5
Using X Windows

In this chapter, we will explore the wonderful world of X Windows. X is more than just a pretty face—it is a portal through which you use Linux. You are about to discover the absolute magic of X. No other operating system offers such GUI potential.

Most Linux distributions come with a complete implementation of X known as XFree86, a freely distributable version of X. Some distributions are also shipping KDE (K Desktop Environment). Two notable distributions, Red Hat and SuSE, include the GNOME environment in their package.

X can be a nightmare or a dream come true. A nightmare, you ask? Well, you have to understand that X is infinitely configurable. Many options and many window managers are available to choose from, making it difficult to stay satisfied.

Besides networking, X is one Linux tool that must be configured correctly to be usable. Watch out, though; after you get it working and learn the power of X, you will be hooked forever!

We assume that you have installed the XFree86 window system on your Linux system. This chapter discusses the use of X under Linux. Some of the topics we cover are navigation, window managers, and specific applications.

Overview of the Graphical Environment

Figure 5.1 is a snapshot of a KDE 1.1 desktop running under SuSE 6.1 Linux. You will find KDE to be a very powerful graphical environment. KDE is shipped with other distributions as well, such as Red Hat, Slackware, and Caldera.

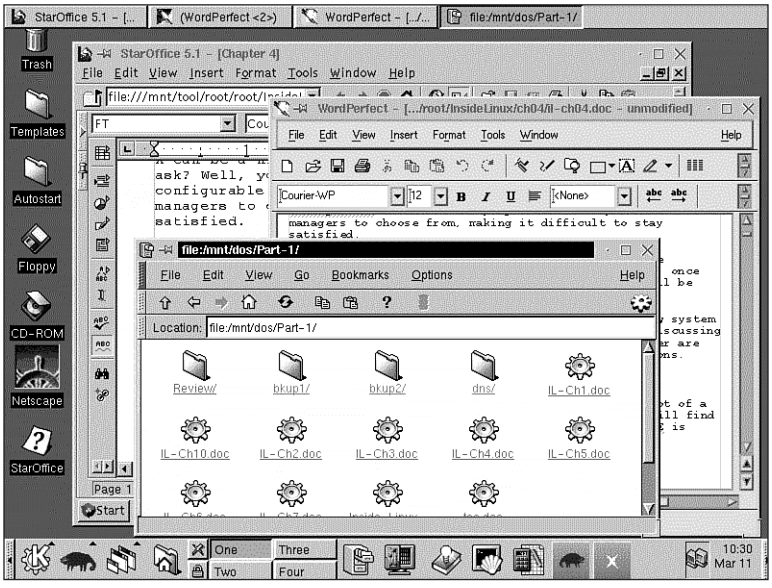

Figure 5.1 KDE 1.1 snapshot under SuSE 6.1 Linux.

If you are familiar with GUI environments on other operating systems, the screen should look familiar. On the left side of the desktop, there are icons. The first one is the Trash icon—as you delete files, they are deposited here. Just be sure to use the Move to Trash command. You can recover deleted files from the trash. The Templates folder icon contains skeleton files that can be used to create a new file of a specific type. For example, a URL template can hold a URL address. The Autostart folder icon is used to automate the execution of applications when the desktop starts up. It goes beyond that, too; if you have a document in Autostart, the associated application will start up and open the document. If a directory is stored in Autostart, it will be opened up. Be careful, though; any documents and applications in the directory will be started, too!

The Desktop

The portion of the screen that is occupied by applications is the desktop. Icons that represent files or programs also can be laid on the deskop. In Figure 5.1, three programs are running on the desktop: two popular word processing programs and the KFM file manager. KFM is one of many file managers that you can execute and use for file management under KDE.

The Taskbar

At the top of the screen in Figure 5.1 is a horizontal bar called the taskbar. When you execute an application, a button representing the application appears. You will notice that the taskbar has four buttons. The fourth button, `file:/dos/Part-1/`, is depressed, meaning that the application (KFM) has focus. KFM's title bar is blue in color and its window is in the foreground. Compare KFM's window to the other two windows: The other windows are obscured by KFM, and their title bars are gray. To make an application current (in focus), you can either click the window or you can click the window's button in the taskbar.

The Panel

The horizontal bar at the bottom of the screen is known as the *panel*. The panel serves a number of purposes. First, it houses various icons that can represent files, programs, or menus. You can add new icons to the panel or remove existing icons. You can add new items or remove existing items from any of the menus that reside on the panel. Second, you can control the window session from the panel, such as performing a log out or locking the screen. Take a close look at the panel, just left of center in Figure 5.1. You will see four buttons labeled One, Two, Three, and Four. These correspond to the four (independent) virtual screens. You do not see this functionality with some operating systems' GUI environments. The intent of virtual desktop is to reduce screen clutter. Here's how it works: You click One and start an application. Next, you click Two and start your second application on that screen. You can continue this process as you see fit. You can have up to eight virtual desktops to organize your running applications. Each virtual desktop is independent of the others.

Navigating X

As with any other graphical environment, X allows input from the keyboard and the pointing device. Most people use a mouse as their pointing device, but other devices can be used, such as a light pen or trackball (among other types). The mouse (or other pointer) is the optimal navigation tool. You can use the keyboard, but navigation is easier with a mouse.

You engage the environment by moving the mouse, pointing at some widget, and clicking. For example, if you need to make a window current, move the pointer onto the window and click. This is not the case with all X Window managers. With some window managers, merely moving the mouse over a window makes it current.

The Main Menu

Menu navigation is fairly intuitive with X. Most objects have an associated pop-up menu by means of the right mouse button. If you right-click the desktop, a pop-up (floating) menu appears. On the panel in KDE, the far left button, when clicked, will expose the main menu. Other menus pull up from icons on the panel. Figure 5.2 shows the KDE desktop with the main menu exposed.

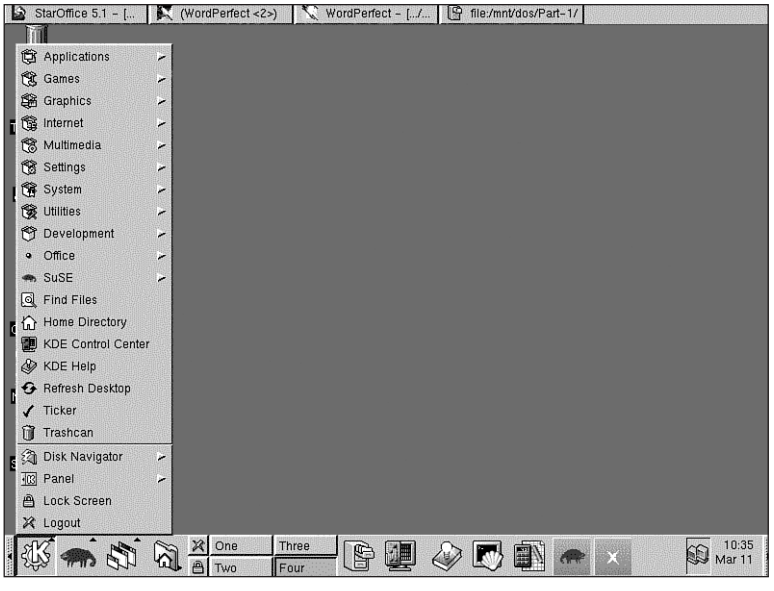

Figure 5.2 KDE desktop with the main menu exposed.

A wealth of applications and utility programs are contained in this menu. So much, in fact, that you might get dizzy. Of course, the quantity depends on the packages (or disk sets) you chose during installation. With some operating systems' system menus, the logical categorization of applications is by application name. On the KDE desktop, applications are categorized by functionality. This functionality can be very beneficial for a beginner (or an intermediate) Linux user. This allows the user to search for an application that can fulfill the task at hand.

The Menus Do Not Show Everything!

Many more programs and script commands are available than those shown on the menus. Most of the ones shown on menus are utilities and programs used by system administrators, software developers, and advanced users. Most of these applications use a command-line interface.

Experimentation is your best teacher, as well as this book. Peruse the various levels of menus; see what is available to you. If you find an application you are unsure of, use the Help system. Better yet, launch the program and see what happens!

Before we get too deep into the use of KDE, we need to discuss some X basics. After all, KDE is only one graphical environment you can use.

Window Managers

I have used the term *window manager* without actually defining it. Contrary to what some people might say, the X Windows system does not define a window manager. The window manager sits between the X Windows system and the user. The display of windows (size/position), scrollbars, and other window decorations are controlled by the window manager. You have complete control over the look and feel of your X environment. The reason we have so many window managers is because of the individualistic mentality of most Linux users. Be happy that you have a choice.

Choosing a window manager can be difficult. If you are not well-informed, choosing the wrong window manager can result in an unpleasant interface. A lean-and-mean window manager for a Linux power user would be inadequate for a Linux beginner. At the same time, a window manager that is infinitely configurable may be overwhelming for a beginner. You have to find a window manager with the right balance for your needs. Let's examine a few window managers and how they might be useful. Some of the window managers we will discuss are AfterStep, CDE, Enlightenment, fvwm, fvwm95, GNOME, KDE, olwm, olvwm, and twm.

AfterStep

AfterStep is a window manager that is modeled after the NEXTSTEP environment. The original intent of AfterStep was to mimic NEXTSTEP's look and feel, but it has diverged over time. The two primary goals of the AfterStep developers are stability and a minimal drain on memory.

Common Desktop Environment (CDE)

The Common Desktop Environment is a commercial GUI environment. It is considered to be a standard environment to be used under many flavors of UNIX. Hewlett-Packard, IBM, and Sun Microsystems (among others) are jointly involved in the design and implementation of CDE. Appropriately enough, CDE is available on UNIX systems, such as HP-UX, AIX, and Sun Solaris (among others). CDE is also available for Linux.

Enlightenment

Enlightenment is fast, stable, and intensely configurable. It offers 100-percent compliance to the GNOME environment. What is unique about Enlightenment is that you can create peculiar window shapes. Users are able to define the smallest of window details.

