

Red Hat Linux 7.1

**The Official Red Hat Linux Getting Started
Guide**

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Introduction

Welcome to the *Official Red Hat Linux Getting Started Guide*!

By now, you should have read the *Official Red Hat Linux x86 Installation Guide* and successfully installed Red Hat Linux. This manual will help new and intermediate users navigate Red Hat Linux and perform common tasks.

This manual is task-oriented. You will find useful tips, hints, warnings, and screen shots interspersed throughout. First, you will learn the basics of using Red Hat Linux, such as customizing a desktop, configuring a printer, and getting online. Once the basics are covered, the tasks covered in this manual become progressively more advanced.

Most users choose to work within either the GNOME or the KDE graphical desktop environments. The *Official Red Hat Linux Getting Started Guide* focuses primarily on how to perform tasks in these two environments.

Topics discussed include:

- Using the GNOME and KDE graphical desktop environments
- Managing files and directories
- Navigating the filesystem
- How to connect to the Internet
- Upgrading applications
- Common questions and answers
- A glossary of frequently-used technical terms

After conquering the basics of your Red Hat Linux system, you may need information on more advanced topics. You can find this information in the *Official Red Hat Linux Customization Guide* and the *Official Red Hat Linux Reference Guide*. All of our manuals are available in HTML and PDF formats at <http://www.redhat.com/support/manuals>.

Introductory Terms

When you learn about a new operating system, you will also need to learn new terminology. Here are a few basic terms to become familiar with before you continue reading this manual. You will see these terms often:

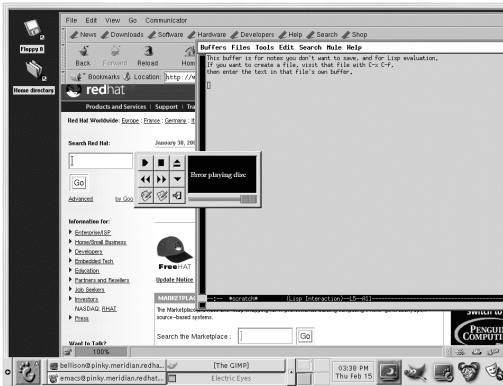
- **Shell prompt:** A software interface (similar to a DOS screen) between the user and the operating system. The shell interprets commands entered by the user and passes them on to the operating system. The shell prompt displays the command line.
-

- **Command line:** The place in the shell prompt where commands are typed.
- **Command:** An instruction given to the computer, most often with the keyboard or mouse.
- **Graphical User Interface (GUI):** A screen with icons, menus, and panels for the user to click on to initiate functions.
- **GNOME and KDE:** Two popular GUIs included with Red Hat Linux.
- **Panel:** A GUI environment toolbar, usually located across the bottom of the screen. The panel contains the main menu button, among other things, and can be customized by the user.
- **Root:** The root user account is created during installation and has complete access to your system. You must be logged in as root to accomplish certain system administration tasks. User accounts are created so typical user tasks can be done without using the root account, to reduce the chance of damaging your OS.
- **su and su -:** The command `su` gives you access to the root account or other accounts on your system. When you `su` to root, or switch to your root account while still inside your user account shell, you have access to important system files that you can change, or damage, permanently. Logging in with the `su -` command makes you root within the root account shell. If you log in as root with `su -`, you have access to certain commands that the `su` command does not grant. Use caution when you are logged in as root.
- **Man page and info page:** Man (short for manual) and info pages give detailed information about a command or file (man pages tend to be brief and provide less explanation than info pages). To read the man page for the `su` command, for example, type `man su` at a shell prompt (or type `info su` for the info page). To close one of these pages, press `[q]`.
- **X or X Window System:** These terms refer to the graphical user interface environments. If you are "in X" or "running X" you are working in a GUI rather than a console environment.
- **Console:** Console, shell prompt, terminal, "the screen that looks like DOS" — these are all the same thing: a non-graphical interface. This environment has no icons, limited menus, and requires that you type commands to perform tasks, rather than pointing and clicking with your mouse.

A Note About Environments

Your Red Hat Linux system is more than the graphical user interface. However, most new and intermediate users are likely to work within the graphical environment. The Official Red Hat Linux Getting Started Guide demonstrates the techniques behind accomplishing tasks in two popular environments: GNOME (as shown in Figure 1, *A GNOME Desktop*) and KDE.

Figure 1 A GNOME Desktop



Much of what you can do in a graphical environment can be done from the shell prompt. In addition to the chapters covering KDE and GNOME, this guide contains plenty of useful information on using the shell prompt (as shown in Figure 2, *Viewing Text in a Shell Prompt*). Using the shell prompt requires learning commands to perform tasks, as opposed to using the menus and icons in a graphical environment. The shell prompt can often perform tasks faster than a graphical environment, but may take more time and effort to learn to use. The shell prompt is something that Linux users generally become comfortable with over time.

Figure 2 Viewing Text in a Shell Prompt

```

man(1)                                     man(1)

NAME
  man - format and display the on-line manual pages
  manpath - determine user's search path for man pages

SYNOPSIS
  man [-acdfFhkkktwW] [-m system] [-p string] [-C config_file] [-M path]
  [-P pager] [-S section_list] [section] name ...

DESCRIPTION
  man formats and displays the on-line manual pages. This version knows
  about the MANPATH and (MAN)PAGER environment variables, so you can
  have your own set(s) of personal man pages and choose whatever program
  you like to display the formatted pages. If section is specified, man
  only looks in that section of the manual. You may also specify the
  order to search the sections for entries and which preprocessors to
  run on the source files via command line options or environment vari-
  ables. If name contains a / then it is first tried as a filename, so
  that you can do man ./foo.5 or even man /cd/foo/bar.1.gz.

OPTIONS
  -C config_file
  :

```

Where to Find More Information

If you have the Official Red Hat Linux boxed set, remember to take a look through the Red Hat Linux 7.1 Documentation CD for quick access to the *Official Red Hat Linux Reference Guide*, the *Official Red Hat Linux Reference Guide* and other reference material from the Linux Documentation Project.

As Linux evolves, so will the *Official Red Hat Linux Getting Started Guide*. In future editions, expect to find more essential information to help you get the most from your system.

We Need Feedback!

If you spot a typographical error in the *Official Red Hat Linux Getting Started Guide*, or if you've thought of a way to make this manual better, we'd love to hear from you! Please submit a report in Bugzilla (<http://www.bugzilla.com>) against the component rhl-gsg.

Be sure to mention the manual's identifier:

```
rhl-gsg(EN)-7.1-Print-RHI (2001-03-08T15:20-0500)
```

If you mention the manual's identifier, we will know exactly which version of the guide you have.

If you have a suggestion for improving the documentation, try to be as specific as possible when describing it. If you have found an error, please include the section number and some of the surrounding text so we can find it easily.

Sign Up for Support

If you have an official edition of Red Hat Linux 7.1, please remember to sign up for the benefits you are entitled to as a Red Hat customer.

Depending on which Official Red Hat Linux product you purchased, you can receive any or all of the following benefits:

- Official Red Hat support — Get help with your installation questions from Red Hat, Inc.'s support team.
- Red Hat Network — Use Red Hat Network to automatically retrieve and install system and security updates, as well as other packages.
- *Under the Brim: The Official Red Hat E-Newsletter* Red Hat Linux Every month, get the latest news and product information directly from Red Hat.

To sign up, go to <http://www.redhat.com/apps/activate>. You will find your Product ID on the black, red and white registration card in your Official Red Hat Linux box.

And for even more support, go to <http://www.redhat.com/support/> where you'll find plenty of information on documentation, support programs, updates, and more.

Good luck and enjoy your new Red Hat Linux system!

The Red Hat Documentation Team

Part I The Basics

1 Getting Started

Learning how to work on your Red Hat Linux system can be exciting, but it might also make you nervous. To begin your journey, you will have to log in. When you log in, you are basically introducing yourself to the system.

Linux is Case Sensitive

Like UNIX, Linux is case sensitive. That means that typing "root" refers to a different account than "Root". As far as Linux is concerned, the lowercase "root" refers to the root login, or system administrator.

