what appear to be errors at first glance, but some errors are not really problems (for example, if a piece of hardware is configured but not present on your system).

Thanks to Google, troubleshooting is no longer the slow process it used to be. You can simply copy and paste error messages into Google and click Find to bring up a whole selection of results similar to the problem you face. Remember, Google is your friend, especially <http://www.google.com/linux>, which provides a specialized search engine for Linux. You can also try <http://marc.info>, which browses newsgroup and mailing list archives. Either way, you are likely to come across people who have had the same problem as you.

It is important to only work on a solution to one problem at a time; otherwise, you may end up getting no work done whatsoever. You should also get into the habit of making backup copies of all files that you modify, just in case you make a bad situation worse.

Use the copy command like this:

```
$ cp file file.backup
```

You should never use a `.bak` extension because this could get overwritten by another automatic process and will leave you frustrated when you try to restore the original file.

If something breaks as a result of you changing the original file, you can always copy the original back into place using the command like this:

```
$ cp file.backup file
```

(Something as simple as this can really save your bacon, especially when you are under pressure when you've changed something you shouldn't have on a production system. That is, if you are daft enough to make sweeping changes on a production system!)

## The sudo command

If you have come across Linux, you are probably aware of the command line. As you will find as you work through this book, Ubuntu puts a lot of reliance upon the `sudo` command while working at the command line. This command is used in front of other commands to tell Ubuntu that you want to run the specified command with super user powers. This sounds really special, and it actually is. When you work using the `sudo` command, you can make wide-ranging changes to your system that impact the way it runs. Be extra careful when running any command prefixed with `sudo`, however; a wrong option or incorrect command can have devastating consequences.

The use of `sudo` is straightforward. All you have to do is enter it like this:

```
$ sudo command commandoptions
```

Just replace the word *command* with the command that you want to run, along with any options. For example, the following command opens your `xorg.conf` file in `vi` and enables you to make any changes as the super user before being able to save it:

```
$ sudo vi /etc/X11/xorg.conf
```

Whenever you execute a command using `sudo`, you are prompted for your password. This is the same password that you use to log in to Ubuntu, so it is important that you remember it.

Sometimes, however, you may want to work with a classic root prompt instead of having to type `sudo` in front of every command (perhaps if you have to work with lots of commands at the command line that require super-user access, for example). `sudo` enables you to do this by using the `sudo -i` command. Again, you are prompted for your password, which you should enter, after which Ubuntu gives you the standard root prompt, as follows:

```
#
```

From here, you can execute any command without having to keep entering `sudo`.

## First Update

As discussed in Chapter 1, you should update your software as soon as you log in to Ubuntu for the first time to benefit from any available security and bug fixes. In that example, we used the Update Manager, which is really a GUI wrapper for the command `apt-get`. In the background, Ubuntu automatically polls the software repositories configured as standard to determine whether any updates are available. When it detects that new versions of installed software are available, a pop-up message appears in the upper-right corner of your screen (see Figure 2.1). By clicking the Updates icon in the panel, you automatically open Update Manager, but not before you are prompted for your password (because you are about to make a systemwide change).

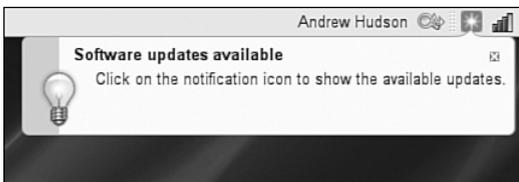


FIGURE 2.1 A quick and easy way to get updates installed is to look for the update notification.

Another way of updating your system, and one that can be quicker than Update Manager, is to use the command line. If you go to the Applications, Accessories menu and select the Terminal option, a blank screen displays. This is the command line (commonly referred to as the *terminal*) and is one of the most powerful features of Linux. It is covered in more detail in Chapter 30, “Command Line Masterclass,” so we won’t delve too deeply here.

You are greeted with a prompt similar to the one here:

```
andrew@optimus:~$
```

A blinking cursor also displays. Ubuntu is awaiting your first command. Here we want to issue the following command:

```
$ sudo apt-get update
```