Because Enlightenment is still in the development stage, it can exhibit erratic behavior. If you consider the possibilities, however, it might be worth the effort to get Enlightenment up and running. Red Hat utilizes Enlightenment to support GNOME, Red Hat's default environment. A bit of trivia: The author of Enlightenment (Rastermann) used to work for Red Hat.

fvwm

The fvwm window manager is derived from and improves on twm. Robert Nation developed fvwm, which was considered to be *the* window manager to use. Other window managers have followed in fvwm's footsteps, such as fvwm2 and fvwm95. fvwm provides a virtual desktop, supplying multiple desktops to the user. Each desktop can be larger than the physical screen—you use the mouse to "move" the current desktop behind the screen. Think of the desktop as a wall mural and your screen as a picture frame. The picture frame acts as a portal into the mural. You use the mouse to move the mural about the frame, bringing windows into view.

The fvwm window manager also introduces the sticky window concept. This allows you to anchor a window to a specific coordinate on the physical screen. As you scroll around on the desktop, any sticky windows stay put.

fvwm95

The fvwm95 window manager is based on fvwm2 (which is based on fvwm). Much of the functionality of fvwm2 is retained; the majority of the changes involve the look and feel. The fvwm95 window manager is an attempt to emulate the graphical environment of a popular operating system (which will remain nameless). Enough said.

GNOME

GNOME stands for GNU Network Object Model Environment. The goal is to provide a freely distributable, user-friendly desktop. Because GNOME is not a complete window manager, it will require one, such as Enlightenment. Red Hat uses GNOME as the default graphical environment and utilizes Enlightenment as the base window manager.

If you are using GNOME and decide to change window managers, be sure it is GNOME aware. GTK+ is the GUI toolkit used for GNOME applications, providing a consistent look and feel. Also unique to GNOME applications is the utilization of CORBA (Common Object Resource Broker Architecture). This allows GNOME components (applications) seamless interoperability, regardless of the machine on which they are executing. CORBA also allows applications written in different languages to seamlessly communicate.

KDE

The intent of the K Desktop Environment is similar to GNOME's—to provide a desktop environment with a consistent look and feel across applications. KDE is also similar to GNOME in that it requires a window manager. Applications packaged in KDE include a file manager, an integrated help system, a window manager, and a configuration utility for the display.

LessTif

LessTif is a clone of OSF/Motif. It consists of a window manager, a widget set, and UIL implementation.

olwm

The olwm window manager is derived from the Open Look Window Manager from Sun's Open Windows graphical interface.

olvwm

The olvwm window manager is equivalent to olwm with the addition of a virtual desktop. This desktop is larger than the physical screen. The olvwm also supports XPM pixmaps and GIF images, displayed as icons and for menu type images.

twm

The classic window manager from MIT, which features shaped windows and title bars, icon management, macro functions, and much more.

Exploring the Graphical Environment

We begin our GUI travels with KDE, a popular graphical environment that is included with a few distributions. You have already seen some examples in this chapter. This section shows you some of the basic utilities, such as system navigation, dial-up connectivity, and desktop customization, to name a few. By the way, KDE recently won "Innovation of the Year" at the CeBIT'99 conference. The next section follows up with an overview of GNOME.

KDE

You can start KDE from the command line or have the system start it up automatically, after boot up. To start up the KDE environment, you use the `startx` command. This assumes, of course, that KDE is the default window manager. The syntax is as follows:

```
startx  [ [client] options] [ -- [server] options
```

The `startx` command is normally a shell script that is used to start up the X Window system. In a pinch, you can do the following to start up KDE:

```
stimpy $ startx
stimpy $
```

Some systems are set so that you can start KDE with the `kde` command, as in the following:

```
stimpy $ kde &
stimpy $
```

The rule of thumb is to execute the `startx` command. Figure 5.3 shows KDE after it has initialized.

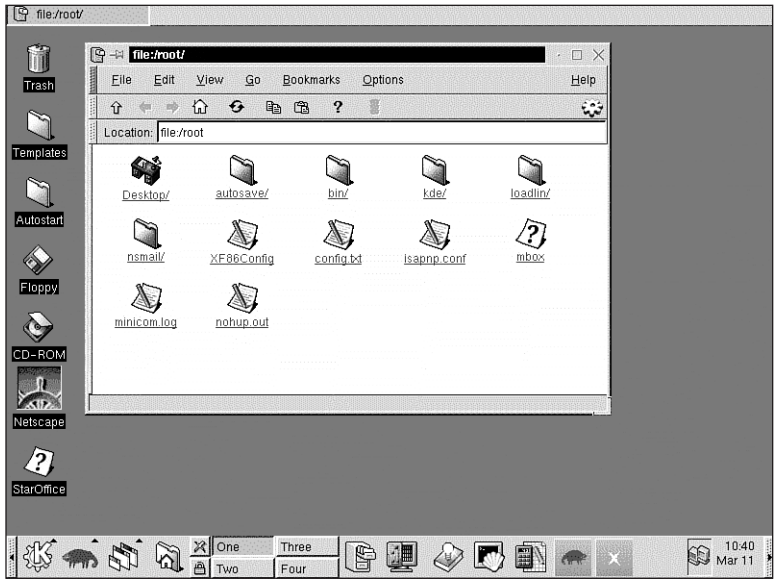

Figure 5.3 The KDE environment after startup.

The horizontal bar spanning the top of the screen is the taskbar. The panel is the horizontal bar that spans the bottom of the screen. The desktop, basically, is everything else on the screen. The desktop is where you arrange your running programs and icons. The following sections provide a quick review of these three areas.

KDE Taskbar

When you execute an application, a button representing the application appears. The button's text displays the name of the application. You can scan the taskbar to see any applications that are running. You can also click an application's button to make it current. This is a quick way to switch to another running program. Figure 5.3 shows that kfm, the KDE file manager, is the sole application running on the desktop and is represented in the taskbar.

As applications are launched, the taskbar begins to fill with buttons. If you continue to launch applications and the taskbar fills, the buttons will be resized (shrunk) to accommodate new buttons.

KDE Panel

The KDE panel provides a number of services. First, it houses various icons that represent files, programs, or menus. You can add and remove icons and menus from the KDE panel. The KDE panel is a convenient repository to hold your frequently used commands. This provides you with a central point from which to execute your favorite commands.

The KDE panel is also home to the virtual desktop panel. The default location is on the left side of the KDE panel. The KDE panel defaults the number of virtual desktops to four. You can have up to eight virtual desktops represented on the panel, configurable through the KDE control center. We discuss virtual desktops in a section that follows.

You can get a pop-up "hint" if you hover the mouse pointer over a KDE panel icon. Look at Figure 5.3 again; you will see a pop-up hint with the text KDE control center.

KDE Main Menu

To expose the KDE main menu, you click the application starter button found on the panel at the extreme left. The main menu is shown in Figure 5.4. By the way, some versions of KDE offer a humorous pop-up hint—hover the mouse pointer over the application starter button.

You will notice that the menu maintains a set of application categories, such as Applications, Games, Settings, and so forth. This is rather intuitive, grouping programs based on their functionality. If you look closely, you will see that Find Files is currently selected.

Two menu items should be of immediate interest to you. The KDE control center is used to modify the look of KDE's interface. You can alter colors, the placement and style of window adornments, sound, and the screen saver, just to name a few. The Logout menu item will shut down the current KDE window session and return to the previous system state.

Virtual Desktops

With KDE, the days of "window noise" are over. What do I mean by window noise? This occurs when you have too many windows open on your desktop. It's as if the windows are fighting for screen real estate. Some operating systems have one desktop on which to place application and file windows. With KDE (and other window managers), you have the option of specifying two or more virtual desktops.

Figure 5.4 The KDE Main Menu.

Virtual desktops provide a way to organize your application windows. For example, you could have your Internet dialer program and browser in one virtual desktop, a word processor in another, and a file manager and terminal shell running in a third. Using virtual desktops reduces window clutter (noise) and enables you to manage your productivity.

You can use the mouse or keyboard to switch from one desktop to another. With the mouse, you simply click the appropriate desktop button on the panel. With the keyboard, use Ctrl+F1 through Ctrl+F8 to display the corresponding desktop. You can keystroke Ctrl+Tab to cycle through the desktops.

Each virtual desktop has an associated name. The default names are One, Two, Three, Four, and so on. You can change these names to better fit your

needs. Click the virtual desktop button until a cursor appears (once or twice should do it), backspace to erase, and then type the new name. You can also change the name(s) from the Kpanel Configuration window. Move your mouse onto an empty area of the panel, right-click, and select Configure. Click the desktop's tab page, then click the appropriate desktop name field, and change the name. Alternatively, you can get to the KPanel Configuration window from the Main Menu: Select Settings, Applications, and Panel. While you are at the KPanel Configuration/Desktops tab page, you can also increase or decrease the number of virtual desktops. Use the Visible slider bar to choose the number of desktops you want.

You can move a window from one virtual desktop to another. Click the Window Control menu (at the extreme left on the window's title bar), select To Desktop, and then choose a virtual desktop. If you specified a virtual desktop other than the current one, the current window will disappear.

KDE Sticky Window

Virtual desktops help to reduce window noise and help manage your productivity. A situation may occur when you want a window to exist on every desktop. You might want the X Clock or Calculator to be visible no matter which desktop is current. Enter the sticky window. On the left side of a window's title bar you will see a push pin. To anchor the window to the screen, click the push pin. Clicking the pin again releases the sticky state of the window.

In the previous section, you read how to move a window from one desktop to another. You can also move a window using the push pin. Select the desktop that contains the window you want to move. Anchor the window with the push pin. Switch to the desktop where you want the window. Finally, click the push pin and the window now resides in the current desktop.

KDE Desktop Configuration

Something that has been stressed about KDE and other window managers is configurability. Using KDE's control center, you can change the look and feel of KDE.

You can launch the control center a couple of ways. An icon for the control center can be found on the panel—the icon is a monitor with a green card overlaid. To aid your search, you can use the mouse pointer to view the pop-up tips for each icon. You can also start the KDE control center from the main menu (via the application starter button). Figure 5.5 shows the control center.

