chapter

3

Installation

For this book, I will be basing a great deal of the desktop on KDE version 3.2. (KDE 3.1 is very similar, too.) From the Linux installation perspective, this implies that you are planning to run a modern Linux distribution and not some disks you've had lying around for the last three years. An up-to-date release of your favorite distribution, whether it is Fedora, SUSE, Mandrake, or something else, is essential.

A modern Linux installation is easy. I will go so far as to say that it is even easier than installing Windows. For the most part, you boot from your CD-ROM drive, click Next a few times, and you are running Linux. Okay, perhaps there is a bit more to it than that, but not much. Linux will, for the most part, auto-detect nearly all devices on your machine and automatically configure them optimally.

Getting Ready for Your Installation

If your machine has Windows already installed and you have documents, spreadsheets, pictures, or music files that you wish to keep, now is a good time to back them up, either on diskette or burned to a CD-ROM. Even if you plan on preserving your Windows installation for a dual-boot system, it's always prudent to have a good backup if you are going to be doing major work on your hard disk. You might also want to take advantage of all that hard work that was done in pre-installing Windows and make notes on all the hardware in your machine—the type of network and video cards and anything else you can think of. You do that by clicking the Start button, selecting Settings>Control Panel, then double-clicking the System icon. Now, walk through the hardware profiles, and take some notes. Odds are you won't need it at all, but you can never have too much information.

The average Linux installation takes about 30 to 60 minutes, although I have seen it take as little as 5 minutes on a really fast system. That's a fully network-ready, configured, all-set-to-work machine with no rebooting every few minutes to load another driver. It doesn't get much easier than this.

That said, unless you are feeling particularly adventurous, I would highly recommend that you read through this chapter once before actually starting.

Hardware Considerations

Before moving on, let's talk hardware. The sad truth is that not every device will work with Linux. You should not think of this as being strange or as somehow representing a weakness in Linux. After all, Linux is not unique in this. In fact, Linux may be fairly unique when it comes to the sheer number of devices and platforms that it does support. Linux runs on Intel-based systems as well as Alpha, RISC, and Macintosh systems. IBM's entire line of computers, from small desktop PCs to such large mainframe systems as the S/390, run Linux. Then there are MIPS, SPARC, and StrongARM. You can also find Linux embedded in microchips, running on portable MP3 players, PDAs, cell phones, and even digital watches. That's incredible hardware support!

From the perspective of your computer, it is highly unlikely that Linux won't install and run well. If something is going to be unsupported, it will have to do with some Windows-only modems, printers, or scanners. To find out whether or not your computer and its associated devices will work with your Linux installation, first check your Linux vendor's web site. Another great hardware

resource is the Hardware HOWTO. You can always find the latest version by surfing on over to the LDP's Linux Hardware Compatibility HOWTO page at `www.tldp/HOWTO/Hardware-HOWTO`.

As Linux gains in popularity, you'll find that hardware vendors are increasingly interested in tapping into this ever-growing market. I remember being on site, adding hardware to a customer's system (Ethernet cards come immediately to mind) and finding that the system did not have the drivers. When I quickly visited the Ethernet card manufacturer's web site, I found precompiled drivers ready and waiting for me. With the incredible growth of Linux, it won't be long before these issues are a thing of the past.

Dual Booting Revisited

In the last chapter, I mentioned dual booting, a means by which you can run both Linux and Windows on one machine. At boot time, a menu lets you start one *or* the other. Pretend for a moment that you still want to run Windows from time to time. Perhaps you want the comfort of knowing that you can go back to your old operating system to do certain things. This is where dual booting comes into play. Please note, however, that dual booting requires a little more up-front work.

One dual-boot scenario involves a completely separate disk that you can dedicate to a Linux installation. Although this is an ideal situation, most people have a single disk with Windows already loaded. If you have a large disk, there is a good chance that it already has two partitions: the C: drive and the D: drive. Erase the D: drive, and use it for Linux instead. If you are going to follow this route, make sure you back up any documents or copy them into folders on your C: drive.

Unfortunately, Windows is just as likely to be taking up the entire partition table. The trick is to *shrink* the existing Windows partition, thereby creating some space on which to install Linux. To do this, you must defragment your disk in Windows before resizing your partitions. Click the Start button, and then select Programs>Accessories>System Tools>Disk Defragmenter.