This command tells the package management utility `apt-get` to check in with the configured repositories and check for any updates for installed software. In a matter of seconds, Ubuntu completes all of this and your screen should look something like this:

```
$ sudo apt-get update
Password:
Get: 1 http://security.ubuntu.com gutsy-security Release.gpg [189B]
Get: 2 http://security.ubuntu.com gutsy-security Release [30.9kB]
Get: 3 http://gb.archive.ubuntu.com gutsy Release.gpg [189B]
Get: 4 http://gb.archive.ubuntu.com gutsy-updates Release.gpg [189B]
```

```
Get: 5 http://gb.archive.ubuntu.com gutsy-backports Release.gpg [189B]
Hit http://gb.archive.ubuntu.com gutsy Release
Get: 6 http://gb.archive.ubuntu.com gutsy-updates Release [30.9kB]
Get: 7 http://security.ubuntu.com gutsy-security/main Packages [25.1kB]
Get: 8 http://gb.archive.ubuntu.com gutsy-backports Release [19.6kB]
Hit http://gb.archive.ubuntu.com gutsy/main Packages
Get: 9 http://gb.archive.ubuntu.com gutsy/restricted Packages [4571B]
Hit http://gb.archive.ubuntu.com gutsy/universe Packages
Get: 10 http://gb.archive.ubuntu.com gutsy/multiverse Packages [95.2kB]
Get: 11 http://security.ubuntu.com gutsy-security/restricted Packages [4253B]
Get: 12 http://security.ubuntu.com gutsy-security/universe Packages [5271B]
Get: 13 http://security.ubuntu.com gutsy-security/multiverse Packages [1677B]
Get: 14 http://security.ubuntu.com gutsy-security/main Sources [6227B]
Get: 15 http://security.ubuntu.com gutsy-security/restricted Sources [974B]
Get: 16 http://security.ubuntu.com gutsy-security/universe Sources [639B]
Get: 17 http://security.ubuntu.com gutsy-security/multiverse Sources [533B]
Hit http://gb.archive.ubuntu.com gutsy/main Sources
Get: 18 http://gb.archive.ubuntu.com gutsy/restricted Sources [1478B]
Hit http://gb.archive.ubuntu.com gutsy/universe Sources
Hit http://gb.archive.ubuntu.com gutsy/multiverse Sources
Get: 19 http://gb.archive.ubuntu.com gutsy-updates/main Packages [37.7kB]
Get: 20 http://gb.archive.ubuntu.com gutsy-updates/restricted Packages [14B]
Get: 21 http://gb.archive.ubuntu.com gutsy-updates/universe Packages [8363B]
Get: 22 http://gb.archive.ubuntu.com gutsy-updates/multiverse Packages [866B]
Get: 23 http://gb.archive.ubuntu.com gutsy-updates/main Sources [22.1kB]
Get: 24 http://gb.archive.ubuntu.com gutsy-updates/restricted Sources [14B]
Get: 25 http://gb.archive.ubuntu.com gutsy-updates/universe Sources [1823B]
Get: 26 http://gb.archive.ubuntu.com gutsy-updates/multiverse Sources [427B]
Get: 27 http://gb.archive.ubuntu.com gutsy-backports/main Packages [14B]
Get: 28 http://gb.archive.ubuntu.com gutsy-backports/restricted Packages [14B]
Get: 29 http://gb.archive.ubuntu.com gutsy-backports/universe Packages [14B]
Get: 30 http://gb.archive.ubuntu.com gutsy-backports/multiverse Packages [14B]
Get: 31 http://gb.archive.ubuntu.com gutsy-backports/main Sources [14B]
Get: 32 http://gb.archive.ubuntu.com gutsy-backports/restricted Sources [14B]
Get: 33 http://gb.archive.ubuntu.com gutsy-backports/universe Sources [14B]
Get: 34 http://gb.archive.ubuntu.com gutsy-backports/multiverse Sources [14B]
Fetched 299kB in 2s (140kB/s)
Reading package lists... Done
```

Now you need to issue the command to upgrade your software by entering the following:

```
$ apt-get dist-upgrade
```

Because you have already checked for updates, Ubuntu automatically knows to download and install only the packages it needs. The `dist-upgrade` option intelligently works with

newer packages to ensure that any dependencies that are needed can be satisfied. You can also use the option `upgrade` instead, but it isn't as smart as `dist-upgrade`.

### `apt-get` Alternatives

Ubuntu has an alternative to `apt-get` called `aptitude`. It works in pretty much the same way as `apt-get` with the exception that `aptitude` also includes any recommended packages on top of the requested packages when installing or upgrading.

## Configuring Software Repositories

Ubuntu uses software repositories to get information about available software that can be installed onto your system. By default, it only allows access to a small portion of software (even though this software is officially supported by Ubuntu). However, Ubuntu is based on a much older Linux distribution called Debian. Debian has access to more than 17,000 different packages, which means that Ubuntu can have access to these packages, too.

To do this, you need to use one of Ubuntu's GUI tools, found under System, Administration, Software Sources and shown in Figure 2.2. On the first tab (Ubuntu Software), you have five options to choose from, depending on your specific requirements. It is entirely up to you which options you check, but make sure that as a minimum the first check box is checked to allow you to select "official" software with Canonical support for Ubuntu. The more boxes you check, the wider your selection of software. It's also a good idea to make sure that the Proprietary Drivers box is checked in order to benefit from drivers that could enhance your system's performance.

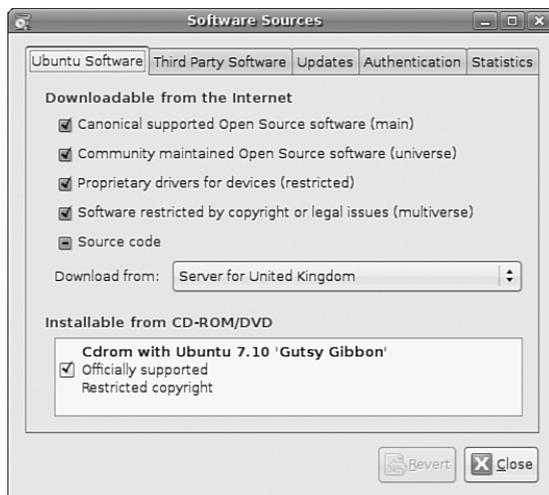


FIGURE 2.2 Enable both Universe and Multiverse repositories to allow access to a huge variety of software for Ubuntu.

## Open Source Versus Proprietary

You will hear a lot of arguments about using Proprietary drivers within Ubuntu. Some people feel that it goes against what Open Source stands for, in that the underlying code that is used for the drivers cannot be viewed and modified by the wider community (as opposed to the actual driver developers). However, there is also a strong argument that says users should have to undergo the least amount of work for a fully functional system. This is certainly the case for graphics cards, although at the time of writing AMD has announced the open sourcing of the ATI graphics driver.

Ubuntu takes a middle of the road stance on this and leaves it up to the user to either enable or disable the repository that gives access to proprietary drivers. Why not give the open source drivers a chance before plumping for a proprietary one?

Once you are happy with your selections, switch to the Updates tab to configure Ubuntu's behavior when updates are available (see Figure 2.3). By default both the important security updates and recommended updates are checked to ensure that you have the latest bug fixes and patches. You can also choose to receive proposed updates and *back-ports* (software that is released for a newer version of Ubuntu but re-programmed to be compatible with 7.10), but we'd only recommend this if you are happy to carry out testing for the community as any updated software from these repositories can have an adverse effect on your system.



FIGURE 2.3 Configure which updates you want, and you want them to be handled in the Updates tab of Software Sources.