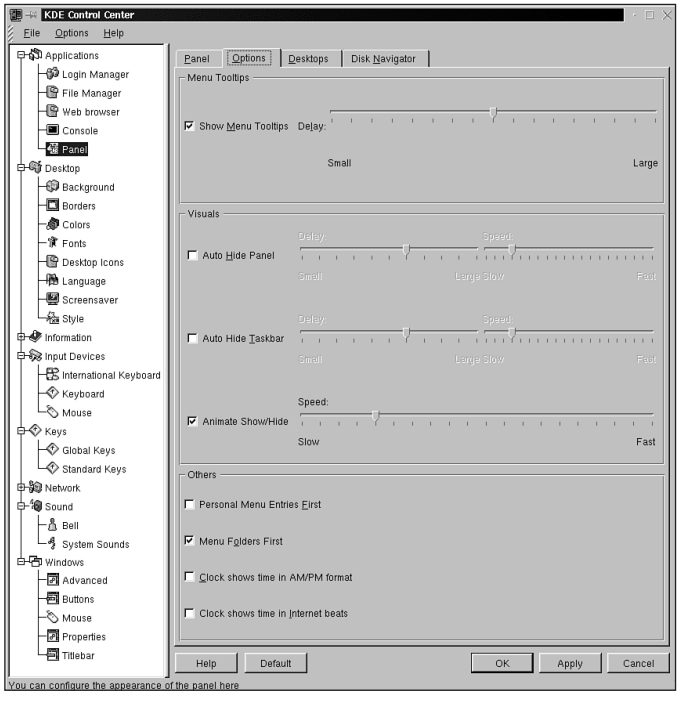

Figure 5.5 The KDE control center.

You will notice that the control center is divided into two panes. The left pane shows a tree view for the major configuration modules. They are called modules because they are actually individual programs. If you open the main menu (via the application starter button) and select Settings, you will see the same modules listed. From the Settings menu, you can launch any of the modules singly. Using the control center allows a central point from which to configure all aspects of KDE. Each module will display its options in the right pane of the control center.

In Figure 5.5, all modules have been expanded except two: Information and Network. The Information module displays read-only data about your machine's hardware and Samba and X Windows status. The Network module holds the Talk Configuration module. The Panel module is currently running in the right pane with the Options tab page displayed.

At the lower portion of the right pane, you will see five buttons: Help, Default, OK, Apply, and Cancel. You use Help to get information about the current module panel. Default restores the factory default settings to the current module panel. OK applies any module changes you have made and closes the module panel. Apply also applies module changes but leaves the module panel visible so that you can continue to make changes. Using Apply is a way to test any changes you are curious about. The Cancel button closes the current module panel without applying changes.

The following is a list of the modules and a description for each:

- **Applications.** Contains the supplemental KDE application and its associated settings, such as the panel and kfm (KDE file manager).
- **Desktop.** You can change various aspects of the desktop, such as background color or wallpaper, window borders, window colors, window style, and so on.
- **Information.** Displays read-only data about your machine's hardware and Samba and X Windows status.
- **Input Devices.** Holds keyboard and mouse settings.
- **Keys.** Contains configuration for key bindings (shortcut keystrokes).
- **Network.** Contains settings for the network.
- **Sound.** You can view/modify sound settings for your system.
- **Windows.** Settings for window adornments and functionality, such as the title bar buttons (inclusion and placement), reactions to mouse events, and so on.

Always Apply Changes

If you make changes to a module, be sure to select OK or Apply before switching to another module configuration; otherwise, you will lose those changes.

Modify a Desktop Setting

The first change most people make to their desktop is the background. Let's be consistent with everyone else and change the KDE background.

First, execute the KDE control center. You can find its icon on the panel—it's represented by a monitor with a green card superimposed. You can also find the control center on the main menu—choose the Application Starter button, then choose the KDE control center item. Click the plus sign (+) next to the desktop module and click Background. Your KDE control center should look like Figure 5.6.

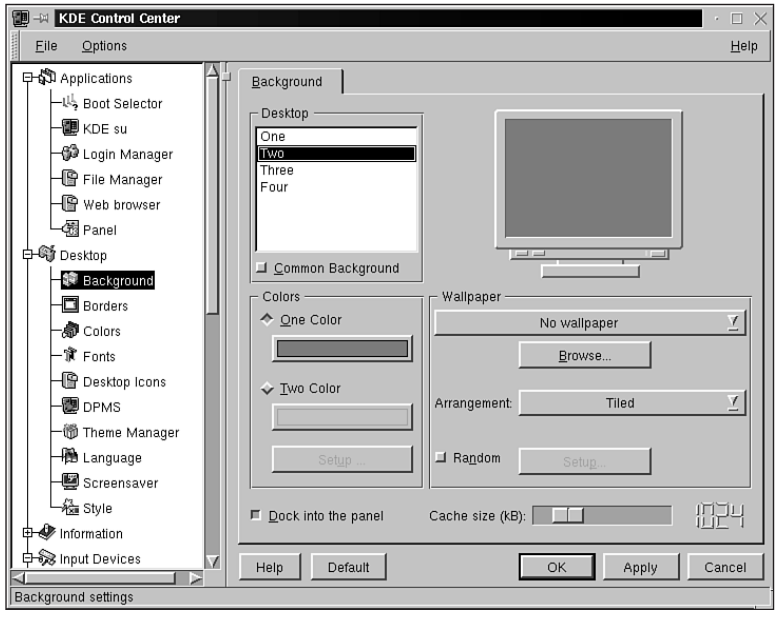

Figure 5.6 The KDE control center with Background selected.

The default background for KDE is blue. Let's make the background something interesting and utilize a bitmap image. Notice that there are three group boxes: Desktop, Colors, and Wallpaper. We will be working in the Wallpaper group box. The first field in the group box is the background drop-down list. If you have not already changed the wallpaper, the current setting is No Wallpaper. Select liquid_helium.jpg or whatever suits your fancy. Click the Apply button to see the effect on the desktop. Remember, if you click the OK button, the desktop module will close. Use Apply to check the result of your change—if you do not like the change, you can select something else. Figure 5.7 shows the result of the background wallpaper change. Your desktop will appear different if you selected some other background wallpaper.

As you move through the wallpaper choices, the resulting change is shown on the sample "monitor" on the Background tab page. You can click the Wallpaper drop-down box and then use the up or down arrow keys to cycle through the wallpaper choices. When you are satisfied with the wallpaper, click OK. Finally, select File, Exit to quit the KDE control center application.

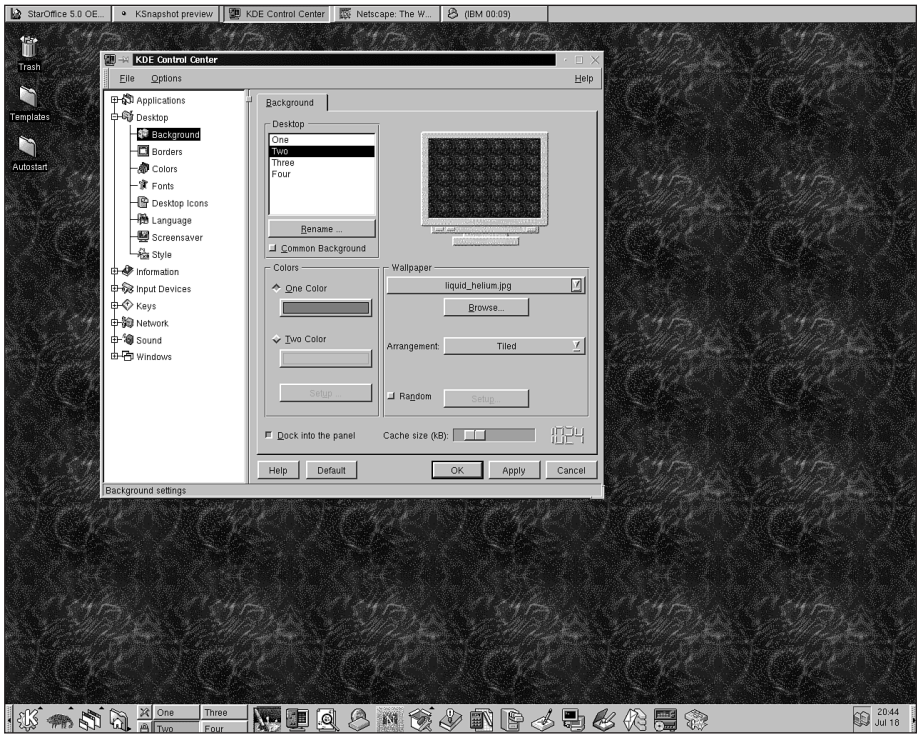

Figure 5.7 KDE desktop with new background wallpaper applied.

Customizing the Panel

If you find yourself executing a command frequently, you can add its icon to the panel. As an experiment, let's add the Font Manager icon to the panel. Click the Application Starter button and then select Panel, Add Application, System, and Font Manager. The icon will show up on the panel. Click the icon to test it out; the KDE Font Manager window will display. You can also drag an icon to the panel. As an example, click and hold the Template icon (on the desktop), drag the icon onto a blank portion of the panel, and release the button.

Suppose that you want to move the icon to another location on the panel. This is very simple to do—place the mouse pointer on the icon, right-click, and select Move. Slide the mouse to the new location and click to anchor the icon. The mouse pointer does not have to be on the panel to move the icon.

As a final exercise, let's remove the icon from the panel. Place the mouse pointer on the icon, right-click, and select Remove. The icon vanishes from the panel.

Right-clicking an icon reveals its context-sensitive menu. You should note that not every icon has a context-sensitive menu. Experimentation will be your best teacher.

By the way, the background wallpaper change affects only the current virtual desktop. If you want the background wallpaper to be applied to all virtual desktops, click the Common Background check box in the Desktop group.

Extreme KDE Customization—Themes

A *theme* is a collection of settings that alters the look and feel for windows (and its adornments), menus, backgrounds, and so on.

The themes URL for KDE is `http://kde.themes.org/`. This site has a gallery of screenshots that show the available themes. Changing a window manager theme is somewhat involved. The easiest way to change a theme is to use a shell script, such as ktinstall (Dmitry Zakharov) or ktheme_perl (Matt Herbert). These utilities can be found at the preceding URL. The customization described in this section assumes the use of ktinstall.