Resizing the partition is your next step. Once again, there are two ways of doing this. Some recent distributions, such as Mandrake and SUSE, automatically detect a Windows-only disk and offer to shrink the partition for you. Alternatively, you can do this with a little DOS program called FIPS, which you can find on your Linux distribution CD. On Debian, check the tools directory. On Red Hat or SUSE, check the dosutils directory.

In most cases, there will probably be a directory called FIPS or FIPS20 with a number of files inside, including the FIPS.EXE program itself.

A Sample FIPS Session

> *Quick Tip* When doing anything this drastic with your drives, *always* make a backup. In fact, no matter what you do with your system, always make regular backups.

Say you've already run your defragmenter and you have plenty of space on your hard drive. Start by creating a DOS/Windows boot diskette. This is generally done by typing the following command from the DOS/Windows command prompt (after inserting a blank diskette into the diskette drive):

```
FORMAT A: /S
```

The /S tells DOS/Windows to transfer the system to the boot diskette. You will also want to have a second boot diskette handy, so do this a second time. You'll need it to back up your boot sector. I'll explain why in a moment. Next, copy the FIPS.EXE utility and its associated files from the CD-ROM drive to the first diskette:

```
COPY D:\DOSUTILS\FIPS20\*.* A:
```

Remember that the path to the FIPS20 directory may vary depending on your distribution CD. Now, shut down Windows, and boot from the FIPS diskette. When the boot completes, you should be at a DOS prompt. This is where the split occurs. Now, run the FIPS command:

```
FIPS
```

FIPS displays a partition table showing you how the disk space has been allocated and asks which partition you want to split. Because you have only one partition in this example, the answer is easy. Enter the partition number, and press <Enter>. As a precaution, FIPS will ask you whether you want to make a copy of your boot sector on the remote chance that disaster strikes. You probably want to answer Y (yes) to the question. This requires a second,

pre-formatted diskette. Put in your second diskette, and answer Y to the next question: Do you have a bootable floppy disk in drive A: as described in the documentation (y/n)? Because you just inserted the diskette, press <Enter>.

Now the fun begins. FIPS displays your partition table again. Using the Left and Right Arrow keys, change the size of the partition. You'll see the numbers changing each time you press the keys. When you are happy with your changes, press <Enter>. FIPS asks you to confirm the changes. You can still change your mind at this time. If everything looks good, press the <c> key to continue, then answer Y when asked if you are ready to write the new partition scheme to disk.

When FIPS completes, reboot your system. You might want to reboot into Windows first just to make sure that things are working properly. If everything looks as you want it to, pop in your Linux installation CD, shut down Windows, and reboot the system.

Windows XP Considerations Although the install tools included on the distribution CDs are very good at determining the presence of a Windows 95, 98, or ME partition and shrinking it for you, not every distribution can shrink a Windows XP NTFS partition. Of the distributions covered in this chapter, SUSE 9.0 and Mandrake 10.0 can both do the job. Fedora cannot.

What that means, unfortunately, is that FIPS and the magical tools included as part of the Linux install CD won't work here. Once again, there are two possibilities. One is to get your hands on a product called PartitionMagic (`www.partitionmagic.com`), an alternative to using FIPS. It's a nice, friendly, commercial package that enables you to modify partitions on the fly, including NTFS partitions, such as those found on Windows XP systems.

The second option is to back up your data, reformat your hard drive, and reinstall Windows XP from scratch, this time making sure that only half (or a third or a quarter) of your disk is allocated to Windows. Please be sure that you are completely comfortable with the idea of reinstalling XP before you proceed.

There is a third option, of course: Install Linux and forget about XP.

An Installation Comparison

Modern installations offer a nice, graphical process, and for the most part, installing Linux today is a point-and-click experience with help every step of the way. Of course, a graphical installation makes a lot of assumptions that might not necessarily be what you want. Should all else fail, try the text-based installation. Most distributions still provide one, and I don't see that changing anytime soon.

A Very Generic Install

Every installation is similar in many ways, though the order of the steps may vary slightly. After booting, you get a nice welcome screen usually followed by a request for the language you want to install in. Hot on the heels of this is some kind of basic peripheral selection, namely for your keyboard and mouse. You're also asked for your time zone. Somewhere near here, every installation asks you for options on partitioning and formatting your drive. For most users, the defaults are fine, and your Windows partition (if you opted for a dual-boot system) is detected and set aside. This is also the point where you are asked to select a boot loader and to confirm the operating systems you want to be able to launch at boot time. Once again, this is particularly important if you are setting up a dual-boot system.