Ubuntu also allows you to configure how often it checks for updates, as well as how they are installed. By default Ubuntu checks daily for updates and, if there are any available,

will notify you. However, you can change the frequency (something which is recommended if you want to have a structured update policy) and the actions Ubuntu carries out when it finds available updates. We recommend keeping the notification only option as this allows you to see what updates are available prior to them being installed. If you want to save time then choose Download All Updates in the Background to allow Ubuntu to silently download the updates prior to you choosing to install them.

### CAUTION

We don't recommend selecting the option which automatically installs security updates. It's important that you have the option of choosing to install updates as there is always the chance that an update may cause problems. The last thing you want is for your system to suddenly stop working because an update was installed that has broken something without your knowledge. After configuring your update options, click the Close button. Ubuntu will prompt you to say that the software information is out of date and needs to be refreshed, so click Reload to retrieve the very latest update information. After a few seconds you will be returned to your desktop and can carry on working.

## Installing Graphics Drivers

Ubuntu is extremely good at detecting and configuring graphics cards. By default it ships with a number of proprietary drivers to allow graphics cards to work and will alert you to this by using the Restricted Drivers Manager. You can then choose to enable or disable the drivers as appropriate, depending on your personal preference. (See the “Open-Source Versus Proprietary” note earlier in this chapter.)

You can find the Restricted Drivers Manager under the System, Administration menu, and it is shown in Figure 2.4.

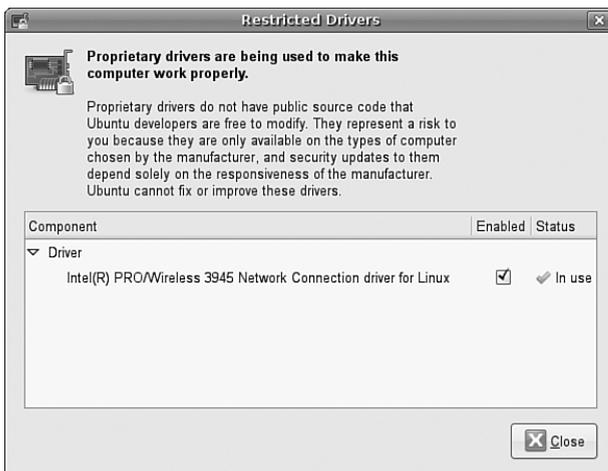


FIGURE 2.4 Toggle the usage of restricted drivers with a simple point-and-click interface. Here you can see that an Intel network driver has been enabled for use.

If you elect to use a listed proprietary driver, Ubuntu will first confirm that you are happy to proceed and then automatically download and install the driver. This may require you to log out and back in again in order for the driver to take effect.

For the most part, Ubuntu will detect and configure the majority of graphics cards from the start, and even if it has problems, it will attempt to give you a display of some sort. This feature is known as BulletProof X.

## Changing Ubuntu's Look and Feel

GNOME, the default window manager for Ubuntu, has a number of options to change how it looks and feels. The default theme is Human; this takes a blend of the GNOME Clearlooks theme, mixes it with icons from the Tango Project, and adds a little spice direct from Ubuntu. However, it is not to everyone's taste, so in this section we look at changing the visual style of Ubuntu.

### Changing the Desktop Background

Perhaps the easiest and most dramatic change you can make is to change the default desktop background. It is as simple as right-clicking on the desktop and selecting the option to Change Desktop Background to see the dialog box shown in Figure 2.5. Ubuntu comes with a small selection of wallpapers to start with, but we recommend going to the Web to find a great selection. Our favorite site is <http://www.gnome-look.org>, where you can find a great selection of desktop wallpapers.

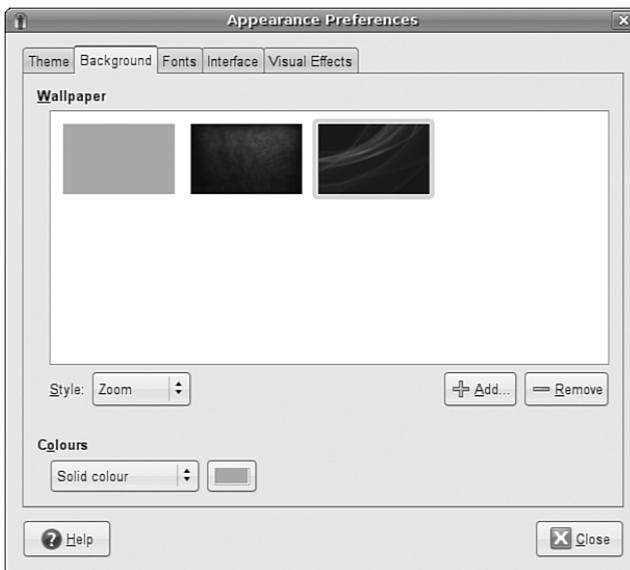


FIGURE 2.5 Choose one of the default wallpapers, or use the Add Wallpaper option to select your own image file.

As you click on a wallpaper, Ubuntu automatically applies it so that you can quickly see whether you like it. When you are happy with your selection, keep the dialog box open so we can change other aspects of the desktop.

## Changing Colors

Next up is the colors that Ubuntu defaults to. When Ubuntu was originally launched in October 2004, it came with a predominantly brown theme, leading to some users questioning the style choices of the Ubuntu development team. With Ubuntu 7.10, the brown has been replaced with a warm caramel color (which, to be honest, is only slightly better than the brown).

Thankfully, GNOME offers an array of tools to modify the defaults. Just head to the System, Preferences, Appearance option to quickly change the entire theme (see Figure 2.6). Or if you've kept the dialog box open as suggested earlier, click the Theme tab. You will see a list of predefined themes that you can choose from.