First, open a kvt window session; change to your home directory, and then change to the .kde directory. The following dialog shows this:

```
stimpy $ cd ~/.kde
stimpy $
```

Next, move the `*.tar.gz` file that contains the theme from the download directory to the `~/.kde` directory. The remainder of this section assumes the `Swing_Metal` theme. The following dialog shows the move procedure:

```
stimpy $ mv /tmp/Swing.Metal.tar.gz ./
stimpy $ ls -al
total 923
drwxr-xr-x   3 root     root         1024 Jul 18 21:45 .
drwx--x--x  10 root     root         2048 Jul 18 21:52 ..
-rw-r--r--   1 root     root       665153 Jul 17 15:38 KDE_Ocean.tar.gz
-rw-r--r--   1 100      root         1393 Dec  1  1998 README
-rw-r--r--   1 root     root       215870 Jul 17 15:35 Swing_Metal.tar.gz
-rwxr-xr-x   1 100      root        36579 Dec  1  1998 ktinstall
drwxr-xr-x   7 root     root         1024 Jul 14 22:59 share
stimpy $
```

Before you install the new theme, be sure to record and archive the current theme. The following dialog shows how this is done, utilizing ktinstall:

```
stimpy $ ktinstall -m Default
Theme name [Default]:
Save panel position and size (y/n)? [y]: y
Include sounds (y/n)? [y]: y
```

continues ▸

continued

```
Number of wallpapers (1-8)? [4]:
Readme file [none]:
Done
stimpy $
```

Finally, you install the new theme, as the following dialog demonstrates. Be prepared for some screen flicker as the install script automatically reinitializes KDE.

```
stimpy $ ./ktinstall Swing_Metal.tar.gz
Saving configuration files...
Installing Swing_Metal...
kpanel: waiting for windowmanager
Done.
Stimpy $
```

Figure 5.8 shows the results:

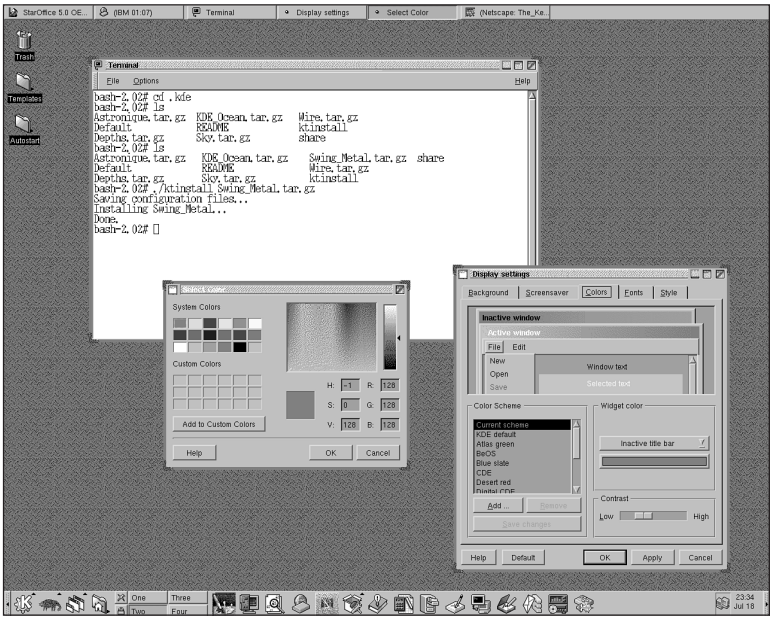

Figure 5.8 KDE Desktop with `Swing_Metal` applied.

If you do not like the results of the new theme, you can use the uninstall feature of ktinstall. The following example shows the syntax:

```
stimpy $ ./ktinstall -u
```

Warning
When using the ktinstall script to install or uninstall a theme, leave your mouse and keyboard alone until the script has finished.

Launching Applications

As mentioned previously in this chapter, you can launch applications and expose windows in a number of ways.

The panel at the bottom of the screen houses application icons. Click the application of choice.

You can also execute an application from the main menu. The main menu is exposed when you click the application starter button found at the extreme left on the panel. The application starter button is adorned with a large "K."

Another method to launch an application is to execute the keystroke sequence Alt+F2, which opens the command window. Type in a command and press Enter. If found, the command will run. Try it: Press Alt+F2, type **xedit** into the command window, and press Enter. The xedit program window should display.

Command-Line Window

In addition to executing a command using its icon, you can open up a terminal window. The KDE terminal window is called *kvt* and provides you with a Linux command-line window. You can find kvt on the panel and the Main Menu. On the panel, look for an icon that looks like a workstation with a pop-up window.

To execute kvt via the main menu, click the application starter button, go to Utilities, and then Terminal. The kvt window appears and a command-line shell is offered.

You can do anything with kvt that you can do with a standard console shell, plus much more.

KDE File Management

File management, using any operating system, is a daily task for most people. Files are downloaded and must be moved. Directories are scanned for files that must be edited. Temporary directories must be purged. Files are copied from one drive to another. Directories and files are renamed. The list of options is virtually endless.

So, how does KDE help us out? Bundled with KDE is a file manager called kfm (KDE file manager). You can launch kfm in one of several ways. First, you can click the home directory icon (a folder with a house) on the panel. A second method is to choose home directory, which is found on the main menu. You can also execute kfm using the command window (Alt+F2) or from a command shell window, such as kvt. Figure 5.9 shows a kfm window.

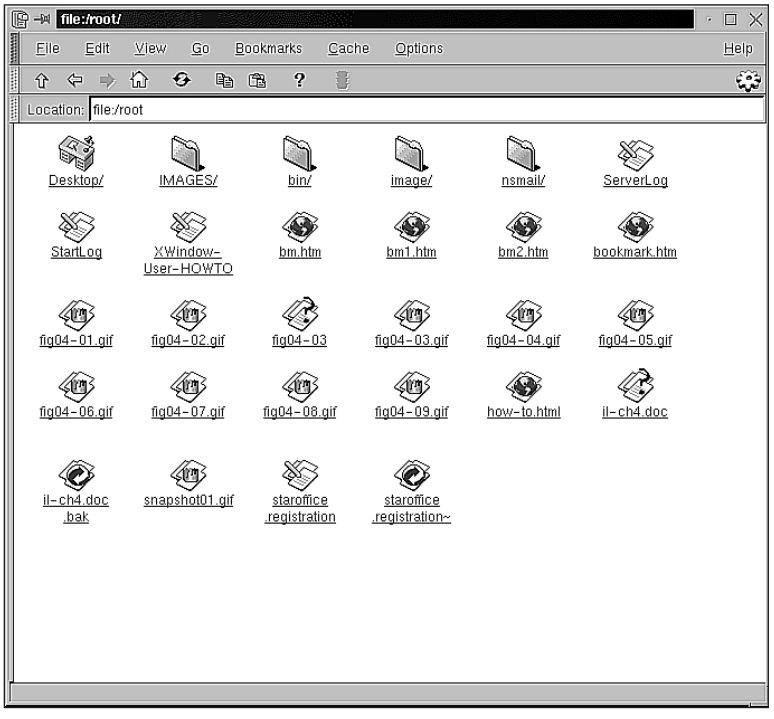

Figure 5.9 The KDE file manager (kfm) window.

You can start kfm with the `-d` option to keep kfm from opening your home directory (this is the default behavior).

Navigating with kfm

An icon that looks like a folder is a directory. Other file types have associated icons that specify their types. If you look again at Figure 5.9, you will notice a number of file types and their corresponding icons.

Opening Directories and Files

To open a directory, click the folder. The contents of the selected folder are shown. The up arrow button on the toolbar (just under the menu) will go to the parent directory. This is synonymous with the `cd ..` command at a shell prompt. The left and right arrow buttons are history buttons.

You can also type directly into the Location bar. kfm supports http, FTP, and file protocols. Any of these protocols can be specified when identifying a filename to open. You can use kfm as a Web browser! Figure 5.10 proves the point.

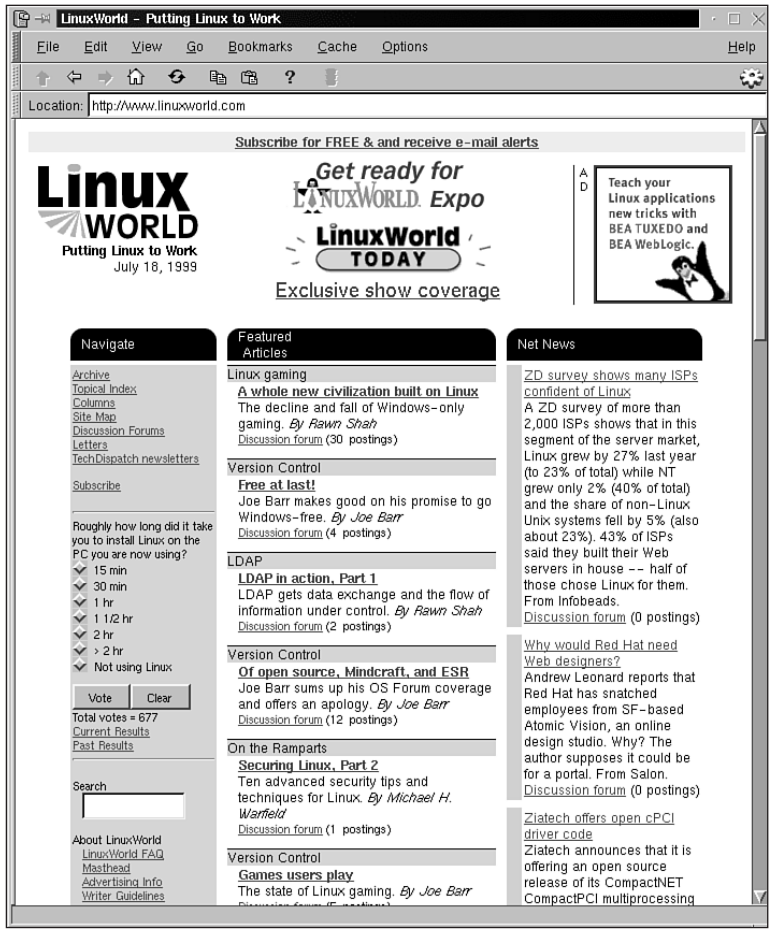

Figure 5.10 The KDE file manager displaying a Web page.