When you installed Red Hat Linux, you had the opportunity to install the X Window System (also simply called X), which provides the display of graphical information. You were also asked whether you wanted to use a graphical screen, rather than a console (or shell prompt) to log in. A graphical screen has icons, lots of menus, and is generally more approachable for a new user. A console, or shell prompt, resembles an MS-DOS screen and requires the use of specific phrases or commands, which the user types at the command line. Although our emphasis throughout this book will be on navigation and productivity using X, we will cover both the graphical and console methods of logging in and starting the X Window System.

1.1 Logging In

Unlike some other operating systems, your Red Hat Linux system uses accounts to manage privileges, maintain security, and more. Not all accounts are created equal: some accounts have fewer rights to access files or services than others.

If you have already created a user account, you can skip ahead to Chapter 2, *The GNOME Desktop Environment*. If you created only the root account, read on to learn how to set up a user account.



Because your Red Hat Linux system creates the root account during installation, some new users are tempted to use only this account for all their activities. This is a bad idea. Since the root account is allowed to do anything on the system, you can easily damage your system by mistakenly deleting or modifying sensitive system files. You may be tempted to forego creating and using a user account during or after installation, but this is risky.

1.1.1 Logging In As Root

Regardless of whether you've chosen a graphical or console login screen, you'll have to supply a login account name and the password associated with that account.

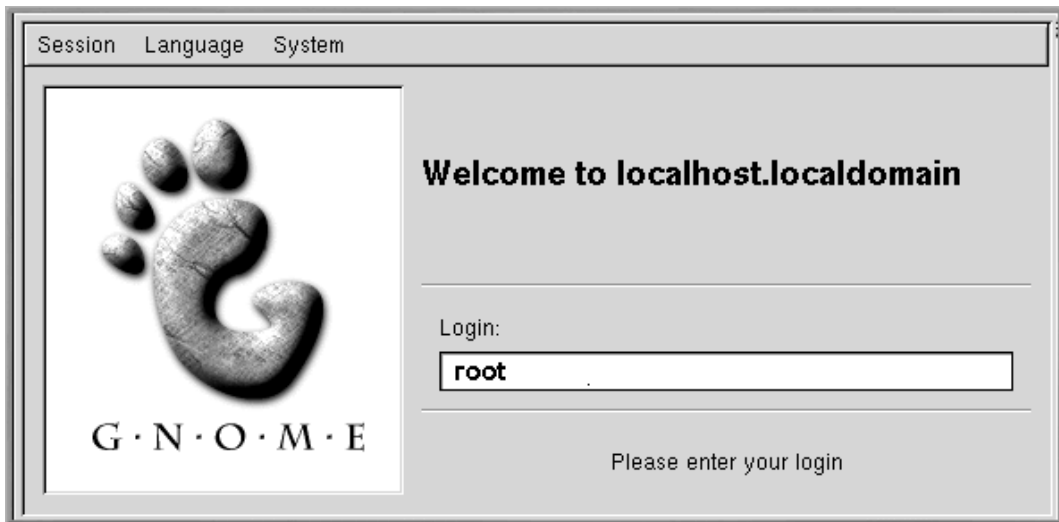
From a shell prompt, for example, you'll see something like:

```
Red Hat Linux release 7.0
Kernel 2.xx on an i686
localhost login:root
Password:yourrootpassword
```

Unless you've chosen to give your machine its own **hostname**, which is primarily used in a network setting, your machine will probably be called **localhost**.

To log in to the root account, type **root** at the login prompt and press [Enter]. Then type the root password you chose during installation at the password prompt and press [Enter].

Figure 1–1 The Graphical Login Screen



If you see a shell prompt (instead of the graphical desktop) you can start the X Window System by typing **startx** as follows:

```
[root@localhost /root]# startx
```

Changing Your Login Screen

To find out how you can change from a console to a graphical login screen see Section 13.14, *Changing Login from Console to X at Startup*.

Once you start the X Window System, you will find a desktop similar to Figure 1–2, *A GNOME Desktop* in GNOME or Figure 1–3, *A KDE Desktop* in KDE.

Figure 1–2 A GNOME Desktop

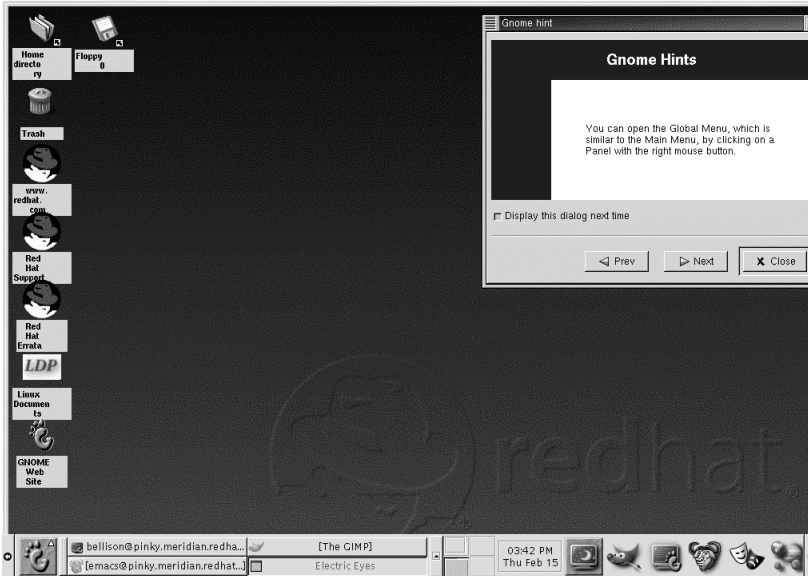
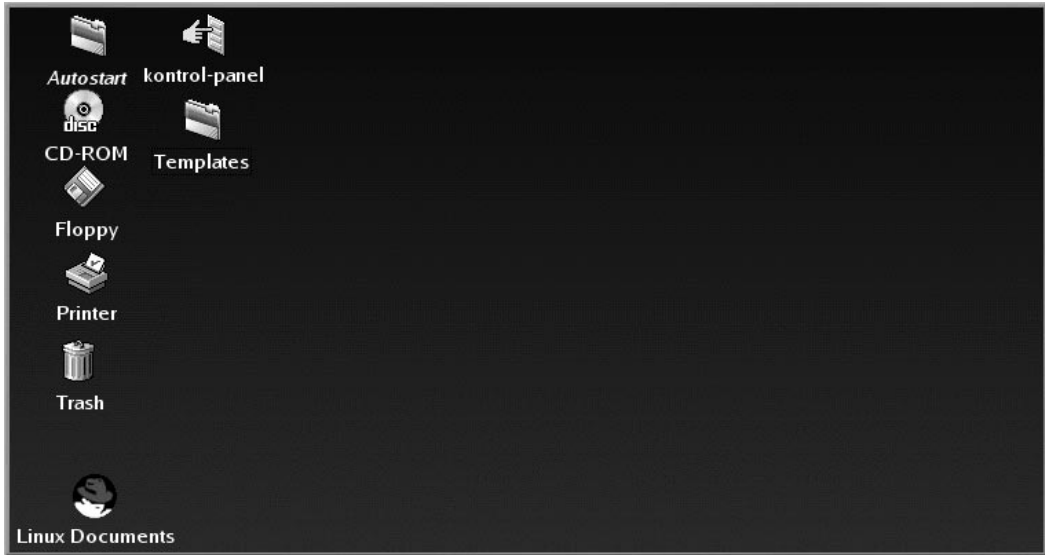


Figure 1–3 A KDE Desktop



1.1.2 Opening a Terminal Window

You must open a shell prompt to create a user account. Both GNOME and KDE offer quick launch buttons on their panels to open a shell prompt.

Figure 1–4 The GNOME Panel

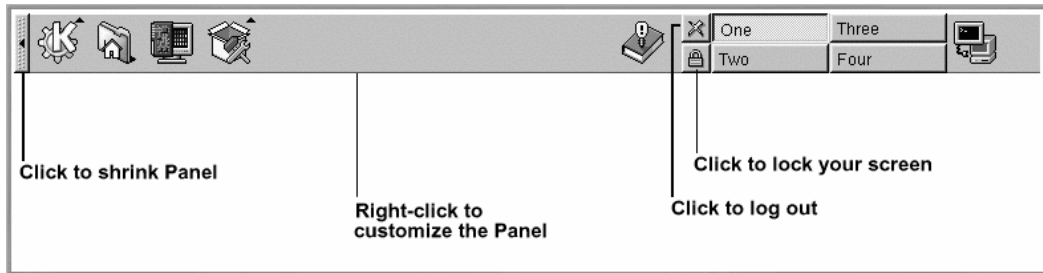


On the GNOME panel, the button which launches a shell prompt appears near the center and looks



You can also find launchers for shell prompts in GNOME, under **Main Menu=>System=>GNOME terminal** or **Regular Xterm**.