After all of these preliminary steps, it is time to load your software. Some kind of default collection is offered (workstation, server, and so on), at which point your system starts to load. There may be one or more CDs to load, depending on how much you asked for. Once this is over, it is time to configure your network connection, followed by the graphical window setup, also known as the X window system.

That's when you get your first introduction to Linux security. The installer asks you for an administrative user (*root*) password and provides you with the opportunity to create one or more additional users for day-to-day use. Under normal circumstances, the root user should not be used except to install software or to update and administer your system in some fashion. The separation of administrative from *regular* users is one of the ways Linux protects your system from accidental or malicious damage.

Usually, that is pretty much it. The system reboots, and you're running Linux.

Note Installers tend to make fairly intelligent choices along the way. Nevertheless, you should still check to make sure that what is selected is indeed correct.

Another source of information is the distribution itself. Most Linux distribution CDs have extensive installation information on the CD, in the box (if you purchased it), or on the distribution's web site. If you are feeling less than adventurous, print out a copy before you begin your installation.

Remember that until you have actually formatted your drives, you can still change your mind about many of the decisions you make along the way. Just click the Back button or use the Tab key to move to it, and reenter the information the way you intended.

Of course, my generic install is just that: generic. To give you an idea of just what you can expect when you go through the real thing, I will walk you through *three different installations* using some of the more popular Linux distributions.

Note As of this writing, Mandrake 10.0 was just released, Fedora Core 1 was out with version 2 in test, and SUSE 9.1 was the also a new kid on the block. I mention this release information because the screens you see may not be precisely as I describe here—probably nothing major, but some things may be a bit different. That's why I want you to look at these install examples *as* examples. They are meant to prepare you for what you will experience during an installation.

Warning Almost any modern PC can boot from a CD-ROM, and this is the easiest way to install. If your system cannot boot from the CD, you can create a boot diskette. If this is a problem for you, put your first Linux CD into the drive and use Windows Explorer (the file manager) to look for a directory called boot on the CD. There will be a boot disk image there (the name may vary) and instructions on how to create the diskette.

A Mandrake Linux Install

For this Mandrake install, I used version 10.0.

Reboot your system with the installation CD in the drive. Mandrake boots with a graphical screen with two options. Pressing <F1> enables you to choose between text and low-resolution install modes; the default is the standard graphical install. Press <Enter> and you are on your way.

Basic hardware detection takes place at this time, and the installer is loaded into memory. In a few seconds, you'll be at the main install screen. On the left side of the screen, there's a set of steps, each with a light beside the label to let you know roughly where you are in the installation process. The first of these steps involves selecting your preferred language for installation; there are many, and they are organized by continent to help you narrow things down. Select your language of choice, or click OK to accept the English (American) default and continue. On the next screen, read the license agreement to learn about the GPL and related licenses, click the Accept radio button, then click Next.

The next screen deals with security. Mandrake's default install lets you choose among four security levels. What each level allows or denies is documented on the page. Take a moment to read it, and choose the level that works for you. Most people choose the default of Standard.

Mandrake's install then automatically detects your hard drive, which means it is time to set up your file systems. The options here involve erasing the entire disk, doing your own custom disk partitioning, or using the free space on the Windows partition. This is quite *interesting*, because it enables you to automatically resize the Windows partition, making use of the free space in order to install Mandrake. Remember, the only caveat is that the Windows disk must be defragmented first.

The default option is Use Free Space, and that is probably what you should choose. Click OK to continue. The partitions are created and formatted, and a list of available packages is pulled from the install disk. Now, it is time to decide what kind of a system you want. You will be looking at the Package Group Selection screen. A standard Mandrake install is a Workstation install, and that's where the emphasis is placed with the defaults. Office Workstation is automatically selected, as is Internet Station. That means you get your word processors and spreadsheets, as well as email clients and web browsers. If you want to play games and music, you should click on Game Station and Multimedia Station.

Once again, if you want to be able to compile programs—those bleeding-edge new programs—you should also click on Development. In addition,

I recommend Configuration and Console Tools to help with system configuration. Network Computer (client) provides the SSH client. In an office situation, you will most certainly want that as well.