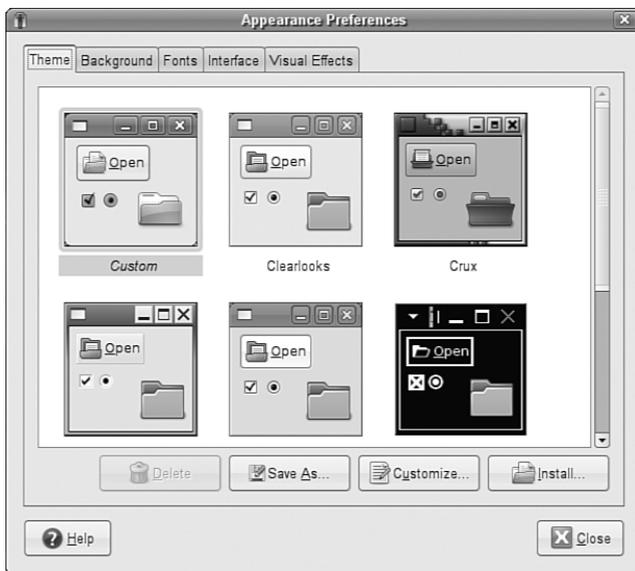


FIGURE 2.6    Either use the default themes or mix and match elements of them to match your specifications.

Alternatively, you can click the Customize button to mix up your own look and feel, as shown in Figure 2.7. You can choose to change the window decorations (title bar, minimize, maximize buttons, and so on), the general color scheme and the icon theme. As you select an option, Ubuntu automatically applies it to the desktop so you can get an idea of how it will look. When you're happy with your selections click Close to return to the main Theme dialog box and move on to the next section.

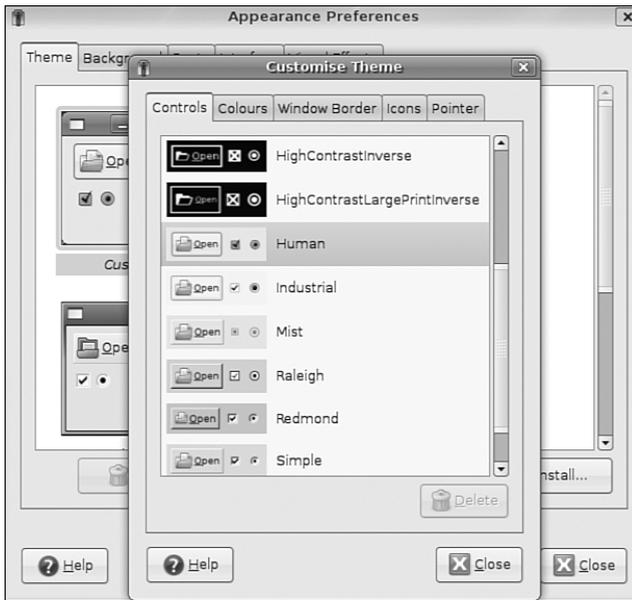


FIGURE 2.7 Use any number of combinations of icons, colors, and window decorations to give you a truly personalized look and feel.

## Modifying System Fonts

GNOME also enables you to change the fonts used throughout Ubuntu. If you have difficulty reading one font, just exchange it for another.

In the Appearance dialog box you will see a tab called Fonts. Click on this tab to see the options available for changing system fonts, which are shown in Figure 2.8. Simply click on each font name to customize the font used for that function.

For instance, you may prefer your Window Title Font to be italicized, so click the font name and select the Italic option. Clicking OK immediately applies the change, again giving you a good idea of whether it works. Sometimes a font can look good within the Font Preferences screen, but when it comes to using it you wonder why on earth you chose it. Choose your fonts wisely!

## Changing How Menu Look

You can also change the look of menus, including the location of text descriptions for each icon, by selecting the Interface tab. To be honest, there's not much to look at here,

and you would only change any of these options if you had a burning desire to replace your icons with text.

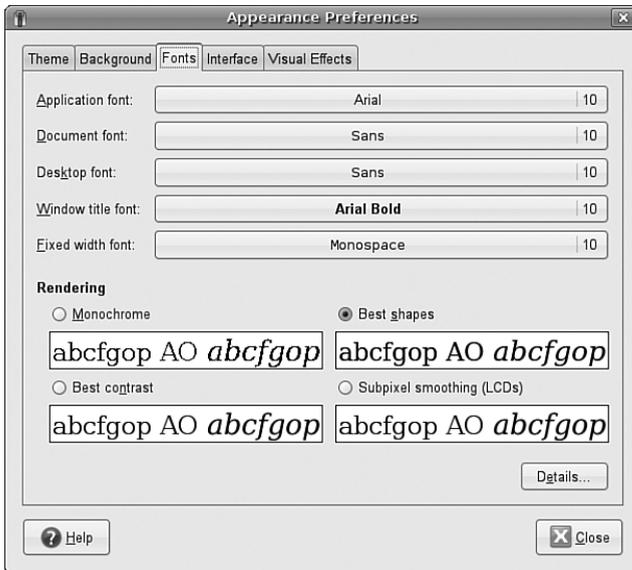


FIGURE 2.8 Keep your fonts relatively simple for ease of use, or if you prefer, indulge your love of calligraphic fonts!

## Visual Effects

Perhaps the most exciting part of Ubuntu 7.10 is that by default it comes with some pretty snazzy visual effects to enhance the look and feel of your desktop. Click the Visual Effects tab to see the options available for configuring the level of effects, shown in Figure 2.9. In keeping with Ubuntu's philosophy of keeping things simple, there are three options to choose, from which you can elect to turn off all visual effects, use a basic set of effects, or use a lot of visual effects. If you choose this last option you will need to have a fast computer (that is, purchased after 2004) to ensure that the computer doesn't grind to a halt while rendering effects.