Figure 1–5 The KDE Panel



Similar to GNOME, the KDE panel prominently features a quick launch button for a shell prompt.



The launcher looks like:

You can also find the launcher from the KDE main menu under **Utilities=>Konsole** or **Terminal**.

1.2 Creating a user account

When you installed Red Hat Linux, you were asked to create a root password — a password for the root account, which is used by the system administrator. At that time, you were also able to create additional user accounts.

If you did not create a user account during the installation, this should be your first task. There are two ways to do this: from a GUI (using `linuxconf`) and from a shell prompt.

To create a user account from a GUI:

1. Log in from the console or from a graphical screen.
2. Open a terminal window. In GNOME and KDE you can click on the **Terminal Emulation** icon on the panel at the bottom of the desktop. If you are working without a GUI, you are already at a shell prompt.
3. Type `su -` at the command line and press [Enter] to log in as root. You will then be asked to enter the root password.
4. Type `linuxconf` at the command line and press [Enter]. You will get a help screen the first time you open `linuxconf`. Click on **Quit** to see the `linuxconf` screen.
5. Click on the **+** next to **Users Accounts** to expand this menu.
6. Click on the **+** next to **Normal**.

7. Click on **User Accounts**.
8. In the **Users Accounts** window that appears on the right, click on **Add**.
9. Fill in the login name you want this user to have and the user's full name in the appropriate fields. Every account belongs to at least one group. Groups are used to determine file access permissions. The default group for a user account will be the same as the login name.
10. Fill in any other fields you choose to and click on **Accept**.
11. Enter a password for the new user (read on in this chapter for more on selecting user names and passwords). You will be asked to re-enter it for confirmation.

The new user should now appear in the list of users. You can delete accounts in `linuxconf` by selecting a user from the **User Accounts** list and then clicking on the **Del** button. To edit account info, select an account from the **User Accounts** list, change the fields you want to, and click on **Act/Changes**.

For more information on advanced `linuxconf` functions, click on the **Help** buttons in `linuxconf`.

To create a user account from a shell prompt:

1. At the shell prompt, log in as root.
2. Type `useradd` followed by a space and the username for the new account at the command line and press [Enter].
3. Now type `passwd` followed by a space and the username again.
4. The shell prompt should display `New UNIX password`. This is asking you to type the password for the new account.
5. Type the password again for confirmation. You will see the following message, indicating that the new account has been created:

```
passwd: all authentication tokens updated successfully
```

Choosing Account Names

Often, user accounts are just variations on the user's name, such as `jsmith` for John Smith. User account names can be anything from your name, initials, or birthday to something more creative.

What is a Secure Password?

You can be fancy or plain when you pick a user account name, but take precautions when you choose a password. The password is the key to your account, so it should be both unique and easy for you to remember. Your password should be at least six characters (actually, it can be 256 characters long if you enabled MD5 passwords during the installation, though you probably don't need that many). You can mix upper- and lowercase letters, as well as numbers and characters. Avoid easy selections, such as "qwerty" or "password." If you want to pick an easy-to-remember but somewhat unique password, consider a variation of a word, such as "a!rP18nE" for "airplane." If you need more information about passwords, see Chapter 10, *Shell Prompt Basics*.

You can exit from a terminal window by clicking the **X** button on the upper right corner of the window, or by typing **exit** at the prompt.

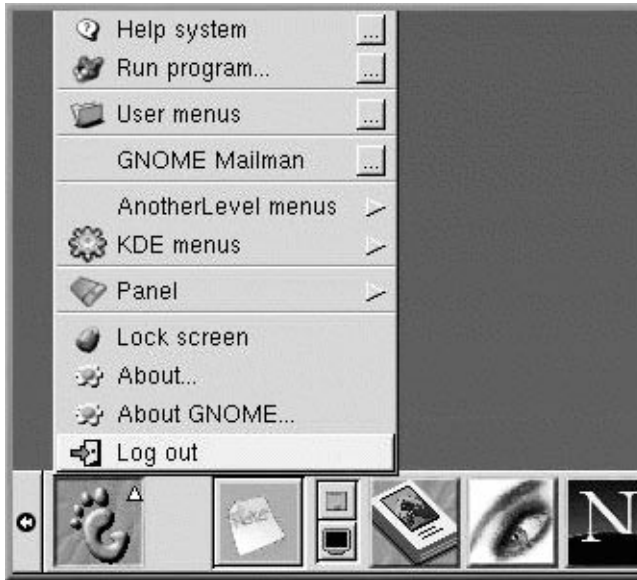
Forgot Your Password?

See (Section 13.11, *Forgotten Password*) for information on what to do if you forget your root or user account password.

1.3 Logging Out of Root

Now, you should log out of the root account and log in to your user account.

To log out from GNOME, click once on the **Main Menu Button** on the panel and drag your cursor to the first item, labeled **Log out** (as shown in Figure 1–6, *The Log out Selection*).

Figure 1–6 The Log out Selection

When the confirmation dialog appears (see Figure 1–7, *Logout Confirmation*), select the **Logout** option and click the **Yes** button. If you want to save the configuration of your panel, as well as any programs which are running, check the **Save current setup** option, as well.

Figure 1–7 Logout Confirmation

Similarly, in KDE, you can log out from the **Main Menu** button on the panel.

By default, the panel in KDE also contains a quick launch button to log out; it is located near the



taskbar, at the center of the panel, and looks like:

You will either return to the graphical login screen or the shell prompt, depending on how you chose to log in.

If you are returned to a non-graphical shell prompt, just type **exit** at the prompt:

```
[root@localhost /root]# exit
```

Another Way to Log Out

You can log out of the root account either by typing **exit** or by using the key combination of [Ctrl]-[D].

Now, you can log into your user account the same way you logged in as root.

2 The GNOME Desktop Environment

GNOME is a flexible and user-friendly way to use a graphical user interface with Red Hat Linux.

In this chapter, you will get acquainted with the fundamentals of GNOME. In later chapters, you'll find greater detail about tasks such as connecting a printer and setting up your Internet account using GNOME tools.

You'll find the latest GNOME-related information at the the official GNOME website: <http://www.gnome.org>.

If You Want To Use GNOME and KDE Applications

If you have both GNOME and KDE on your system, you can often use applications from the other environment. For example, you can use the KDE email client, KMail, even if you're working in GNOME.

2.1 Using Your Mouse

Using the left mouse button selects an item to open or drag to another location. If you hold down the left mouse button while you drag the cursor over items, you can select multiple items on the desktop.

Make a Two-button Mouse Act Like a Three-button Mouse

A three-button mouse offers the greatest flexibility in GNOME. If you have a two-button mouse, however, and you selected three-button emulation when you installed Red Hat Linux, simply hold down both left and right mouse buttons at the same time to get the effect of a middle mouse button.

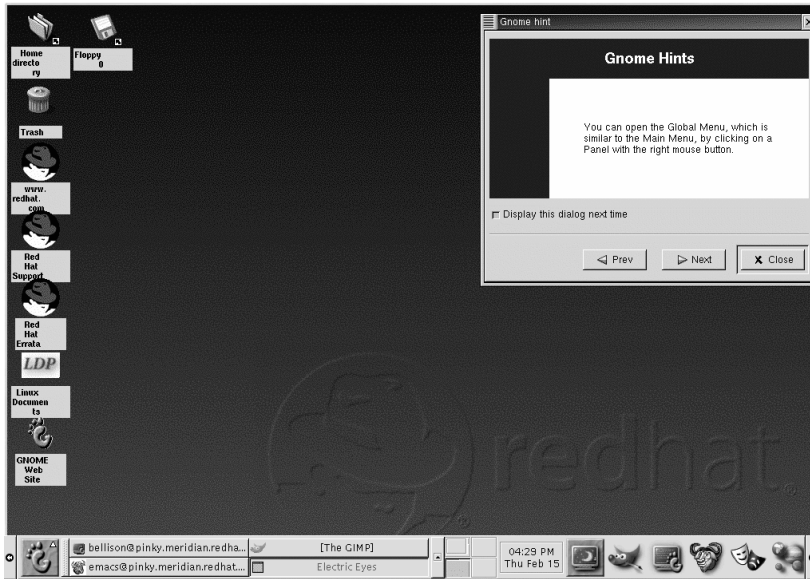
Pressing the middle button of your mouse on the desktop will reveal a GNOME applications menu, help menus, and configuration menus for *sawfish*, the default GNOME window manager.