Before you move on, look over on the right. If this computer will be a server, you may wish to add web, FTP, email, and database servers. Pause your mouse pointer over the choices to see a tool tip containing a short description of what each server offers. Finally, look under Graphical Environment where the KDE environment is selected by default. You may, however, want to choose GNOME here as well. Furthermore, if you would like to experiment with even more desktop environments at some future time, consider checking on Other Graphical Desktops. This loads WindowMaker, IceWM, and others. At the bottom of the screen, there's a check box labeled Individual Package Selection, which enables you review your choices and add or remove items as you see fit.

Click Next, and the package installation begins. You'll be treated to a little slide show telling you about Open Source software, Mandrake products, joining the Mandrake Club, and information about the various things that come with your Mandrake system. In short, the show tells you why you are going to love working with Mandrake Linux. Depending on the choices you made, you may need to switch the CD at some point.

When the installation completes, you are asked to choose a root password, after which you have the opportunity to create one or more normal users. You need to create only one at this time. Notice that the Mandrake install lets you choose a representative icon for your users. Just click on the icon, and select one that suits you. I particularly like the cat myself. After entering your information, click Accept User, then click Next (unless you are adding multiple users, of course).

Mandrake then asks you to choose your default Window manager. KDE is displayed as the default, and that will do nicely. You can also choose to have the system automatically log in a single user on boot. Although this is fine for a home user who is the only user on the system, I highly recommend that others, particularly those in office environments, make sure this check box is off.

Click Next to continue and view a summary screen of various hardware options, such as printer, sound card, network, and so on. Some of these will be configured already, but others may need to be set up (the Network/LAN option, for instance). Click the Configure button to make changes. In most cases, a wizard will take you through the various choices available. The installer is very good at autodetection of printers, network connections, and graphical interfaces, so if you aren't sure, take the defaults. When you are happy with all your choices, click Next.
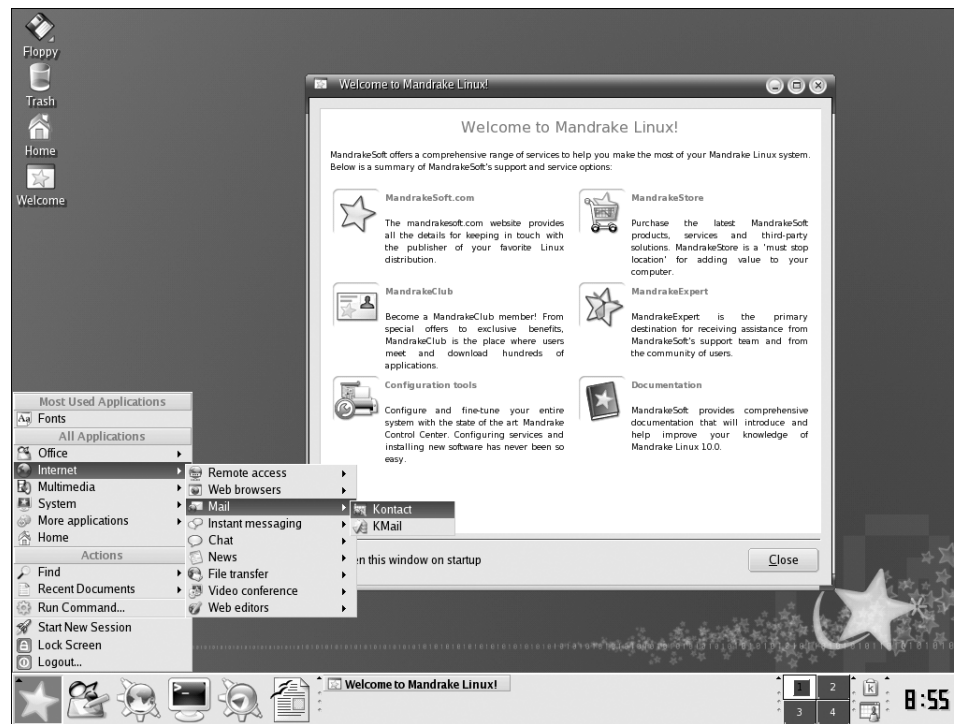
the time you read this book. In terms of installation, there were virtually no differences at all between Red Hat 9.0, Fedora Core 1, and Fedora Core 2.