Notice the http protocol specification in the Location bar. Hot links are fully supported, as well as graphics.

Figure 5.11 shows kfm in FTP mode.

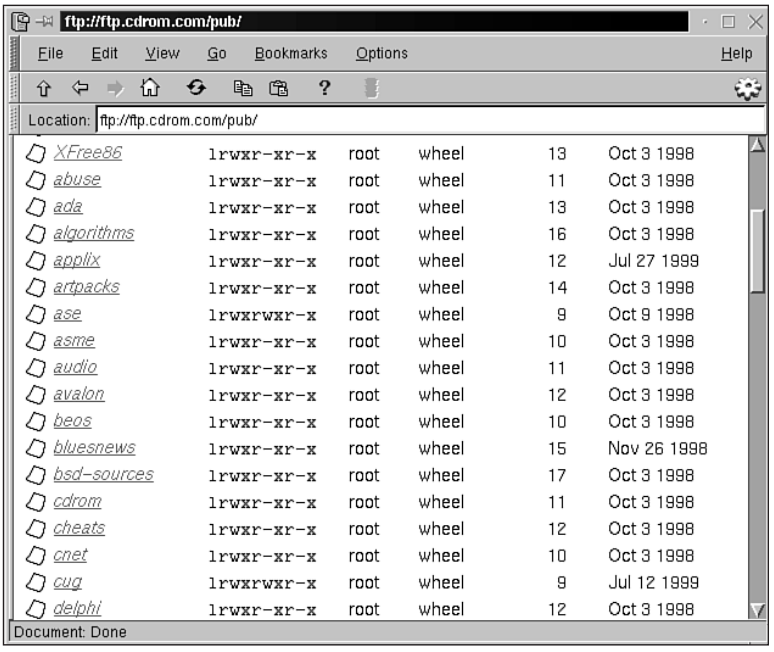

Figure 5.11 The KDE file manager using the FTP protocol.

Under kfm's View menu, the long format has been selected, showing a listing similar to the `ls -al` command. The default format (or view) is Icon. Other views are Short and Text (no graphics). Other options under the View menu are Show Hidden Files, Show Tree, and an interesting one—Show Thumbnails. If the file is a graphical image, the file's icon is displayed as a thumbnail graphic. Figure 5.12 confirms this magic.

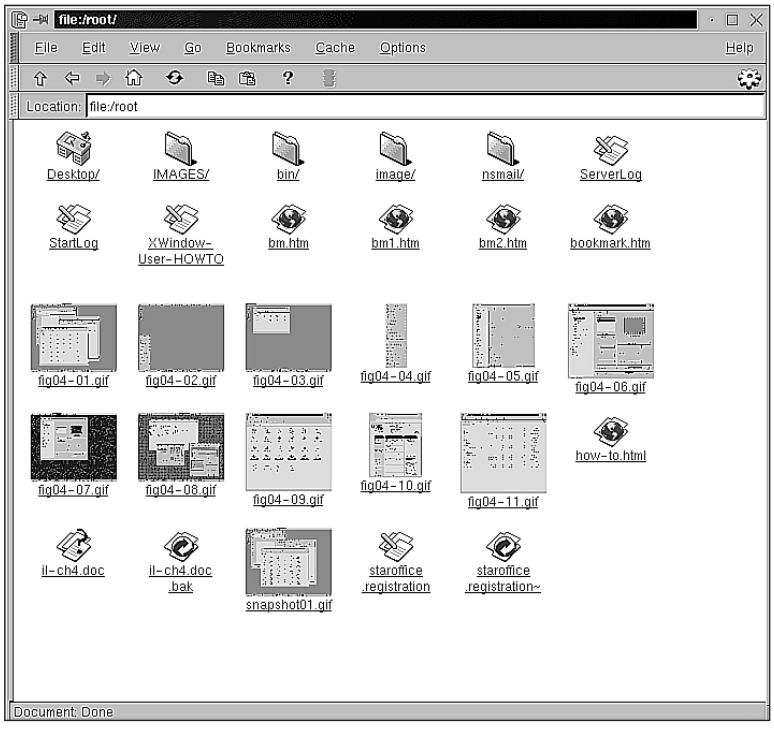

Figure 5.12 The KDE file manager in thumbnail view.

The downside to the thumbnail view is that it takes a little longer to display a directory (if graphical files are present).

With kfm, you can also view the contents of zip and tar files. Just click the archive file.

Copy, Move, and Link

If you need to move, copy, or create a file link, click a file, drag the icon to the destination, and release. A pop-up menu offers the choices Copy, Move, or Link. A link created by kfm is a soft link rather than a hard link.

You can drag the file from kfm to the desktop or to another kfm window. To open a second kfm window, select File, New Window. With this technique, you can browse to the destination (second kfm) and drag files from one kfm window to another.

Bookmarks

If you are familiar with the bookmark feature of Web browsers, kfm's bookmarks should not surprise you. To the uninitiated, a bookmark is an anchor to some file entity. If you bookmark a directory, for example, the next time you select the bookmark, kfm will display the directory's contents. If a file is bookmarked, it is opened with the appropriate application. You can bookmark any file by right-clicking the file and selecting Add to Bookmarks.

File History

Found under kfm's Cache menu, you will see the Show History option. If you choose Show History, you see a list of URL entries, representing local, http, and FTP filenames. Basically, the History list shows where you have been.

To go to a location listed in the History list, simply click the URL of choice.

File Properties

To display the properties of a file, right-click the file and select Properties. If you have proper rights, you can rename the file and change any number of attributes for User, Group, and Others.

Mounting a Device

A common task in Linux is the installation of software and updates to a Linux system using a CD-ROM. You might also mount a CD-ROM on a daily basis, accessing the data stored there. You could put the entry in the `/etc/fstab` file to automatically mount the device at boot up. With CD-ROMs and floppy disks, however, you must mount to read the media and unmount it to remove it. You must perform this cycle every time you want to read another CD-ROM or floppy. In this section, we create a desktop icon to automate the process of mounting and unmounting a CD-ROM.

The first step is to click the Templates icon on the desktop. The KDE file manager executes and displays the contents of the Templates folder.

The second step involves dragging the Device icon onto the desktop. Click and hold the Device icon, drag it onto the desktop, and release the mouse button. A pop-up menu appears; select Copy. You should now have an icon named Device on your desktop.

The next step is to modify the attributes of the Device icon. Click the new Device icon and choose Properties from the pop-up menu. The Properties dialog box is displayed. Figure 5.13 shows the General tab page.

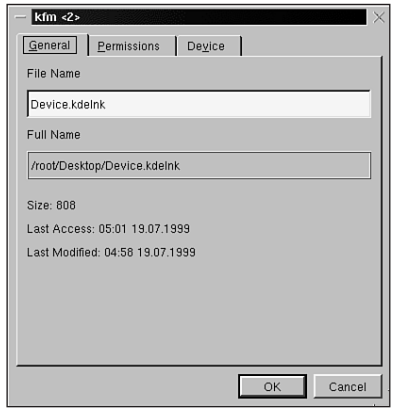

Figure 5.13 The General tab for Device Properties.

Change the filename to **CD-ROM.kdelnk**. Next, select the Device tab on the Properties dialog box. Figure 5.14 shows the Device tab page.

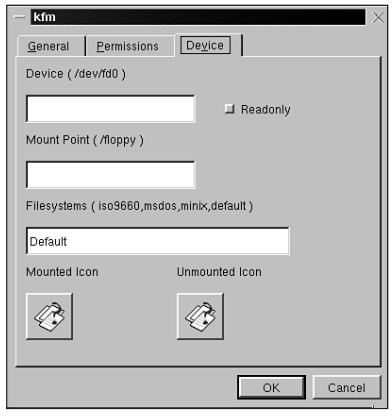

Figure 5.14 The Device tab for Device Properties.

For the Device field, you need to supply the name of the device that is associated with your CD-ROM drive. On my machine it is `/dev/hdc`. The device for your machine may be different. Be sure to click the Read-only check box if your CD-ROM is a read-only device (most are). Next, type the mount point for the CD-ROM. This can be any directory you have created for mounting the device. You might have a directory named `/cdrom` or `/mnt/cdrom` on which to mount your physical CD-ROM device. In the Filesystems field, type **iso9660**. Next, click the Mounted Icon button and

select the Mounted icon from the list—its name is `cdrom_mount.xpm`. Finally click the Mounted Icon button and select the Unmounted icon from the list—its name is `cdrom_unmount.xpm`. Figure 5.15 is a snapshot of the Device tab page filled in—the correct icons are shown here.

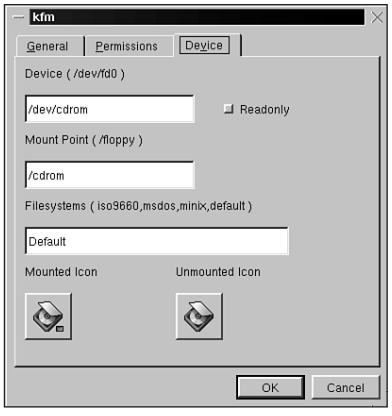

Figure 5.15 The Device tab for Device Properties (filled in).

After all fields are filled in with the appropriate entries, click the OK button. The Device icon should now read CD-ROM, and the Unmounted icon should be displayed.

To test out the new icon, open the CD-ROM drive door and insert a CD-ROM disc. Close the door and click the (new) CD-ROM desktop icon. The icon should change to the mounted icon and a kfm window should display, showing the root directory of the CD-ROM. When you are done, right-click the CD-ROM icon and choose Unmount. You can now open the CD-ROM drive door and remove the disc media.