Using the right mouse button reveals a menu of actions which you can take. Right-clicking on the desktop shows you options such as adding desktop items, customizing the background, and more. Right-clicking on a folder or application reveals a menu related to actions related to to your selection, such as deletion, properties, and more.

2.2 The Desktop

Your first view of GNOME will look something like Figure 2–1, *A GNOME Desktop*.

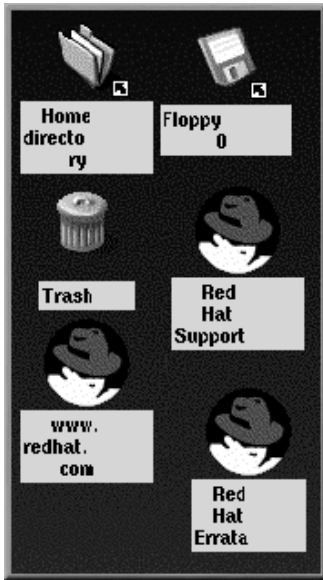
Figure 2–1 A GNOME Desktop



The GNOME environment is called a desktop. This is the area where you have application launchers, document windows, lists of files (folders), and so on.

The long bar across the bottom of the desktop is known as the panel. The panel displays application launchers and status indicators, such as the current time, minimized applications you are running, and more.

The icons elsewhere on the desktop can be file folders or application launchers. To open a folder or launch an application, double-click on its icon.

Figure 2–2 Folders and Launchers on the Desktop

Mounting a Device

Ordinarily, you can use your drives just by clicking on them. Most devices are now mounted automatically. But occasionally you may get an error message, telling you a device needs to be mounted. When you mount a floppy or CD-ROM, you're making that device's contents available to you. For example, to mount a CD-ROM, type the following command at a shell prompt:

```
mount /dev/cdrom /mnt/cdrom
```

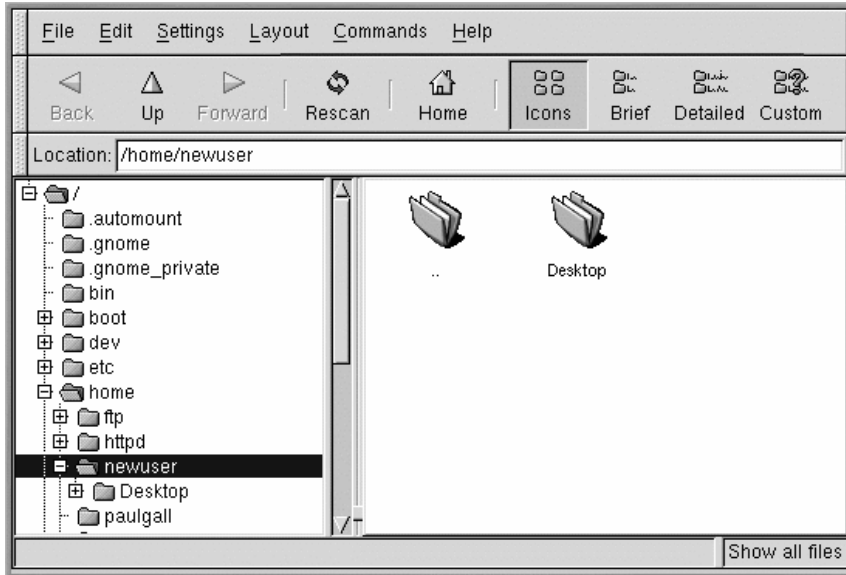
This command tells the system which device (/dev/cdrom) to mount and where to mount it (on the /mnt/cdrom directory).

2.3 Folders

Your default desktop includes a folder showing you the contents of your /home directory (see Figure 2–3, *Contents of an Open Folder*). You can specify different ways to view the contents of your /home

and other directories on your system. In general, however, the left pane of the file manager shows you the directory tree while the right pane shows you the contents of that directory.

Figure 2–3 Contents of an Open Folder



You can start the file manager by double-clicking on a folder on your desktop or from the main menu, under **File Manager**.

What is a File Manager?

GNOME's file manager is an application called the GNU Midnight Commander, or GMC. GMC is GNOME's version of the popular Midnight Commander file manager. You can find more about the File Manager later in this manual or from the *GNOME User's Guide* at the <http://www.gnome.org>.

2.4 The Panel

Like much of GNOME, the panel is highly configurable (see Figure 2–4, *The Panel at the Bottom of the Desktop*).

From the panel, you can launch applications and applets (small applications and utilities which are meant to be docked into the panel). Among the applets already running on the panel are the **GNOME Pager** and clock applet. Click on the **Main Menu** button and go to **Applets** to see the available applets.

You can hide the panel by clicking on one of the arrows at either of its borders. You can also auto-hide the panel, making it appear to sink beneath the frame of your screen (it will return when you hold your cursor over that spot). To enable the auto-hide feature, right-click on the panel and go to **Panel => Properties => Hiding policy => Auto hide**.

Elements of the GNOME Pager

The GNOME Pager consists of the Desk Guide, which is a visual representation of your desktops, and the Tasklist, which shows your running applications.

For more on the Desk Guide and GNOME Pager, see Section 2.7, *Multiple Desktops*.

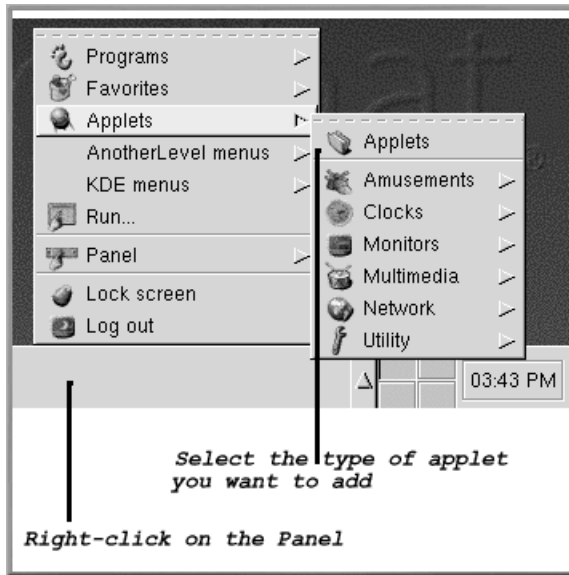
Applications, folders, and applets can be docked on the panel, so that they can be launched with a single click of the button.

Figure 2–4 The Panel at the Bottom of the Desktop



To add an applet, do one of the following:

- Right-click on the panel; select **Applets** and choose from the list of applets (see Figure 2–5, *Adding an Applet*).
-

Figure 2–5 Adding an Applet

- Right-click on the panel; select **Panel** => **Add to panel** => **Applets** and choose from the list of applets (see Figure 2–6, *Adding an Applet*).

Figure 2–6 Adding an Applet



- Choose **Applets** from the Main Menu button and choose from the list of applets.

You can also customize the panel, add more than one panel to your desktop, or convert the current orientation of the panel from horizontal to vertical. By clicking on the arrows which appear at either end, you can shrink the panel to appear in a corner of the Desktop, rather than extend across the screen (as in Figure 2–4, *The Panel at the Bottom of the Desktop*).