Start by putting in the CD-ROM and rebooting your system. The boot menu appears, giving you the option of choosing either a graphical or text install. For almost every system out there, the graphical install is just fine. All you need to do is click or press Install, and the system will start booting. The system identifies devices, and you see a number of messages scroll by.

A few seconds later, you'll see an interesting message. Fedora's install has a Media Check option. Here's the idea: You have your installation CDs, but you don't know for sure whether the disk is free from surface defects that will make installation impossible. Isn't it better to find out before you start all the work? The choice is yours. You can choose to test each CD in your set before you proceed, or you can simply skip the step.

After the media check, the graphical install screen appears. This is just a wel-come screen; click Next to continue on. On the following screen, select the language you would like to use for the installation. I selected English and clicked Next again. The keyboard selection screen follows. Once again, I selected the default of U.S. English and clicked Next, which brought up the mouse selection screen.

On the mouse selection screen, the installer does an autodetect and makes a selection. Make sure that the mouse selected is more or less what you have. Notice the Emulate 3 Buttons option at the bottom of the screen. Unless you already have a three-button mouse, select this, because the Linux graphical X window system makes use of all three buttons. Clicking the left and right but-ton simultaneously is the same as clicking the middle button on a three-button mouse. Hot on the heels of mouse selection, it's time for the monitor configu-ration, another screen where you can pretty much just accept the default unless, of course, you can tell that the autodetection is way off from what you own.

The next screen is for installation type. The default option is Personal Desktop, which Fedora suggests is "perfect for personal computers or laptops." Most people will want to accept the default and click Next.

On the next screen, you can accept the default, which is to allow the install to automatically partition your disk. After clicking Next, you get some choices on Automatic Partitioning, which is to decide how the installer will make use of the available space. The default is Remove All Linux Partitions on This System, and this is probably the right choice. If you want to double check the decisions made by the installer, make sure that you check off the option Review (and Modify if Needed) the Partitions Created.

A warning box appears, letting you know that all data will be erased. Click OK. Depending on the size of your hard drive, you may get a warning, such as

"Boot partition/boot may not meet booting constraints for your architecture. Creation of a boot disk is highly encouraged." I'll talk about a boot disk later.

The Boot Loader Configuration is next. Red Hat installs the GRUB boot loader by default, but you can change it to LILO. Both work very well, and in the end, it is your choice. I have grown to like GRUB quite a bit, but I still use LILO on other systems without a care. At this point, you also have the option of setting a password on the boot loader. Home users don't have to worry about this, but some network installations may want the additional security of having to enter a password when the system is booted. Before you move on, you may want to have a look at the labels the installer assigns. I mention this because if you are setting up a dual-boot system, it will be identified as DOS. When you are happy with your choices, click Next.

The following screen is for network configuration. If you do not have a network card installed, you can skip to the next step. If your Internet connection is through a DSL or cable modem connection, that will likely be the case. The default is to boot and pull an address via DHCP, and this is what you would choose. If your PC is on a home or corporate network with fixed addresses, click Edit, check off Configure Using DHCP, and enter your address information. If you are in an office, check with your systems administrator for this information. Otherwise, enter your IP address and netmask, then click OK. Enter your hostname, gateway, and DNS information, then click Next.

The next section, the Firewall Configuration screen, is very important. There are many options here, and you should take the time to read what each one offers. Network security is extremely important, because the incidence of cyber-attacks continues to rise all the time. Linux PCs aren't as susceptible to viruses, particularly if you don't run as the root or administrative user, but that doesn't mean you should let your guard down. If you are a single user on a home PC that is connected to the Internet, choose Enable Firewall, leave the various services checked off, and click Next.

What follows is yet another language selection screen: Additional Language Support. That's because the OS can support multiple languages, and you can change that default at a later time. Unless you have another language at your disposal, leave the choice as it is and click Next. On the next screen, you will be asked to enter your time zone (in my case, America/Montreal). When you are done, click Next.

When you arrive at the next screen, you will get your first taste of Linux's multiuser nature with the Account Configuration. This is where you set your root password (root is the administrator login). After the installation completes,

you have the opportunity to create other nonroot (regular user) accounts. It's early, but I'll stress it now: You should create at least one nonroot account from which to work on a day-to-day basis.