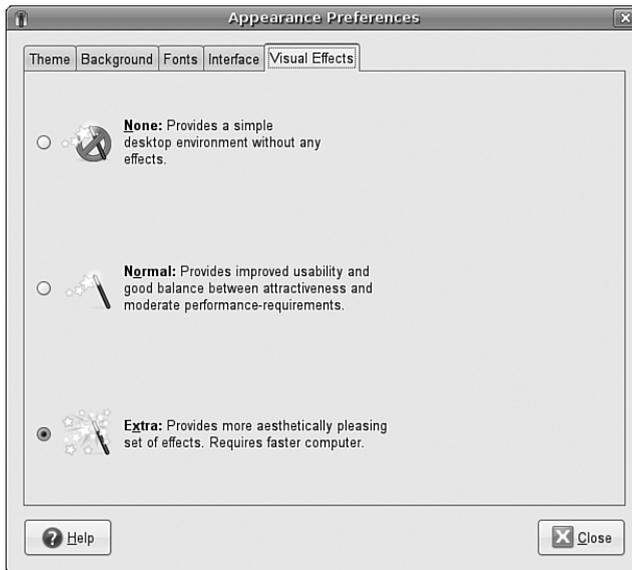


FIGURE 2.9 Wow your friends and colleagues by activating visual effects to enhance your user experience. Alternatively, switch them all off if you get a bit overwhelmed by windows flying everywhere!

## Preferred Behaviors

Ubuntu can detect and adapt to certain events that happen when you plug something into your computer or if you click on a link. Sometimes you may want Ubuntu to open one application rather than another, or sometimes to not do anything at all. This is called Ubuntu's behavior, and you can modify it to work as you want it to.

You can find the two main tools you need to do this under the System, Preferences menu, and you need use either Preferred Applications or Removable Drives and Media.

### Preferred Applications

Preferred applications are the applications that Ubuntu calls upon when it wants to open an Internet site, an email, or a terminal (see Figure 2.10). Ubuntu makes it easy for you by automatically detecting the available options for you. Alternatively, if you want to specify your own particular application that may not appear in the list by default, select the Custom option within the application type and enter the command used to launch the application into the field along with any options, arguments, or switches that you want to use.



FIGURE 2.10 Setting preferred Internet applications.

## Removable Drives and Media

In an increasingly connected world, you will find yourself plugging all sorts of devices and widgets into your computer. For the most part, it is usually multimedia files that you want to launch in a specific way. Ubuntu provides a great tool to configure the consequences of everything from plugging a digital camera into your computer, inserting a film DVD, and even plugging in a graphics tablet.

This handy tool goes by the catchy name of Removable Drives and Media, or to call it by its proper (package) name, `gnome-volume-properties`. With this tool, you can select the default command to run when Ubuntu detects the presence of a new drive or piece of hardware. Unlike the Preferred Applications tool, this tool does not detect the options for you, instead relying on you knowing the command needed to execute the correct application.

For example, in Figure 2.11, you can see the options for handling digital images in Ubuntu. Rather than using `gthumb` to import pictures from a digital camera, I want Ubuntu to use `F-Spot`, a cool photo management and editing application available through `synaptic`. In this case, I need to enter the `f-spot` command in the Command field and make sure to check mark the `Import Digital Photos When Connected` option.

Now when I connect my digital camera after a hard day's snapping, GNOME will detect its presence and launch `F-Spot`, ready for it to import my pictures directly into its library.

Other options include GNOME's behavior when removable drives (USB pen drives and the like) are connected, what to do in the event of a PDA or scanner being connected, and even more obscurely, what to do when a USB mouse is plugged in.



FIGURE 2.11 Take the hard work out of importing digital images by configuring `gnome-volume-properties` to work the way you want.

## Input Devices

The primary interface between you and your computer is your keyboard and mouse. Both of these are essential to the correct usage of your computer, so it is important that they are configured correctly. Windows users will be familiar with the basic options available, so it could come as somewhat of a shock to learn that you can do a few more nifty things with a keyboard and mouse in Ubuntu.

### Keyboard Shortcuts

If you have used a computer for more than a few years, you probably long for keyboard shortcuts for popular commands. Ubuntu allows you to set your own keyboard shortcuts for a wide variety of system commands. The easy-to-use Keyboard Shortcuts option under System, Preferences lists a lot of different actions that you can program shortcuts for (see Figure 2.12).

If you have one of those multimedia keyboards with lots of extra keys, this is the place to configure their use. Just click on the shortcut next to the action you want to configure and press the key that you want to map to this action. Repeat this until you have exhausted all the combinations that you want to configure. Then click Close to finish.

### Keyboard Layout

Getting the layout of your keyboard right can make a huge difference in how you work. When you installed Ubuntu (see Chapter 1), you would have specified the default keyboard layout to use. However, there may be times when you need to switch layouts, which you can do using the Keyboard tool in the System, Preferences menu (see Figure 2.13).



FIGURE 2.12 Make your life easier and your work go more quickly by configuring useful keyboard shortcuts.



FIGURE 2.13 Use the Keyboard Layout tool to ensure that you have your keyboard settings configured correctly.

Certainly, I've had to configure this for my wife. You see, in the United Kingdom our @ key is located to the right of the colon/semicolon key, whereas in the United States it is located on the number 2 key. My wife spent quite a few years in the States and got used to the U.S. keyboard layout. So instead of her having to learn a new layout, I just configured her login

to use the U.S. layout and mine to use the U.K. layout, which has saved us from a number of arguments!

However, you can also use the Keyboard Layout tool to configure special key behaviors. For instance, some people prefer to swap the Caps-Lock and left Ctrl key around. You can set this option and others in the Layout Options tab. If you are not yet an l33t hacker, experiment with what's on offer; you may get some benefit from these customizations.

Finally, Ubuntu can also configure and enforce typing breaks, all in the name of good health. Simply set the length of working time, the duration of the break, and whether you want to be able to postpone. When this is activated at the end of the first length of working time, Ubuntu locks the computer and will not let you log back in until the break duration has passed. Of course, if you are in the middle of something important, setting the Postpone option may prove useful.

## Mouse

There's not really much to configuring a mouse. Ubuntu does a great job of detecting most mice, except that it's not so good at configuring extra buttons over and above the left and right button and scroll wheel. The most useful option here is the Locate Pointer option, which highlights the mouse pointer when you press the Ctrl key. Of course, if you are left-handed, you can also swap the mouse buttons over, but this is a matter of personal preference.