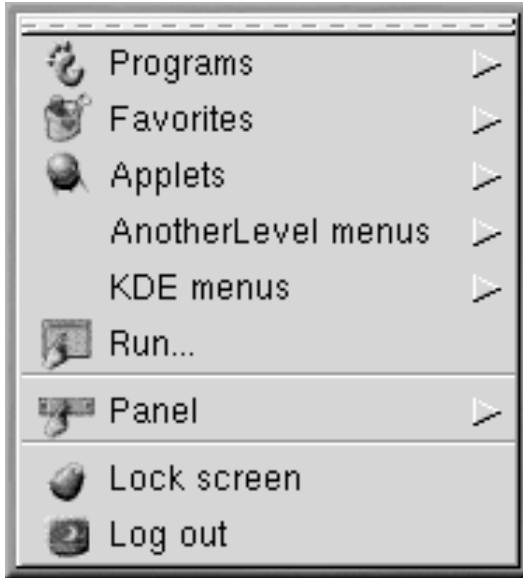
To customize your panel, right-click on the panel, select **Panel** => **Properties**, and choose from the list of customizing options.

Switch Tasks Quickly

One way to bring currently running applications to the front is to press [Alt]-[Tab]. To scroll through the tasks, hold down the [Alt] key, while pressing the [Tab] key in succession. When you've found the task you want to bring to the front, stop pressing the [Tab] key and release the [Alt] key.

2.5 Main Menu Button

The stylized GNOME footprint on the panel is the **Main Menu Button**. Left-click on the button, and you'll see a menu similar to Figure 2–7, *The Expanded Main Menu*.

Figure 2–7 The Expanded Main Menu

From here, you can start all the included applications and applets for GNOME; you also have access to KDE applications, under **KDE menus** (if KDE is installed on your machine).

These submenus give you access to a full range of applications on your system. If you prefer to use the GNOME environment, but would like to use some non-GNOME applications, you can easily choose them from the **Main Menu Button**.

From the **Main Menu Button**, you can also log out, run applications from a command line, and lock your screen, which runs a password protected screensaver.

2.6 Finding Help

The GNOME Help Browser (see Figure 2–8, *The GNOME Help Browser*) is a useful utility. Since this application displays not only GNOME-related help but also info pages and man pages, the GNOME Help Browser can be an invaluable resource for learning about both GNOME and your Red Hat Linux system. (Info pages and man pages are concise help documents which are usually installed on a Linux system. See the introductory chapter, *Introductory Terms*.)

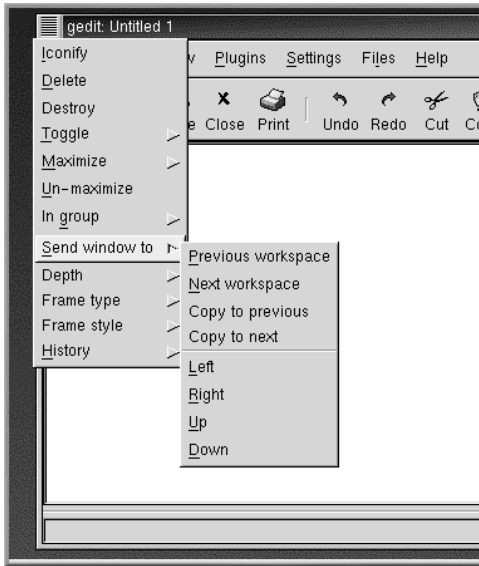
Figure 2–8 The GNOME Help Browser

You can open the GNOME Help Browser by double-clicking on its launcher on the desktop or by going to **Main Menu => Help System**.

2.7 Multiple Desktops

Instead of crowding your work on to one screen, you can use virtual desktops, which extend your workspace to multiple desktop areas. For example, you may have your browser open on one desktop. If you want to use a word processor and email program without having them all be on top of each other, you can have each application run on its own desktop.

Figure 2–9 Moving an Application to Another Desktop



By default, four desktops are available to you. However, using the configuration utility for your window manager, you can modify that number. To run **sawfish**'s configuration program, middle-click on your desktop (or click your right and left mouse buttons simultaneously), and select **Customize**. Go to the entry called **Workspaces** to increase or decrease the number of available desktops. You can also go to **Main Menu => Settings => GNOME Control Center => Sawfish window manager => Workspaces**.

In the **Workspaces** field, use the arrows or enter a number manually to determine the number of workspaces. You can name the Workspaces by clicking on **Insert** and typing a name in the pop-up box that appears.

The numbers in the **Columns** and **Rows** fields are multiplied by the number in the **Workspaces** field, increasing your number of workspaces, if you choose, and determining the appearance of your Desk Guide. Enter different numbers in these fields and click on **Try**. Watch the display in the Desk Guide on your panel change as you do this.

You can move a window from one desktop to another by clicking on the title bar and dragging it over any border of your current screen, or by clicking on the top left corner of any open application and selecting **Send Window To** from the menu that appears.

Figure 2–10 The GNOME Desktop Guide

The Desk Guide (see Figure 2–10, *The GNOME Desktop Guide*) is a GNOME utility which allows you to switch desktops (or workspaces) by clicking on the corresponding desktop.

Parts of the Pager

The Desk Guide is one part of the GNOME Pager; the other part of the Pager is the Tasklist. You can add new Tasklists, Pagers, or Desk Guides by right-clicking on the panel and moving your cursor to **Add applet => Utility** and selecting the applets from the menu.

2.8 Switching Environments

In addition to changing your graphical environment at the login screen, you can switch to another environment when you're already logged in.

You can change environments by using the Switchdesk utility (see Figure 2–11, *The Switchdesk Utility*). Whether you're using GNOME or KDE you can select your new environment in Switchdesk and log out. When you restart your session, you'll find your new environment.

Additional Environments

If you performed a workstation install, the Switchdesk utility will show options for GNOME, KDE, and another environment called TWM. Custom installations may display even more options.

Figure 2–11 The Switchdesk Utility

There are several ways to start Switchdesk:

- Go to **Main Menu Button** => **Programs** => **System** => **Desktop Switching Tool**.
- Dock a **switchdesk** applet on your panel, as discussed previously in this chapter (see Section 2.4, *The Panel*).
- Type **switchdesk** at the shell prompt.
- Open the Run program item from the **Main Menu Button** and type **switchdesk** in the window.

Your changes won't be reflected immediately. Instead, you'll have to log out of your current X session. The next time you start X, you'll work in your new environment.

2.9 Quitting from GNOME

When you log out, GNOME allows you to simply log out (and leave the system running), restart, or halt the system completely.

Figure 2–12 The GNOME Log Out Confirmation

To log out from the **Main Menu** on the panel, click on the **Main Menu Button** and select **Log out**.

In the confirmation dialog which opens (see Figure 2–12, *The GNOME Log Out Confirmation*), you can choose to:

- **Logout** — logs you out of your account and returns you to the login screen, leaving the system running.
- **Halt** — logs you out of your account and shuts down the system. To restart after you halt, press [Ctrl]-[Alt]-[Del] or push the reset button on your computer.
- **Reboot** — logs you out of your account and restarts the system.

Select any of the options and click on the **Yes** button to continue. Also, select the **Save current setup** option if you want to save your session. Saving your session will preserve your current configuration of the panel and save the programs you might have open.

If you don't wish to proceed, click on the **No** button to continue with your GNOME session.

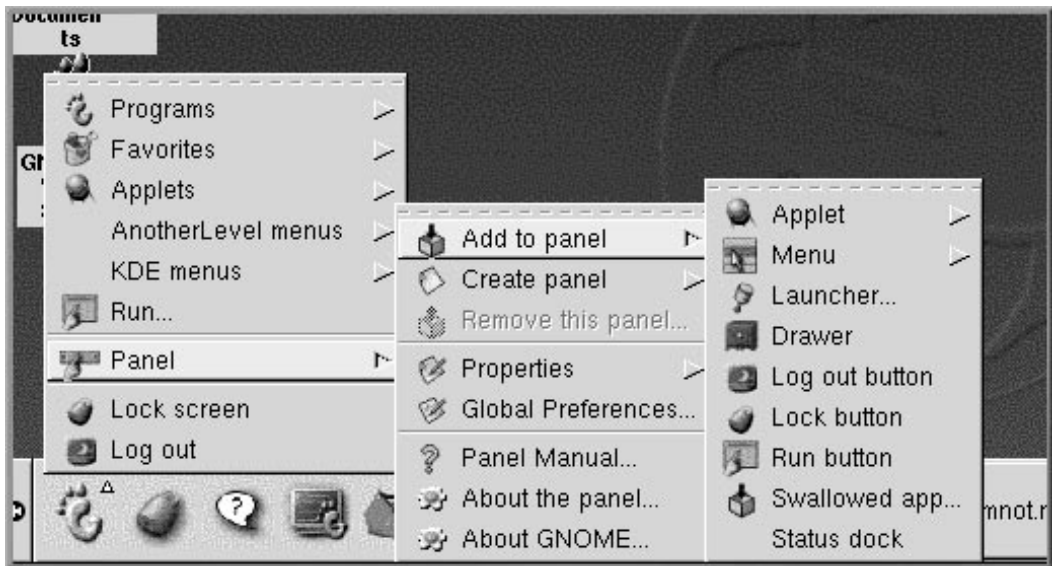
Typing Your Password

When you select either **Halt** or **Reboot**, you'll be asked for your account's password before proceeding. In the space provided, just type in the password you used when you logged in for your current session.