This brings you to the screen with the goodies: Package Selection. The packages selected for the Personal Desktop are:

- Desktop shell (GNOME)
- Office Suite (OpenOffice)
- Web browser (Mozilla)
- Email (Evolution)
- Instant messaging
- Sound and video applications
- Games

Because I will be concentrating on KDE as the desktop, click Customize the Set of Packages to Be Installed. Click Next, and you will be on the Package Group Selection screen. You'll notice that packages are ordered into categories such as Desktops, Applications, and so on. Check off the KDE Desktop Environment under Desktops. Then, click Details and make sure that *all* KDE packages have been selected before you click OK.

> *Note* For the most part, you can leave everything else as is, but there is one other thing you may want to consider here. Despite the fact that most *desktop users* will not want to compile packages, I think that the lure of trying out something that is leading-edge or unusual will be more than even home users will be able to resist as they get familiar with their systems. That's why you might want to choose to install such development tools as gcc, perl, python, and more, as well as X Software Development, GNOME Software Development, and KDE Software Development.

When you're done here, click Next. This is the last step before the installation takes off on its own. You receive a final opportunity to change your mind before committing to this installation. Click Next, and a pop up window informs you of which other CDs you will need. For mine, I needed CD 1 and CD 2. Click Continue, and you are on your way.
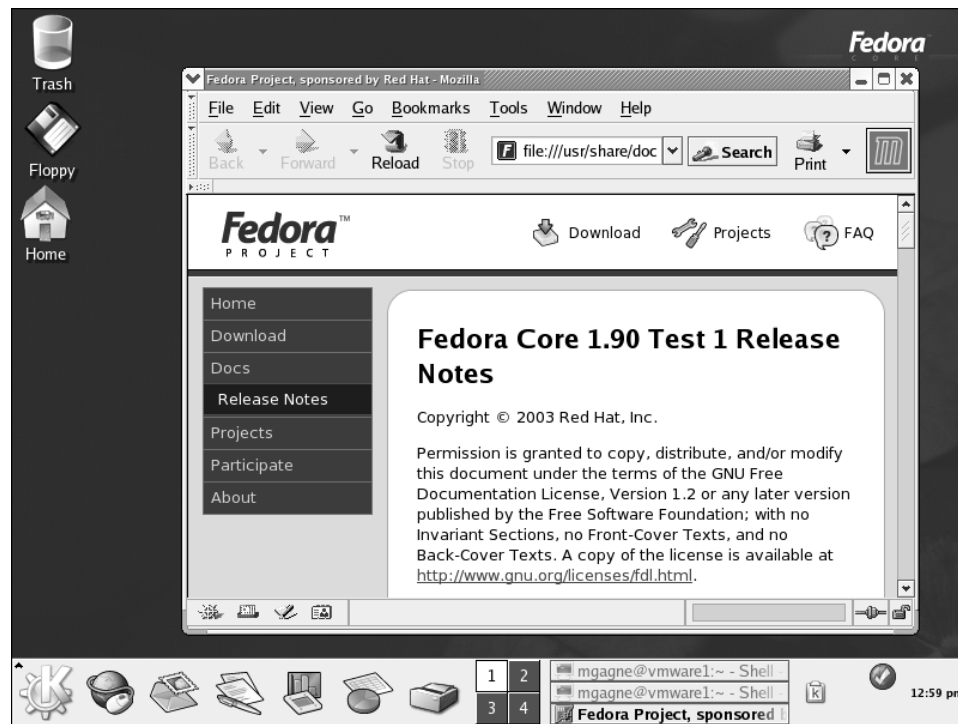
FIGURE 3-2   Fedora Core 2 (beta) desktop.

As your partitions are formatted, a progress bar keeps track of where you are in the installation. As the installation progresses, you are treated to some information about the Fedora project and some of the included products. Incidentally, this is usually a good time to take a break and grab something to drink. From time to time, you'll need to change CDs; you may need all three. When the installation completes, you have the opportunity to create an emergency boot diskette. Follow the instructions to do so, and label the diskette "Linux emergency boot diskette."

> *Note* Make sure you take out the CD-ROM before the system reboots.

When the diskette creation is done, click Next. The system reboots to a graphical Welcome screen. From here, you go through a few final configuration details. Accept the license agreement and click Next (Figure 3-2). If the

date and time are incorrect, you can adjust them here. On the next screen, you'll have an opportunity to fine-tune the display based on your monitor type and the number of colors you want displayed.