Printer Setup

In the previous section, you set up a CD-ROM device icon on the desktop to mount and unmount a CD-ROM device. You can do the same thing for a printer. To print files, you drag and drop files onto the desktop Printer icon. Follow along as we create a Printer icon.

The first step is to single-click the Templates icon on the desktop. The KDE file manager will execute and display the contents of the Templates folder.

Next, drag the Program icon out onto the desktop. Click the Program icon, drag it onto the desktop, and release the mouse button. A pop-up menu appears; select Copy. You should now have an icon named Program on your desktop.

The third step is to modify the attributes of the Program icon. Right-click the new Program icon and choose Properties from the pop-up menu. The Properties dialog box is displayed. Figure 5.16 shows the General tab page.

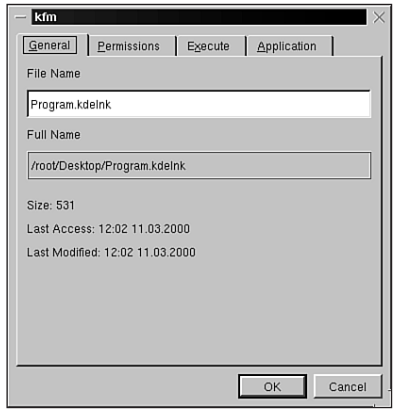

Figure 5.16 The General tab for Program Properties.

Change the filename to **Printer.kdelnk**. Next, select the Execute tab page on the Properties dialog box and enter **lpr %f** for the Execute field. The following snapshot, Figure 5.17, shows the Execute tab page.

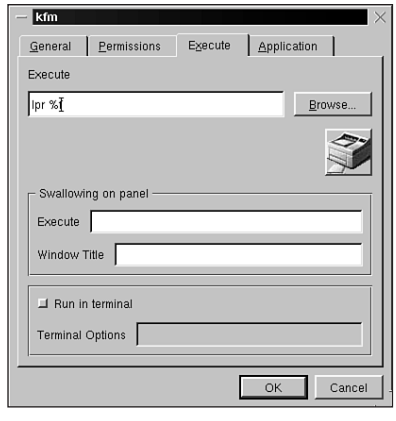

Figure 5.17 The Execute tab for Program Properties.

Click the "cog" icon to select a printer icon from the list. More than one printer icon may be available—select the one that appeals to you.

Click the OK button to save the changes and dismiss the dialog box. You can test out your new Printer icon by dragging a file and dropping it on the icon.

GNOME

GNOME can be launched manually from the command line, or you can instruct the system to start it automatically after system initialization. To start up the GNOME environment, as with most other window managers, use the `startx` command. We assume that you have set up GNOME to be the default window manager. The syntax for `startx` is as follows:

```
startx  [ [client] options] [ -- [server] options
```

The `startx` command is, as a rule, a shell script and is used to start the X Windows system and subsequently, the window manager. You can start up GNOME as demonstrated in the following dialog:

```
stimpy $ startx
stimpy $
```

Figure 5.18 shows GNOME after it has initialized.

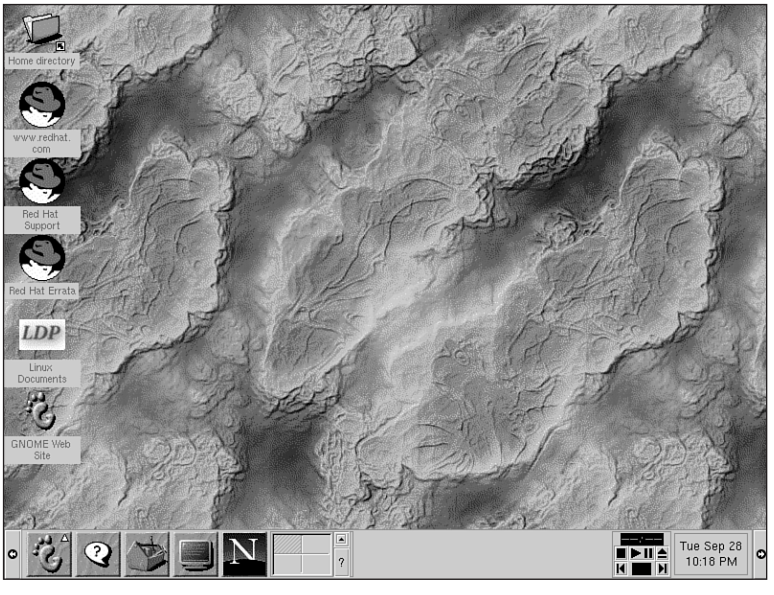

Figure 5.18 The GNOME environment after startup.

Considering that GNOME is highly configurable, the previous figure may not look the same as your GNOME display. The horizontal bar at the bottom of the display is called the GNOME panel. The GNOME panel houses menus and other icons called *applets*. An applet is nothing more than a program that resides on the GNOME panel. Take a look at the far right of the GNOME panel; this particular applet is the GNOME panel clock, showing the date and time.

All the space above the GNOME panel is referred to as the desktop, as it is in KDE and most other window managers. In the previous figure, you can see a number of icons, such as Home Directory, Linux Documents, and GNOME Web Site, on the left edge of the desktop. These icons refer to various URLs. You can place assorted objects on the desktop. For example, if you place a directory object on the desktop and double-click that object, the GNOME file manager executes and the respective directory contents are displayed. Other objects, such as programs or data files, can be placed on the desktop. If you double-click a data file, its associated application executes and the data file is opened. You should consider the desktop as a place where you put your most-used applications, data files, and directories.

Take another look at the GNOME panel (the bar at the bottom) in Figure 5.18. Just to the right of the five icons, you will see what is called the GNOME pager. The pager shows four small windows, arranged and viewed (logically) as a window pane. The pager shows any running applications and their desktop locations. To the right of the pager is the Task List——the Task List shows any running applications for the current virtual display.

In the sections that follow, we discuss the GNOME panel, the pager, and the desktop in more detail.

GNOME Panel

The GNOME panel provides a number of services. First, it houses various icons that represent files, programs, or menus. You can add and remove icons from the panel, as well as menus. The panel is a convenient repository to hold your frequently used commands. This provides you with a central point from which to execute your favorite commands.

The GNOME panel also houses the pager. The default location for the pager is normally in the center of the panel. The GNOME panel defaults the number of virtual desktops to four. You can have up to eight virtual desktops represented on the panel, configurable through the GNOME control center. We discuss the pager and virtual desktops in more detail in the later section "GNOME Pager and Virtual Desktops."

Pop-up "hints" are available if you hover the mouse pointer over any of the panel icons. Figure 5.19 shows a pop-up hint in action for the Netscape icon.

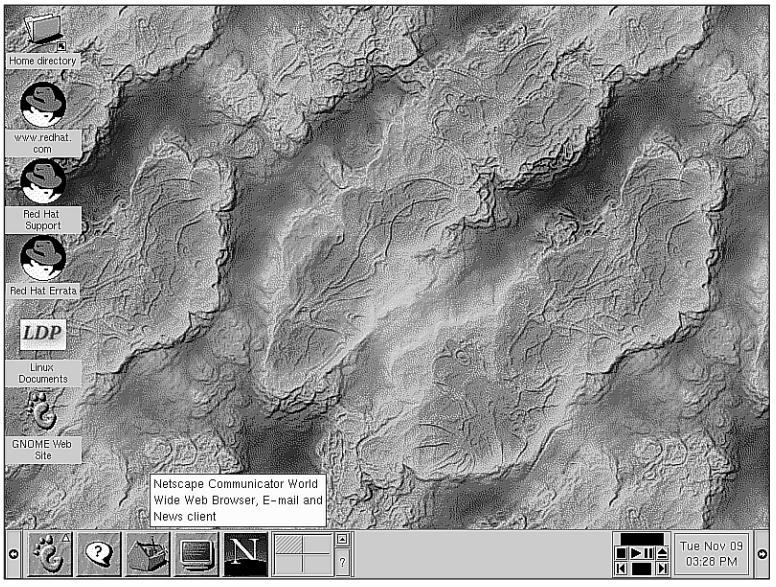

Figure 5.19 A pop-up hint in action.

The GNOME main menu icon is found on the panel. It is located at the extreme left on the panel and it looks like a bare foot. You have to be cautious when describing the (physical) location of applets on the GNOME panel——you can move any applet along the panel, effectively changing its location. In the next section, we discuss the GNOME main menu.

GNOME Main Menu

To expose the GNOME main menu, click the application starter button found on the panel at the extreme left. The main menu is shown in Figure 5.20.

Figure 5.20 The GNOME main menu.

As with menus from other window managers, we see various submenus containing options that are logically organized. For example, if you select the Games menu, a pop-up menu will display, showing a list of games that are installed (if you installed them, that is) and are ready to be executed.

Take note of the menu item Log Out. This option will stop the current GNOME graphical interface and return you to the (text mode) command prompt. At the Really Log Out dialog box, you can choose to Log out, Halt, or Reboot. If you choose Log Out, you will be returned to the command prompt. The Reboot choice will shut down GNOME, return to the command prompt, and then initiate a reboot sequence. The Halt option will shut down GNOME, return to the command line, and execute the `halt` command. You can restart GNOME, as described earlier, by executing the `startx` command.

One of the first menu items you will want to execute can be found under the Settings submenu. The item is titled GNOME control center and executing this command will allow you to modify your GNOME environment. It is similar in operation to the KDE control center——you can change the background color or image, add new themes, adjust sound events, and change keyboard settings, among other options.

The GNOME Pager and Virtual Desktops

The GNOME environment offers a way to organize your running applications using the pager. The pager provides you with the ability to place (or execute) applications within a specific virtual desktop. The two main areas of the pager are the virtual desktop area and the application area. The virtual desktop area shows all the available virtual desktops, and the application area contains any running applications. The desktop area depicts the individual desktops as panes within an encompassing frame. The application area displays each application name within its own rectangle, to the right of the desktop area. Figure 5.21 shows the pager in action.

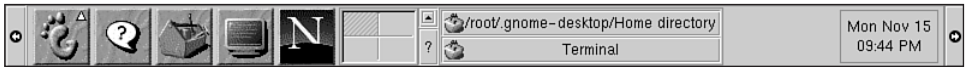

Figure 5.21 The GNOME pager.