2.10 Adding a Log Out Button

You can add a quick launch **Log out** button to the panel.

Figure 2–13 Adding a Log Out Button



To add the button to your panel, go to **Main Menu** => **Panel** => **Add to panel** and click on **Log out button** (see Figure 2–13, *Adding a Log Out Button*). Now, when you want to log out, just click on this button.

2.11 Shutting Down from the Run Program Menu

An additional way to shut down or restart your machine is to select the **Run program** item from the **Main Menu** and, in the dialog which opens, type `shutdown -r now` or `shutdown -h now`. The `-r` means reboot, and will restart your machine; the `-h` means halt, and will shut down the system.

2.12 Shutting Down at the Shell Prompt

Like the **Run program** option in GNOME, you can use the `shutdown` command to halt or restart your system from a shell prompt, whether you're working in GNOME, KDE, or the non-graphical environment.

To halt or restart your system from a shell prompt:

- To see a shell prompt, from the panel, click on the **Terminal Emulation** or **Console** launcher.
- At the shell prompt, type `shutdown -r now` or `shutdown -h now` and enter your user account password in the dialog box that appears. The `-h` means halt and will shut down the system; the `-r` means reboot and will restart the system.
- In console mode, type `shutdown -r now` or `shutdown -h now` and enter your user account password after the `Password` prompt.

Make certain that you've saved your work before halting or restarting your system from the shell prompt. Running applications will be closed and you won't have the option of saving your work or your session.

Restarting an X Session

If you're having difficulty quitting your X session, (for example, if you get no response when you click on the **Log out** button in KDE) you can swiftly end the X session and return to the login screen by pressing the [Ctrl]-[Alt]-[Backspace] keys. This procedure should be used only as a last resort, however. *Make sure you close your running applications and save your work before logging out this way!*

More About Shutting Down

You can specify the delay between when you issue the **shutdown** command and its execution. Replace the word now with a "+" and a number; for example **shutdown -h +5** will shutdown and halt the system after five minutes have passed.

3 The KDE Desktop Environment

Like GNOME, the KDE desktop environment is easy to navigate and highly configurable.

This chapter provides an overview of KDE fundamentals. Details, such as configuring your desktop, working with the file manager, and using specific KDE tools, will be covered in later chapters.

For the latest documentation on KDE, visit the project's website: <http://www.kde.org>.

Using Both GNOME and KDE

Certain applications can be used in both GNOME and KDE. For example, you can use the **Gnumeric** spreadsheet application in KDE, even though the application is part of the bundled GNOME applications.

3.1 An Overview of KDE

The KDE desktop contains applications, launchers, document windows, file folders, and so on.

The long bar across the bottom of the desktop is the panel. The panel contains application launchers, status indicators, and the desktop manager. You can have up to 16 desktops running at the same time in KDE (for more information on this, see Section 3.6.1, *Multiple Desktops*). The taskbar appears at the top of the desktop and shows your currently running applications.

3.2 Using Your Mouse

Click Once on the Mouse in KDE

You start applications and open folders by clicking just once on the associated icon.

Making a Two-Button Mouse Emulate a Three-Button Mouse

A three-button mouse offers the greatest ease of access to menus and navigation in KDE. If you have a two-button mouse and you selected three-button emulation during the installation of Red Hat Linux, simply hold down both the left and right mouse buttons at the same time to emulate the middle button of a mouse.

You can switch desktops with the mouse by placing the cursor in the desktop and pressing the middle button of your mouse. Select the desktop you want from the pop-up menu that appears.

Use the right mouse button to reveal a brief menu of desktop related actions.

Right-clicking on a folder or application reveals a menu related to actions you can take with your selection, such as moving the item to the **Trash**, revising the item's properties, and more.

3.3 Drag and Drop

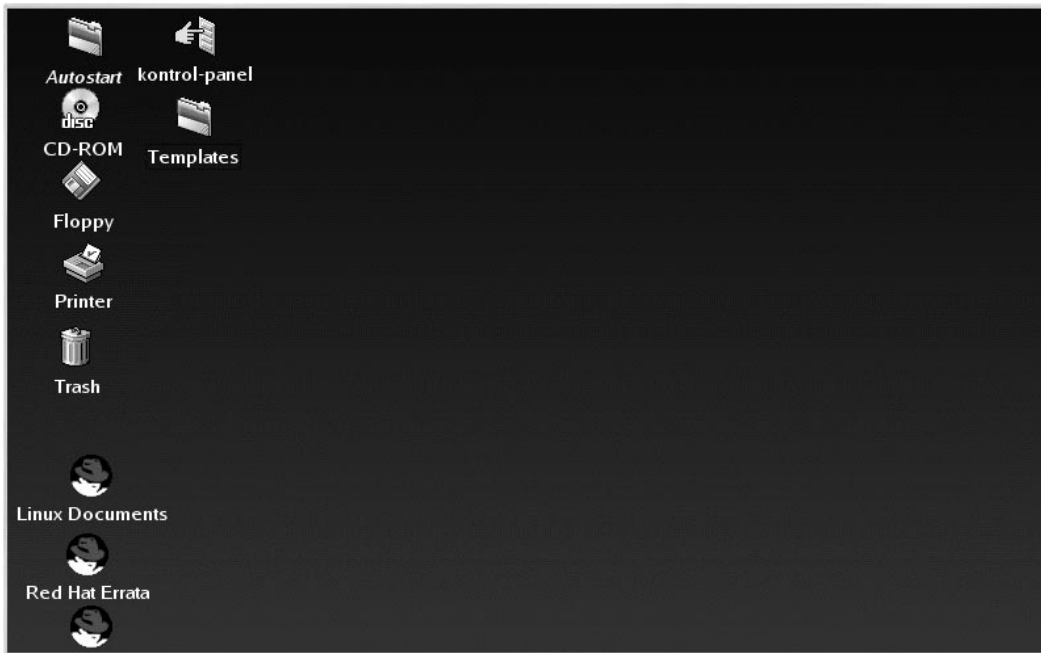
You can drag and drop items in KDE from one area of the desktop to another, drop items in folders or on applications, and move or copy information and applications.

When you drag an item by holding down the left mouse button, then release the button over the desired location, you'll find a menu of actions you can take. You can copy the item into the location (which will preserve the original item), you can move the item to its new location, or you can create a link from the item in its new location to the original item. This last option is somewhat similar to copying; however, when you copy the item, the original item remains unchanged if you modify the copy. When you link an item, any changes you make to the item in one location are reflected in the item at its original location.

You can also drag applications, such as Netscape Navigator, from the desktop and drop them onto the panel, creating a quick launcher. To remove an item from the panel, right-click on the item, and select **Remove**. Removing an application from the panel will only remove the link and icon, not the actual application.

3.4 The Desktop

When you first start KDE, your desktop will look something like Figure 3-1, *A Typical KDE Desktop*.

Figure 3–1 A Typical KDE Desktop

Customize Your Desktop

You can customize the look of your desktop with preferred colors or pictures, or using themes. To learn more about themes in KDE, visit the KDE website (<http://www.kde.org>).

3.4.1 The Trash, Printer, and Drives

Your desktop contains, among other things, icons representing your **Printer**, **CD-ROM**, **floppy** drives, and **trash** (see Figure 3–2, *Drives, Trash, and Printer Icons*).

Figure 3–2 Drives, Trash, and Printer Icons

The icons for **floppy** and **cdrom** provide shortcuts to those devices. You can access either of these devices by left-clicking once on one of the icons.