## Detecting and Configuring a Modem

More than 38 million users in the United States and another 85 million users around the world now connect to the Internet with cable or *digital subscriber line (DSL)* service, but for many users a modem is the standard way to connect with an *Internet service provider (ISP)* using the *Point-to-Point Protocol (PPP)*. Other common tasks for modems include sending and receiving faxes. If you add or change your modem after the initial installation, you must configure Ubuntu to use the new modem to perform all these tasks.

Ubuntu includes several tools you can use to configure and use an internal or external modem in your notebook or PC. Chapter 14, "Networking," contains the details about configuring Ubuntu to connect to the Internet using a modem. This section covers how to configure and use modems using serial ports (using a standard formerly known as RS232, but now called *EIA232*) or USB.

## Configuring a Serial-Port Modem

Linux uses `/dev/ttySX`, `/dev/ttyUSBX`, or `/dev/usb/ttyUSBX` for serial ports, where *X* can range from 0 to 15. You can add many additional ports to a system using multiport cards or chained USB devices. A PC's integral serial ports are generally recognized at boot time. To see a list of recognized ports for your system, pipe the `dmesg` command output through the `fgrep` command, as follows:

```
$ sudo dmesg | grep tty
ttyS00 at 0x03f8 (irq = 4) is a 16550A
ttyS01 at 0x02f8 (irq = 3) is a 16550A
```

In this example, the `grep` command reports that two serial ports have been recognized in the `dmesg` output. Note that the device matching `ttys00` is `/dev/ttyS0`, despite the kernel output. The PC's external modem can be attached (most likely using a male DB9 adapter) to either port. Under Linux, nearly all modem-dependent software clients look for a symbolic link named `/dev/modem` that points to the desired device. This link is not created by default; as root, however, you can create this device manually using the `ln` command like this:

```
$ sudo ln -s /dev/ttyS0 /dev/modem
```

In this example, `/dev/modem` will point to the first serial port.

Ubuntu's `network-admin` (shown in Figure 2.14 and found under System, Administration, Networking) will always detect the presence of a modem on the system. However, it does not activate the interface unless specifically told to do so. You can use the Auto-Detect button to find the correct modem port.



FIGURE 2.14 Ubuntu's `network-admin` will help you set up an appropriate modem.

## Configuring WinModems for Laptops

Other issues regarding modems focus on Linux notebook users with laptops using *controllerless* modems. These modems use proprietary software to emulate a hardware modem and are commonly referred to as *WinModems* due to the software being available only on Windows. Despite the release of binary-only drivers to enable use of some of these modems, these devices remain the bane of Linux notebook and some desktop users.

You might find some support for Lucent (but not Lucent AMR), Motorola SM56-type, the IBM Mwave, and Conexant HSF (not HCF) controllers. At the time of this writing, there

was no support for any 3Com or U.S. Robotics controllerless modems. For links to drivers and more information, browse to the Linux WinModem web page at <http://www.linmodems.org>.

## Configuring Power Management in Ubuntu

*Advanced Configuration and Power Interface (ACPI)* enables workstations and servers to automatically turn off when instructed to shut down. Most often used by Linux mobile users, ACPI can help extend battery sessions through the use of intelligent storage-cell circuitry, CPU throttling (similar to, but not the same as safety thermal throttling incorporated by Intel in Pentium III and IV CPUs), and control of displays and hard drives.

Most PCs support ACPI via the BIOS and hardware. ACPI support is configured, enabled, and then incorporated in the Linux kernel.

ACPI information is constantly available through the `acpi` command, which looks like this:

```
$ acpi -V
  Battery 1: charged, 100%
  Thermal 1: ok, 47.0 degrees C
  AC Adapter 1: on-line
```

This example provides information such as battery charge status, percentage of charge, as well as current system temperature and status of the AC adapter.

Alternatively, you can use the GUI tool that Ubuntu provides, which can be found under the System, Preferences menu as the Power Management option (shown in Figure 2.15).

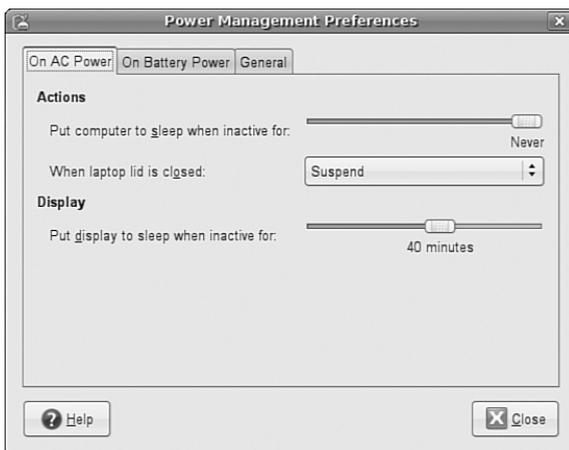


FIGURE 2.15 Gnome Power Management allows you to monitor battery status and configure specific power-related actions, such as closing the lid of your laptop or pressing the power button.

Fortunately, Ubuntu provides good support for suspend and hibernate. Suspend means that your computer writes its current state to memory and goes into a low power mode, while Hibernate writes the current state of the system to disk and powers off the computer. Either way, your computer will start much faster the next time you go to use it.

## Resetting the Date and Time

The Ubuntu installer queries during installation for default time zone settings, and whether your computer's hardware clock is set to *Greenwich mean time (GMT)*—more properly known as *UTC* or *coordinated universal time*.

Linux provides a system date and time; your computer hardware provides a hardware clock-based time. In many cases, it is possible for the two times to drift apart. Linux system time is based on the number of seconds elapsed since January 1, 1970. Your computer's hardware time depends on the type of clock chips installed on your PC's motherboard, and many motherboard chipsets are notoriously subject to drift.

Keeping accurate time is not only important on a single workstation, but also critically important in a network environment. Backups, scheduled downtimes, and other network-wide actions need to be accurately coordinated.