Virtual desktops provide you with the capability to organize running applications. For example, you might run your office application on one virtual desktop, a file manager and terminal shell on a second desktop, and a Web browser on a third desktop. Virtual desktops allow you to better manage your productivity, and they help to reduce window clutter.

The mouse and keyboard can be used to switch from one virtual desktop to another. To switch to another virtual desktop using the mouse, click the appropriate virtual desktop on the pager's application area. With the keyboard, you use Alt+F1 through Alt+F*xx* (*xx* is the maximum number of desktops) to display the corresponding desktop. For example, Alt+F3 displays the third virtual desktop on the pager.

The default behavior for the GNOME pager is to show running tasks only for the current virtual desktop. You can change this behavior by opening the GNOME pager settings configuration window. To bring up this window, place the mouse on the pager's application area, right-click, and then select Properties. When the GNOME pager settings window appears, select the Tasklist tab page. Figure 5.22 shows the Pager Settings window.

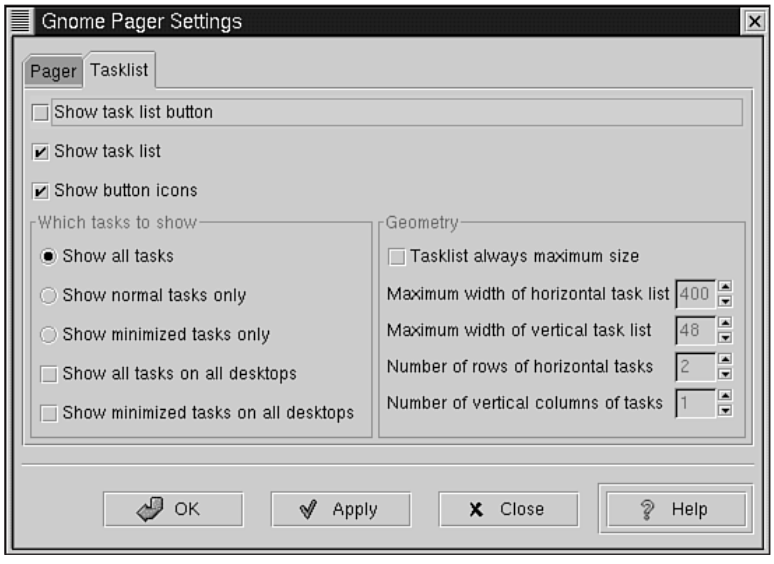

Figure 5.22 The GNOME Pager Settings window.

To show all tasks running, select (check) both Show All Tasks on All Desktops and Show Minimized Tasks on All Desktops. These check boxes are found under the Which Tasks to Show section. When you are finished, click the OK button. Now all running tasks, no matter which virtual desktop they are running on, will show up on the application view of the pager.

You can move an application window from one virtual desktop to another. To do so, click the Window Control menu (at the extreme left on the window's title bar), select Desktop, and then choose a virtual desktop. If you specify a virtual desktop other than the current one, the window will disappear. You should note that the individual desktops are not named—you move it to another desktop by specifying the direction of the new desktop (right, left, above, below).

The pager is also the home to application icons; these are housed on the pager's Quicklaunch area. The Quicklaunch area spans the section from the left edge of the pager to the left of the desktop area. Refer to Figure 5.21; you will see five launchers consisting of the Main Menu, Help, GNOME Configuration Tool, Terminal emulation program, and Netscape Communicator. You can launch these applications by clicking the appropriate applet icon.

GNOME Sticky Window

There may be times when you want an application's window to be visible on all virtual desktops. For example, you might want a clock or a chat program to be visible no matter which desktop is current. You do this by changing the stickiness of the application's window. Let's give it a try.

Select the Main Menu, select Utilities, and then select GNOME DiskFree. The DiskFree window should be displayed, showing a usage dial for each partition you have mounted. Click the System button (at the upper-left of the window) and select the Stick/Unstick option. You will notice that the title bar of the window no longer shows its color, even if you click the title bar. Now, click each virtual desktop to see the effect. You will notice that DiskFree's window stays visible and in the same position.

The previous section explained how to move a window from one desktop to another. Using the stickiness feature allows you to move a window from one desktop to another. Select the desktop that contains the application window you want to move. Select the Stick/Unstick option from the window's System menu. Switch to the desktop where you want the window to reside. Finally, select the Stick/Unstick option again from the window's System menu. The window should now reside within the current desktop.

GNOME Desktop Configuration

Something unique to Linux window managers is their configurability. GNOME is no exception; you can change the look and feel of GNOME using the GNOME control center.

The control center can be launched in a couple of ways. An applet icon exists on the panel—the icon simply portrays a wooden toolbox with tools. You can use the mouse pointer to view the pop-up tips for each icon to help you find the applet. You can also start the GNOME control center from the Settings menu option on the main menu. Figure 5.23 shows the control center.

The control center is divided into two separate panes. The left pane consists of a tree view for the major configuration modules, or *capplets*. These capplets are actually individual programs, serving a specific purpose. Your control center may have more or fewer capplets than what is shown in the previous figure. The right pane is the work area. This is where the capplet displays its configuration options. Because each capplet is really an individual program, you can launch each one individually. You can find the individual capplets on the Settings menu. In addition to the option GNOME control center, you will see Desktop, Multimedia, and so on. For example, if you

want to alter the mouse settings, select the main menu, Settings, Peripherals, and then Mouse. This will execute the control center and expose the Mouse capplet.

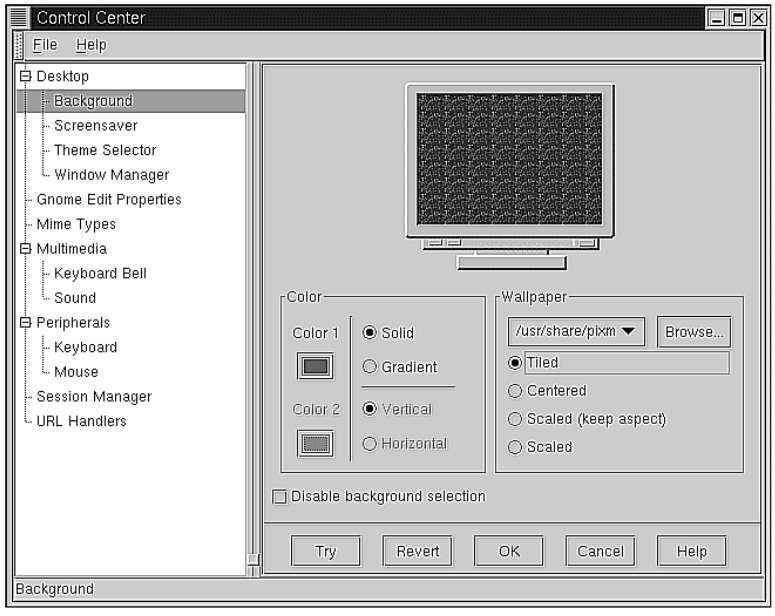

Figure 5.23 The GNOME control center.

Figure 5.23, all modules have been expanded to show their respective choices. Notice that the Background option (under Desktop) is currently selected. In the workspace (right panel), you will see the options for Background configuration. You can select a color as either a solid or a gradient—or use a bitmap to paint wallpaper as the background.

At the lower portion of the right pane, you will see five buttons: Try, Revert, OK, Cancel, and Help. Use Help to get information about the current capplet. Revert is used to restore the factory default settings for the current capplet. OK applies any capplet configuration changes and closes the capplet panel (but not the control center). Try also applies capplet changes, but leaves the capplet panel visible so you can continue to make changes. You use Try as a way to test any changes you have made. The Cancel button closes the current module panel without applying changes.

Be sure to peruse all the capplets available. Experiment with each capplet to see the changes that can be executed.

Modify a Desktop Setting

Most people like to personalize their background. As an exercise, let's change the GNOME background.

If the GNOME control center is not running, run it now. When the control center is displayed, open the desktop section and select the Background capplet. Your GNOME control center should look like the one shown in Figure 5.24.

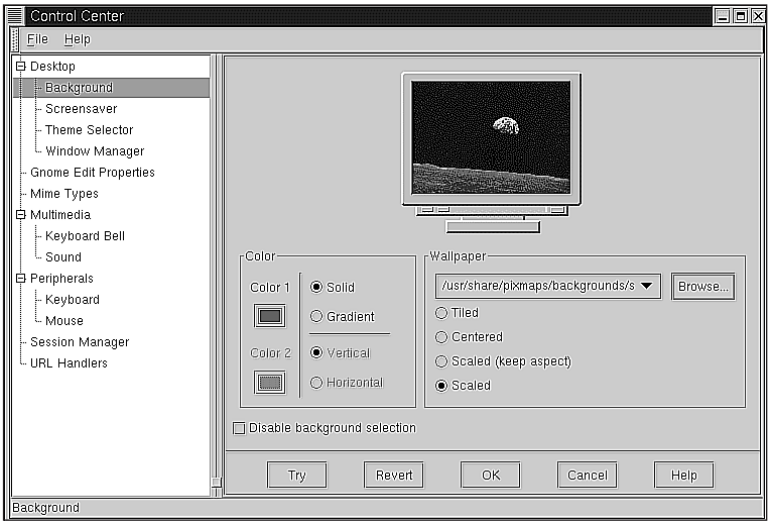

Figure 5.24 The GNOME control center with Background selected.

Let's change the background to something interesting and utilize a bitmap image. In the section titled Wallpaper, click the Browse button. The default location for the bitmaps is in `/usr/share/pixmaps/backgrounds` and its subdirectories. Find a bitmap that is appealing to you and click the OK button to dismiss the Wallpaper Selection dialog box. Figure 5.25 shows the changes made on my system.

As you select the various wallpaper choices, the resulting change is shown on the sample monitor on the Background workspace panel. When you are satisfied with your new wallpaper, click the OK button. To close the control center, select File, and then Exit.

Be sure to experiment with the other capplets found on the control center; after all, Linux is about personal customization.