Diskette Formatting

If you place a floppy diskette in the drive, then select the **floppy** drive on your desktop, you may receive an error message such as `wrong fs type, bad option, bad superblock on /dev/fd0` or other.

Most likely, the diskette you've placed in the drive is not formatted with the `ext2` filesystem, the Linux filesystem format. For more information about how to access a diskette that is not formatted for Linux, as well as about the `ext2` filesystem, see Section 13.1, *Using a Diskette*.

When you right-click on the drive icons, you will see several options for working with these drives, such as **Delete**; **Move to Trash**, which will remove the icon from your desktop (you probably won't want to do this); **Copy**, which allows you to copy the icon to another location; **Open with**, which you should probably avoid for now; and **Mount**.

Mounting a Device

Ordinarily, you can use your drives just by clicking on them. Most devices are now mounted automatically. But occasionally you may get an error message, telling you a device needs to be mounted. When you mount a floppy or CD-ROM, you're making that device's contents available to you. For example, to mount a CD-ROM, type:

```
mount /dev/cdrom /mnt/cdrom
```

This command tells the system which device (`/dev/cdrom`) to mount and where to mount it (the `/mnt/cdrom` directory).

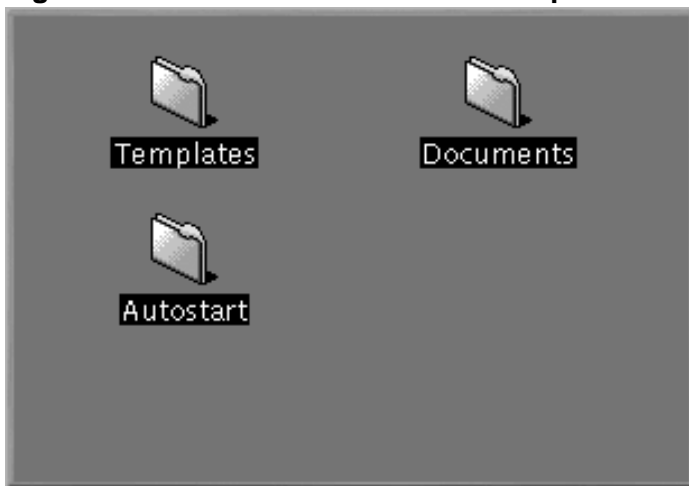
You can drag and drop your unwanted items to the **Trash** icon. Right-click on the trashcan and select **Empty Trash Bin** to delete the items from your system.

The **Printer** shows you the print queue, meaning the jobs which are printing or scheduled to print. This is a handy tool for monitoring the progress of your printing tasks.

3.5 Folders

When you first start KDE, you'll see file folders on your desktop. Among the more important folders are **Templates** and **Autostart** (see Figure 3–3, *File Folders on the Desktop*).

Figure 3–3 File Folders on the Desktop

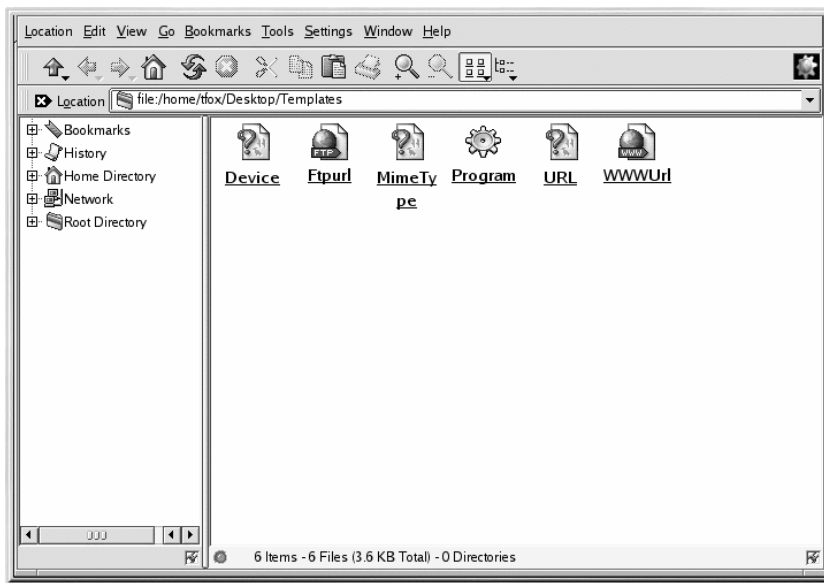


To open a folder, single-click on it with your left mouse button.

You can drag and drop applications to the **Autostart** folder and they will start automatically each time you begin a KDE session.

In the **Templates** folder, you'll find basic file types that you can drag onto your desktop or into other folders and customize to suit your needs (see Figure 3–4, *A View of the Templates Folder*).

Figure 3–4 A View of the Templates Folder



Available templates include:

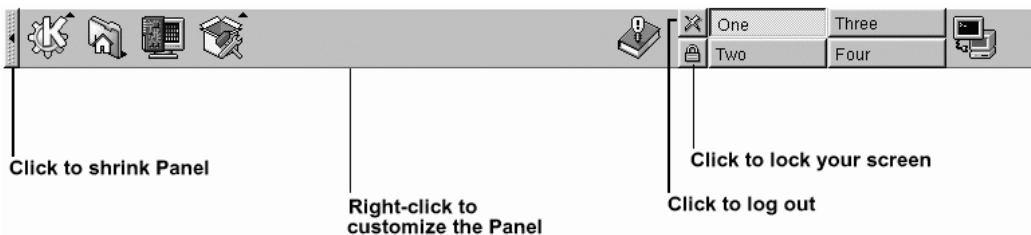
- **Ftpurl** — Creates a link to FTP sites. (FTP stands for File Transfer Protocol, a method of transferring files over the Internet or other networks.) Single-click on the link to access the site.
- **Mime Type** — Creates a link to an application or text file. (MIME means Multipurpose Internet Mail Extensions; they're used to describe different data so that the operating system knows how to work with it when that data is selected.) You won't need this template often, since many MIME types are already available with KDE.
- **Program** — Creates a link to start a program.
- **URL** — Creates a link to a favorite website, like a detachable bookmark.

To use these templates, left-click on your chosen template and drag it to your desktop or into another folder. You can then customize it with the appropriate name and information (right-click, select **Properties**, and change fields as you choose).

3.6 The Panel

The panel stretches across the bottom of the desktop.

Figure 3–5 The Panel



The panel is very configurable. You can add and remove applications and applets, which will allow you to access them easily. Right-click on the panel and select **Settings** to open the **KPanel Control Module**. Go to the **General** tab for panel placement and appearance options.

You can hide the panel by choosing to auto-hide it, making it appear to sink beneath the lower frame of your screen (it will return when you hold the cursor over the bottom edge of your screen). You can also hide the panel by clicking on one of the arrows on either of its borders.

Other tabs in the **KPanel Control Module** have options to further customize your panel. Click on **Help** for more information.

Applications and utilities can easily be added to the panel. To add an application to the panel, right-click on the panel and go to **Add**. Then select **Button**, **Applet**, or **Extension** and make your choice from the corresponding menu. Once your choice is highlighted, release the mouse button and the item will be added to the panel.

3.6.1 Multiple Desktops

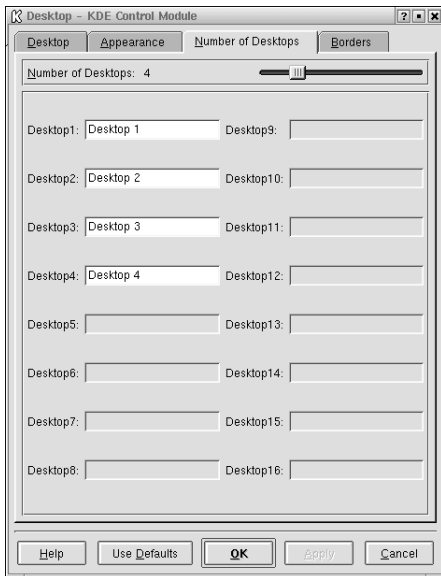
By default, KDE provides four desktops on which you can spread your work. Each desktop can hold icons, open applications, and have individually customized backgrounds.