Ubuntu provides several date and time utilities you can use at the command line or during an X session, including these:

- `date`—Used to display, set, or adjust the system date and time from the command line
- `hwclock`—A root command to display, set, adjust, and synchronize hardware and system clocks
- `time-admin`—Ubuntu's graphical date, time, and network time configuration tool

### Using the `date` Command

Use the `date` command to display or set your Linux system time. This command requires you to use a specific sequence of numbers to represent the desired date and time. To see your Linux system's idea of the current date and time, use the `date` command like this:

```
$ sudo date
Wed Jan 10 14:17:01 EDT 2005
```

To adjust your system's time (say, to January 27, 2006 at 8 a.m.), use a command line with the month, day, hour, minute, and year, like so:

```
$ sudo date 012606002003
Fri Jan 27 08:00:00 EDT 2006
```

## Using the `hwclock` Command

Use the `hwclock` command to display or set your Linux system time, display or set your PC's hardware clock, or to synchronize the system and hardware times. To see your hardware date and time, use `hwclock` with its `--show` option like so:

```
$ sudo hwclock --show
Fri 27 Jan 2006 02:17:53 PM GMT -0.193809 seconds
```

Use `hwclock` with its `--set` and `--date` options to manually set the hardware clock like so:

```
$ sudo hwclock --set --date "01/27/06 08:00:00"
$ sudo hwclock --show
Tue 27 Jan 2006 08:00:08 AM GMT -0.151718 seconds
```

In these examples, the hardware clock has been set using `hwclock`, which is then used again to verify the new hardware date and time. You can also `hwclock` to set the Linux system date and time date using your hardware clock's values with the Linux system date and time.

For example, to set the system time from your PC's hardware clock, use the `--hctosys` option like so:

```
$ sudo hwclock --hctosys
```

To set your hardware clock using the system time, use the `--systohc` option like so:

```
$ sudo hwclock --systohc
```

## Changing the Time and Date

Ubuntu's graphical X tool named `time-admin` can be used to set your system date and time. The client is found in System, Administration, Time & Date.

After you press Enter, you are asked to enter your password. Type in your password and click the OK button. You will then see a window, as shown in Figure 2.16.

Set the date and time by using the Calendar and Time fields. You can also have your workstation obtain updated date and time information via the Internet by choosing Remote Time Servers under the Select Servers button. To do this, you need to have `ntpd` time daemon support installed. If it is not present, Ubuntu asks whether you want to retrieve it, and then installs it so that you can proceed. After it has been installed, restart the `time-admin` client and you will now be able to select specific Internet time servers for you to synchronize with.

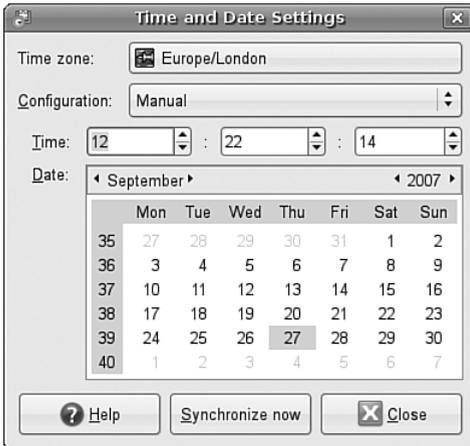


FIGURE 2.16 Use Ubuntu's `time-admin` client to set your system date and time.

## Configuring and Using CD, DVD, and CD-RW Drives

Linux provides support for using a variety of CD and DVD devices and media. This section shows how to determine what device has been assigned to your CD drive and how to get additional drive information if the drive supports recording on optical media.

AT Attachment Packet Interface, or ATAPI, IDE-based CD drives are recognized during installation and work through the `ide-cd` kernel module. A symbolic link named `/dev/cdrom` is created and the device is mounted under `/media/cdrom`, both of which point to your CD's device (perhaps `/dev/hdb` or `/dev/hdc`). You can use many different types of CD drives with Linux, and you can easily replace, add, or upgrade your system to use a new drive. Part of a successful configuration involves the proper installation of the hardware and being able to determine the drive's device when using Linux.

### Checking Drive Assignment

Linux recognizes CD and DVD drives upon booting if they are attached to your computer's motherboard with proper cabling and if they are assigned as either a master or slave on an IDE channel. Look through your kernel boot message for the drive device assignment, such as the following:

```
hdd: DVDROM 10X, ATAPI CD/DVD-ROM drive
```

If you have a DVD-capable drive, you generally should also have a symbolic link named `/dev/dvd` and an entry under `/media` that point to your drive's device because many DVD clients, such as `xine` or `vlc`, look for `/dev/dvd` by default. If you have a CD-RW drive, the Ubuntu installer inserts a kernel argument into your boot loader's configuration file that specifies use of the `ide-scsi` kernel, such as the following:

```
append="hdb=ide-scsi"
```

A similar entry in the grub boot loader's `/etc/grub.conf` file would look like this:

```
kernel boot/vmlinuz-6.5-1.358 ro root=/dev/hda2 hdb=ide-scsi
```

The first CD-RW drive is assigned to the device `/dev/scd0` (although it might still be initially recognized while booting as an IDE device), with subsequent drives assigned to `/dev/scd1`, and so on. To initialize your drive for use, the following modules should be loaded:

Module	Size	Used by	Not tainted
sg	30244	0	(autoclean)
sr_mod	15192	0	(autoclean)
cdrom	27872	0	(autoclean) [sr_mod]
ide-scsi	8128	0	
scsi_mod	96572	2	[sr_mod ide-scsi]

Look for kernel message output regarding the device such as this:

```
Attached scsi CD-ROM sr0 at scsi0, channel 0, id 0, lun 0
sr0: scsi3-mmc drive: 0x/32x writer cd/rw xa/form2 cdda tray
Uniform CD-ROM driver Revision: 3.12
```