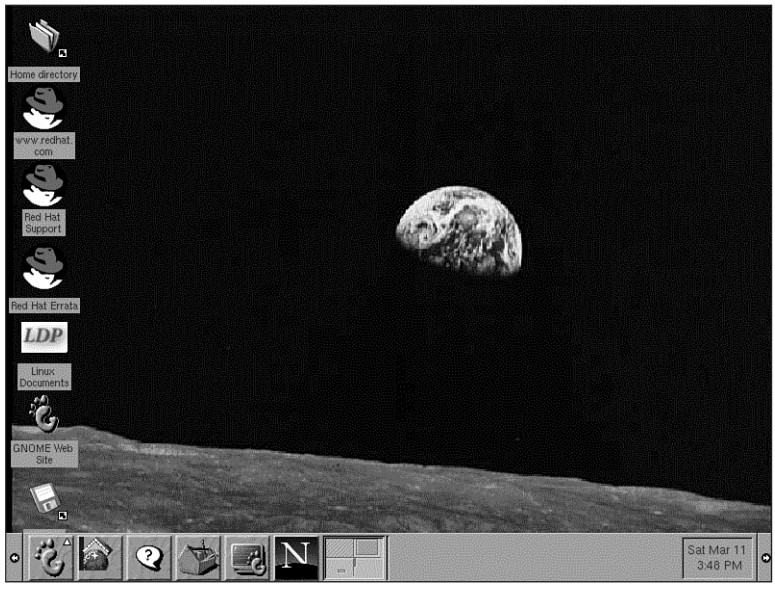

Figure 5.25 The GNOME desktop with new background wallpaper applied.

Customizing the Panel

The GNOME panel comes equipped with its own configuration tool, as do other parts of GNOME. This section demonstrates some configuration options for the panel.

First things first. Place the mouse on a blank area of the panel, right-click, and then select Global Properties. This executes the Global Panel Configuration dialog box, as shown in Figure 5.26.

The Miscellaneous tab page is currently displayed, showing its options. As an example, let's change the applet padding value. Applet padding determines the amount of space that separates each applet on the panel; the default is 3. Change the slider to 10 and click the Apply button. Notice the change that has taken effect; more white space is between each applet on the panel. Before continuing, you might want to return the padding to its default value.

Some GNOME users like to lock their applets in place on the panel. You can do this by selecting the Free Movement option button within the Movement section (Miscellaneous tab page). If this option button is selected, you will be unable to move the applets along the panel.

You might also visit the Animation tab page. This page enables you to alter the animation effects for the panel. You can also turn the feature off by unchecking the Enable Animations check box.

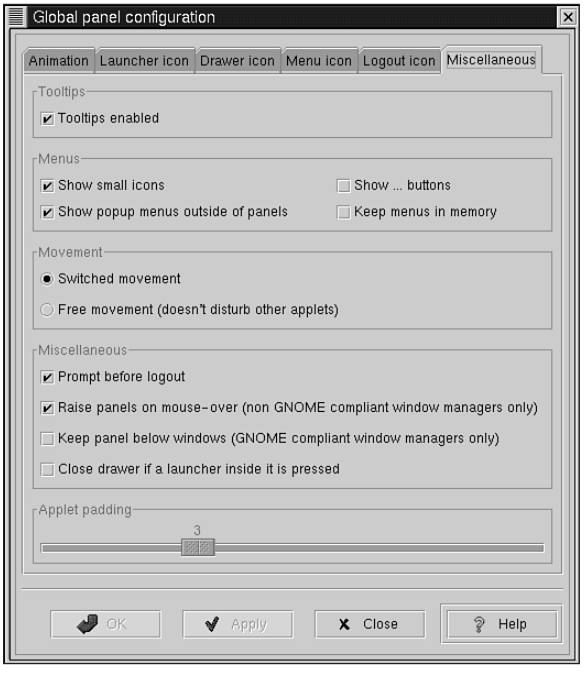

Figure 5.26 The Global Panel Configuration dialog box.

Launching Applications

Applications can be launched in several ways. You can select an application icon from the GNOME main menu, from an application applet on the panel, from the Run Program dialog box, or from a terminal window.

You can execute an application from the GNOME main menu. To expose the main menu, click the main menu button found at the extreme left on the panel (the main menu button is a stylized foot).

The GNOME panel at the bottom of the screen houses application applet icons. Click the application applet to execute it.

You can also execute an application using the Run Program dialog window. Run Program is a simple dialog box, requiring only a program name and a mouse click on the Run button. From the main menu, select Run Program. The Run Program dialog box should display. Next, type **gdiskfree** into the text box and click the Run button. The GNOME DiskFree application window should display and the Run Program dialog box should disappear. Select File, and then Exit to close the DiskFree application.

Command-Line Window

You can also execute an application from a GNOME terminal window. The GNOME terminal window command is simply named GNOME Terminal. It provides you with a graphical Linux command-line window. You can find the GNOME Terminal on the panel and on the main menu. On the panel, look for an icon that looks like a monitor. You can find the GNOME Terminal on the Utilities menu via the main menu.

You can, of course, do anything from within the GNOME Terminal that you can do with a standard console shell.

GNOME File Management

It seems that a day does not pass without performing various file-management tasks. This is not specific to Linux—other operating systems offer various forms of file management. You need a way to manipulate files and directories, such as create, delete, and move.

GNOME provides a graphical file manager named gmc. The GNOME file manager can be executed from the main menu or from a GNOME terminal window by executing the command `gmc` at the command prompt. Additionally, you can execute gmc using the Run Program command from the main menu. Figure 5.27 shows the GNOME file manager.

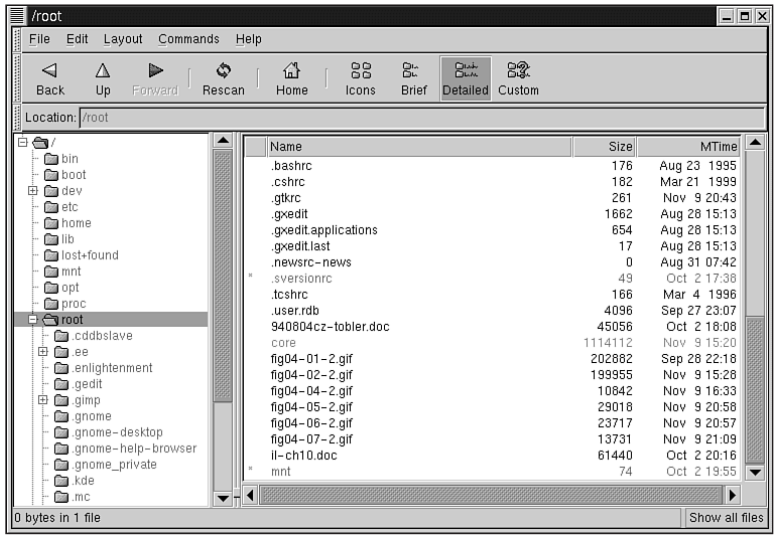

Figure 5.27 The GNOME file manager (gmc) window.

You might be curious about the GNOME file manager command being named `gmc`. It is called `gmc` because it is the GNOME edition of the Midnight Commander file manager.

Navigating with GNOME File Manager

As can be expected, a folder icon represents a directory. If the file manager is in Icon view, other file types will have an associated icon. If the file manager is in List (Brief, Detailed, or Custom) view, files are represented textually.

The GNOME file manager contains two navigation windows. The left pane contains the tree view and the right pane contains the directory view. The default directory view for gmc is the Icon view, and it displays icons for each type of file. You can also switch the file manager into List view, either Brief, Detailed, or Custom. Each of these is a list view, showing different levels of detail for the contents of the current directory. In these list views, you can also click any of the column tiles, such as Size, to sort the view.

Opening Directories and Files

In the tree-view pane, you can open a directory by clicking the plus (+) sign and close a directory by clicking the minus (–) sign.

To open a directory in the Directory pane, double-click the folder you want to open. The contents of the selected folder are shown on the right panel. You can use the Back and Up icons, found on the toolbar, to move back up through the directory hierarchy.

You can also type a directory name directly into the Location bar. Click in the Location bar and type the directory entry you require.

The GNOME file manager also supports the FTP protocol. You can specify any valid FTP address and filename to open.

Copy, Move, and Link

If you need to move, copy, or create a file link, right-click a file and specify the operation desired. You can move a file by clicking and holding the source file and then dragging it to the destination directory.

You can drag the file from gmc to the desktop or to another gmc window. To open a second gmc window, select File and Create New Window. With this technique, you can browse to the destination (the second gmc) and drag files from one gmc window to another.

File Properties

To display the properties of a file, right-click the file and select Properties. If you have proper rights, you can rename the file and change any number of attributes for User, Group, and Others.

Summary

This chapter covered a lot of territory concerning X Windows, specifically on the K Desktop Environment. The various parts of the display were covered, including the panel, the desktop, the main menu, and the taskbar.

We discussed a few of the more popular window managers, such as AfterStep, CDE, Enlightenment, fvwm, fvwm95, GNOME, KDE, olwm, olvwm, and twm.

Next, we covered KDE in detail. KDE is a popular window manager that is included with most Linux distributions. You read how to manipulate virtual desktops and configure the desktop. How to add a new theme to KDE was covered, enabling you to change the look and feel of your KDE.

Launching applications and file management using kfm were covered. Finally, we added two icons, CD-ROM and Printer, to the desktop to help automate reading CD-ROM discs and printing files, respectively.

We also looked at the GNOME environment in detail. GNOME is highly configurable and is considered the newest generation of graphical environments for Linux.

GNOME consists of the panel, which houses menus and other icons known as applets (not to be confused with Java applets). GNOME also consists of the desktop—the area of the screen where running applications reside. The GNOME pager and virtual desktops were discussed.

We also discussed sticky windows and desktop configuration for GNOME. A window that is "sticky" will continue to be displayed in every virtual desktop. Next, the GNOME control center was covered, showing how to configure the environment.

Launching applications under GNOME was discussed, describing several ways to execute applications under the GNOME environment. Finally, we closed the chapter by discussing directory and file management using the GNOME file manager.