Click Next, and come to one of the more important parts of the process: user account creation. You must create at least one nonroot user for the system, and this is the time to do so. After clicking Next, the system lets you test your sound card and install additional CDs if you have them, after which you are done. The graphical login manager starts up, and you can log in as your nonroot user.

A SUSE Install

For my SUSE install, I used exactly the same machine and started from the same place. I used SUSE 9.0, which comes with both multiple CDs and a single DVD. The advantage of the DVD is that you do not have to swap disks.

Reboot your system with the CD or DVD in the drive. You now have the option of selecting various install modes. For a fresh installation, simply press <Enter> or wait, and the system will begin the installation.

The next screen you see after this is the Welcome screen, which is also where you select a language. The default is English, but you can certainly choose something else. Click Accept, and the install process begins analyzing your system for peripherals. All of these choices are shown to you on a single page; the keyboard, mouse, partitioning, software install, booting, and time zone information are all there on one screen. Notice the blue underline on each setting, much like on a web page. Check the suggested settings to make sure that things look right. If you need to change something, click the blue link. For instance, to change your time zone from the default of US/Pacific, click Time Zone, select from the list, and click Accept.

Be sure to look at Partitioning and Software. If you do have a Windows partition, you should see it listed as /windows/C. This is its mount point, unless you would like a different name. The software choices are the KDE Desktop Environment, Office Applications (this is OpenOffice.org), Help & Support Documentation, and Graphical Base System (the X window system).

Again, the lure of playing with some leading-edge software might be overwhelming at some point. You can prepare for that here by clicking on the blue Software link. On the screen that follows, click the Detailed Selection button. On the left side of the next screen, you'll see a number of categories for additional software. If you do want to compile your own programs, select C/C++ Compiler and Tools. I'm also pretty sure you'll want the Games and Multimedia packages. If I am right, choose those as well.

Finally, there's the GNOME desktop environment. Even though I am concentrating this book on KDE, it is a good thing to experiment with another desktop environment. In the end, you might like GNOME better than KDE. In the Linux world, you have a choice. Furthermore, it doesn't hurt anything to load it at the same time; you just use up some disk space. When you are done, click Accept to go back to your Installation Settings screen. Have a final look, and click Accept. You'll be given a final warning regarding installation. If you are ready to start, click Yes, Install.

Your drive will be formatted, your Linux system will load, and you'll see a progress bar at the top right. After a little while, the basic installation completes, and you see a message to that effect. Remove the CD, and press <Enter>.

This is where the SUSE installation is different. If you are installing from CD, you are asked for additional CDs to complete the package installation. If, on the other hand, you were using the DVD to install, you immediately jump to final configuration. The first of these steps is account creation, starting with the setting of the root password. The root account is used for such administrative functions as installing software. You do not want to run as root under normal circumstances, because root is essentially *all-powerful*.

After selecting a root password, click Next and create at least one user login. The SUSE install is interesting here in that it allows you to redirect all of root's mail directly to a user account. Check off the box that says Receive System Mail when you are creating your personal user ID. There's also a check box for Auto Login, which logs in this particular user without a password automatically at boot time. This is probably fine if you are running this system at home and are the only user, but in an office environment or with multiple users, you don't want to check this box. You can choose to create additional users at this time, or simply click Next to continue.

After a brief interlude describing some of the changes in SUSE 9.0, you get to the X window graphical configuration to lock in your video settings. The dialog here may vary depending on what kind of video hardware you have or whether your card is 3D accelerated. Just *make sure* that you test out the final settings before moving on. Even if the information looks right, click the Change button for an opportunity to test your settings. Video settings work perfectly 99.99% of the time. It's just good to be sure beforehand. When you are done here, click Accept.

The SUSE installer writes these settings to disk, then does some final hardware settings, starting with your printer configuration. Make sure that your printer is plugged in and turned on, then click Yes when asked whether you want YaST (the SUSE system administration tool) to detect your printer.

FIGURE 3-3   SUSE 9.0 desktop.

After a few seconds, YaST returns you to the Installation Settings screen for your connected peripherals and hardware. This includes Ethernet cards, printers, modems, sound cards, and so on. Make sure that things are as you expect them to be and change them if necessary. For instance, if your network card is connected to a cable modem, the DHCP settings are probably exactly as you want them to be. If you are on an existing network, however, you will probably want to change your interface to reflect your network's addressing scheme.