Your ATAPI-based CD-RW drive will then work as a SCSI device under emulation, and the symbolic link `/dev/cdrom` should point to `/dev/scd0`. You can also use the `cdrecord` command (included with Ubuntu's multimedia software packages) to acquire SCSI device information about your drive for later use during the burning operation, as follows:

```
# cdrecord -scanbus
Cdrecord 1.10 (i686-pc-linux-gnu) Copyright (C) 1995-2001 Jörg Schilling
Linux sg driver version: 3.1.22
Using libscg version 'schily-0.5'
scsibus0:
    0,0,0  0) 'HL-DT-ST' 'RW/DVD GCC-4120B' '2.01' Removable CD-ROM
    0,1,0  1) *
    0,2,0  2) *
    0,3,0  3) *
    0,4,0  4) *
    0,5,0  5) *
    0,6,0  6) *
    0,7,0  7) *
```

The pertinent information—`0,0,0` in the example (SCSI bus, device ID, and logical unit number, or LUN)—can then be used during a burn operation like this:

```
# cdrecord -v speed=8 dev=0,0,0 -data -eject file_name.img
```

In this example, a CD-ROM data image named `file_name.img` is created on a CD-R or CD-RW media at a speed of 8, and the new disk will be ejected after the write operation has completed.

#### NOTE

Ubuntu also includes the `dvdrecord`, `dvd+rw-format`, and `growisofs` commands, which can be used with DVD-R and DVD-RW drives.

## Configuring Wireless Networks

Wireless networking used to be a pig to configure for Linux, requiring a lot of complicated steps to connect to a wireless network. However, Ubuntu includes a great utility called Network Manager that makes connecting to and managing wireless networks extremely easy. Thanks to the inclusion of several wireless chipset drivers in the Ubuntu Linux kernel, it is now easy to connect to WEP and WPA encrypted wireless networks.

When you log in to Ubuntu, you should see the Network Manager applet appear in the top panel (see Figure 2.17). This is the applet that handles and monitors network connections.

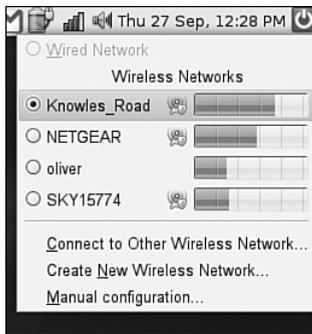


FIGURE 2.17 The Network Manager notification applet, seen here already connected to a wireless network.

Click the applet icon in the toolbar to connect to a wireless network. If your wireless access point broadcasts its SSID, it should appear in the list under wireless networks (similar to Figure 2.17). Simply click on the required network and Network Manager will detect what encryption (if any) is in use and ask you for the passkey. Enter this and Network Manager will start the wireless connection. The passkey is then stored in the default keyring, so if you have not yet used the keyring, you are asked to create a password. From now on, whenever you log in to Ubuntu, you are asked for the key to unlock the keyring.

If for some reason your wireless network does not appear (you might have your SSID hidden), you must use the Connect to Other Wireless Network option, which brings up the screen shown in Figure 2.18.



FIGURE 2.18 Configure your wireless network connection settings using Network Manager.

Network Manager can handle WEP and WPA Personal encryption. You are advised to use WPA encryption because it is the stronger of the two.

Network Manager can also connect to Cisco VPN connections, using the `vpnc` software. Install this using `synaptic` and you will be able to specify connection settings as appropriate, or if you have access to a predefined configuration (`.pcf` file) you can import it directly into Network Manager.

## Configuring Firestarter

Ubuntu is unique among distros in that as default it does not listen on any network ports. This means that it is pretty much secure. However, you may have a requirement to open up ports for access by other local computers.

To configure the firewall, you need to download and install the `firestarter` package using either `synaptic` or `apt-get`. When installed, you can use it to open specific ports or even allow access to specific computers. It's a handy application, and you can find more details at <http://www.fs-security.com>

### Related Ubuntu and Linux Commands

You will use these commands when performing post-installation configuration tasks:

- `acpi`—Views or uses power management settings and commands
- `cdrecord`—Gets SCSI device information and burns CD-ROMs
- `dmesg`—Views information reported by the Linux kernel

## Reference

- ▶ The Linux Keyboard and Console HOWTO—Andries Brouwer's tome on keyboard and console issues; includes many troubleshooting tips.
- ▶ <http://www.x.org/>—The X.Org Foundation, home of X11R7.
- ▶ <http://www.alsa-project.org/>—Home page for the Advanced Linux Sound Architecture project, an alternative set of sound drivers for Linux.
- ▶ <http://www.opensound.com/>—Commercial sound drivers for Linux.
- ▶ `/usr/src/linux-2.6/Documentation/power/pci.txt`—Patrick Mochel's document regarding PCI power-management routes for Linux kernel and PCI hardware support programmers.
- ▶ <http://tldp.org/HOWTO/Modem-HOWTO.html>—One of the newest HOWTOs on using modems with Linux.
- ▶ <http://tldp.org/HOWTO/Serial-HOWTO.html>—David S. Lawyer's Serial HOWTO, with additional information about Linux and serial port use.
- ▶ [http://www.camiresearch.com/Data\\_Com\\_Basics/RS232\\_standard.html](http://www.camiresearch.com/Data_Com_Basics/RS232_standard.html)—A description and tutorial on the EIA232 (formerly RS232) standard.
- ▶ <http://www.qbik.ch/usb/devices/>—The place to check for compatibility of USB devices for Linux.
- ▶ <http://www.linmodems.org/>—This site provides links to several drivers for controller-less modem use under Linux.
- ▶ <http://www.linux1394.org/>—Home page for the Linux IEEE 1394 project with new information, links to updated drivers, and lists of compatible chipsets and devices.
- ▶ <http://groups.google.com/>—Search Usenet groups through Google; another alternative to <http://marc.theaimsgroup.com/>.
- ▶ <http://www.linuxquestions.org/>—The Linux Questions site, a useful set of community forums that can help you find answers to your more frustrating problems.
- ▶ <http://cdrecord.berlios.de/>—Home page for the `cdrecord` command and related utilities.