When you are happy with the changes, click Next. YaST finishes writing all of these settings to disk and finishes bringing the system up. Seconds later, you'll be at your login screen and ready to go. For a sneak peek at a SUSE Linux desktop, check out Figure 3-3.

Not So Tough Installs

As you can see, installing Linux isn't difficult, but it does vary from distribution to distribution. The thing to remember is that every distribution has similar

steps such as language, keyboard, and mouse selection. All distributors ask you about dealing with disk partitions and offer to do it for you if you would rather keep it simple. For the most part, it's just a matter of accepting the defaults and clicking Next.

Starting and Stopping Linux

This sounds like such a simple thing that you might wonder why I am spending any time on it at all. After all, you turn on the power switch, sit back, and watch Linux come to life. Depending on the installation, you may have more than one boot option. The default will almost certainly be to take you into Linux. If you opted for a dual-boot system, you may have to select Linux from the boot menu.

The lesson here is simply this: Because you do have options, take the time to read what's on the menu and go with that.

> *Warning* Here is *rule number one* when it comes to shutting down your system: Never, ever simply power off the system. You must do a *proper* shutdown. Oh, and get an uninterruptible power supply (UPS) so that your system doesn't shut down accidentally. I should perhaps make it clear that you do not *need* a UPS to run Linux. If you don't want a random power fluctuation or a three-second power outage to take down your system, however, the added protection of a UPS makes sense.

Linux is a multiuser, multiprocessing operating system. Even when it appears that nothing is happening, there can be a great deal going on. Your system is maintaining disk space, memory, and files. All this time, it is busy making notes on what is happening in terms of security, email, errors, and so on. There may be open files or jobs running. A sudden stop as a result of pulling the plug can damage your file systems. A proper shutdown is essential. Even in the world of your old OS, you still had to do a proper shutdown. That doesn't change for Linux.

There are a few ways of shutting down your system. You start by logging off from your system. Make sure that you've closed all of your applications and saved anything you might have been working on. Now, right-click on the desktop, and select Logout from the pop-up menu. You should see something similar to Figure 3-4.
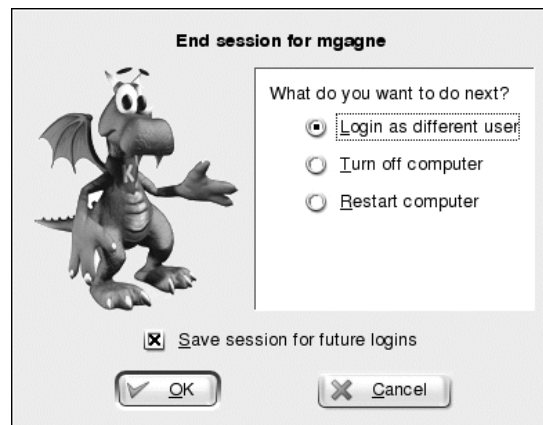
FIGURE 3-4   Available options when preparing to
end a login session.

This particular logoff screen is from a SUSE system, but the types of options
are similar regardless of which system you're on. At this point, select Turn Off
Computer. There's rarely any need for choosing Restart Computer in the Linux
world. When you shut down, it's usually because you intend to power off the
system.

Shell Out You can also log out from the command line, but it
must be done from the root login. From a terminal window, switch
to root with:

```
su - root
```

When you are prompted for the password, type:

```
shutdown -h now
```

When you call shutdown with the -h option, it is another way of
saying, "Shut the system down and keep it down." On some systems
and with proper hardware, this option powers off the system after it
is down. Another choice is to type:

```
shutdown -r now
```

The -r option tells Linux to reboot immediately after a shutdown.
A reboot option is usually used after a kernel rebuild.

And Now…Linux!

Congratulations! You have installed your Linux system, as well as learned how to bring it up and shut it down properly. Now you are ready to get to know your Linux system intimately, and as you turn to the next chapter, the fun really begins.

    To paraphrase a line from *Casablanca*, one of my favorite movies, this will be the beginning of a beautiful friendship.

Resources

FIPS
www.igd.fhg.de/~aschaefe/fips/fips.html

Mandrake
www.mandrakelinux.com

PowerQuest (for Partition Magic)
www.partitionmagic.com

Fedora Linux
fedora.redhat.com

SUSE Linux
www.suse.com