For example, while you're writing email on the first desktop, you can have Netscape Navigator running on desktop two, a word processor open on desktop three, and so on.

You can change the number and names of desktops available in KDE. To make these adjustments:

1. Right-click on the desktop; you'll see a limited menu of actions you can take.
2. Select **Configure Desktop**; the KDE panel configuration tool will open.
3. Click on the **Number of Desktops** tab (see Figure 3–6, *The Desktops Tab in the Panel Configuration*).

Figure 3–6 The Desktops Tab in the Panel Configuration



1. To change the names of your desktops, from **One**, **Two**, and so on, replace the default names with your preferred names in the appropriate boxes (see Figure 3–6, *The Desktops Tab in the Panel Configuration*).

You can increase (or decrease) the number of desktops available to you by adjusting the **Visible** slider of the **Desktops** dialog. For more desktops, drag the bar to the right; for fewer desktops, drag the bar to the left. The **Desktop**, **Appearance**, and **Borders** tabs are where you can make various desktop configuration selections, like icon arrangement and font size.

Buttons for your desktops appear on the panel in the Desktop Pager. Click on the buttons to move among your desktops. Alternately, you can use the **Windowlist** applet to navigate your desktops. If the **Windowlist** icon is not on your panel, you can add it by right-clicking on the panel and selecting **Add => Windowlist**.

Switch Desktops Quickly

You can use the keyboard combination of the [Ctrl] and Function keys to switch desktops. For example, [Ctrl]-[F2] will switch you from desktop one to desktop two, [Ctrl]-[F3] will take you to desktop three.

3.7 The Main Menu K Icon

The main menu in KDE, (the **K** icon), incorporates all of the available KDE applets and applications, as well as many other applications on your Red Hat Linux system.

You can find the icon on the left of the panel. You open the main menu by clicking once on the icon. You'll see the top level of menu headings first. These headings are the major groups into which the applications are placed. For example, to open KOrganizer, the KDE calendar and appointment book, you would open **Main Menu K**, drag your mouse to highlight the **Applications** menu listing, then highlight and click once on the **Organizer** entry in the submenu which opens.

From the **Main Menu**, you can also access:

- The KDE Control Center, an invaluable resource for customizing your environment and locating system information.
- A **Home Directory** listing which will open a browser showing you all the files in your home directory.
- The **Lock Screen** and **Logout** icons, which will password protect your desktop and allow you to log out of your account.

3.8 The Taskbar

The taskbar displays all running applications — both minimized and on the desktop (see Figure 3–7, *Applications on the Taskbar*).

Figure 3–7 Applications on the Taskbar



You can keep the taskbar running in a separate location from the panel or you can have them both located in the same place on the desktop. The default configuration places the taskbar at the top of the desktop while the panel runs at the bottom of the desktop. Right-click on the panel and select **Settings** to open the **Kpanel Control Module**. Make your placement selection under **Panel Location** on the **General** tab.

You can maximize running applications or bring them to the front of your working windows by clicking on the associated item on the taskbar.

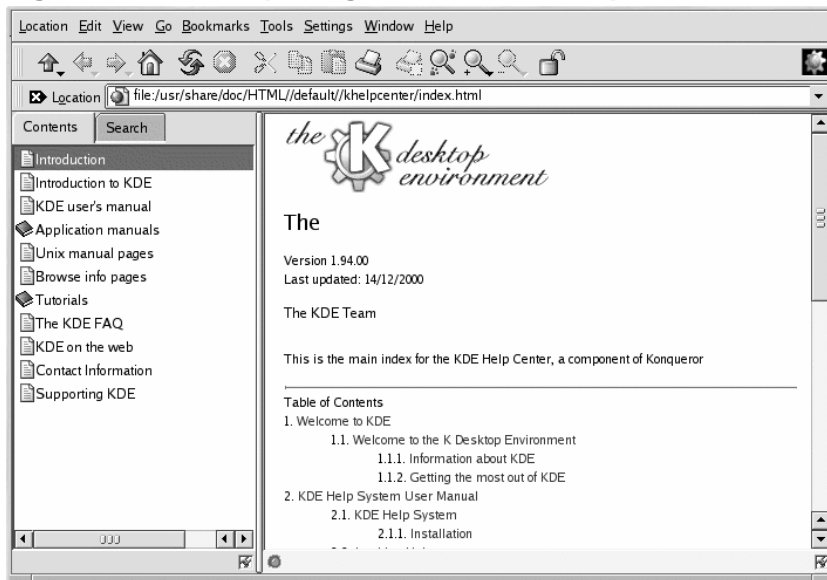
Switch Tasks Quickly

Another way to bring minimized or background windows to the front is to use the [Alt] and [Tab] keys. To pick an item from the taskbar, hold down [Alt]-[Tab]. To scroll through the tasks, hold down the [Alt] key, while pressing the [Tab] key in succession. When you've found the task you want to maximize and bring to the front, release both keys. This procedure works only on your current desktop, so if you've got applications running on other desktops, you'll have to switch to that desktop in order to maximize it with these keys.


3.9 Finding Help

KDE Help is the online help browser for getting the most out of KDE, as well as for many features of your Red Hat Linux system.

Figure 3–8 The Opening Screen of the Help Browser

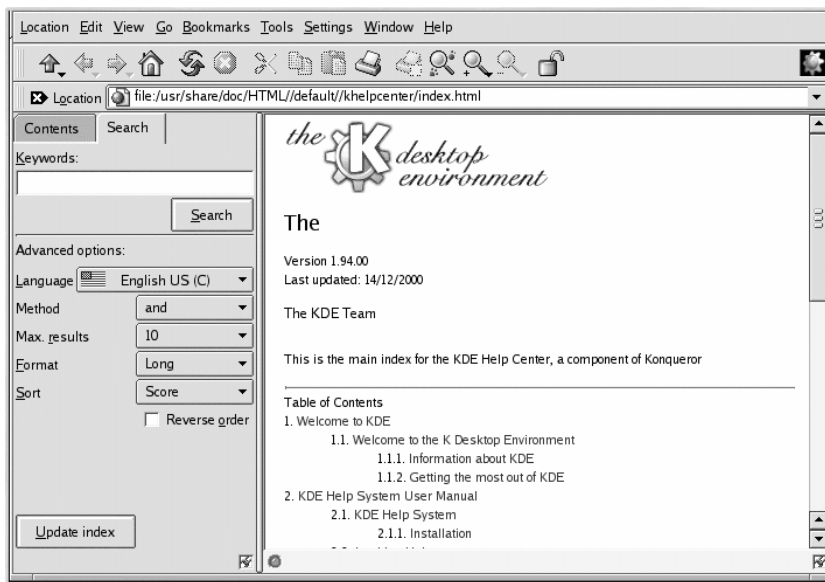


There are several ways to access KDE Help, but the easiest are:

- From the panel — A single click on the KDE Help icon, which looks like: 
- From the **Main Menu** — select **Help**.
- By right-clicking on the desktop and selecting the **Help on desktop** entry in the brief menu.

The opening screen of the KDE Help browser will appear like Figure 3–8, *The Opening Screen of the Help Browser*. From this main page, you can view help documentation on using and configuring the desktop, working with Konqueror (the KDE file manager), and more.

Figure 3–9 The KDE Help Search Tool



On the search tab (see Figure 3–9, *The KDE Help Search Tool* for an example screen), type in the keyword, subject, or significant phrase for which you want help. Click on **Submit Search** or press [Enter] to begin searching.

3.10 Switching Environments

In addition to changing your graphical environment at the login screen, you can switch to another environment when you're already logged in. You can change environments using the **Switchdesk** utility (see Figure 3–10, *The Switchdesk Utility*). When you restart your session, you'll find your new environment.

Figure 3–10 The Switchdesk Utility



There are three ways to start **Switchdesk**. You can start the **Switchdesk** at a shell prompt. You can add a button to the panel that will open **Switchdesk** (go to **Main Menu** => **Configure Panel** => **Add Button** => **System** => **Desktop Switching Tool**). Or you can open **Run** from the main menu and type **switchdesk** at the prompt.

To open **Switchdesk** at a shell prompt:

- Type **switchdesk** at a shell prompt.
- Select your new environment and click **OK**.
- Close the terminal window by typing **exit**.
- Log out and log in again.

The next time you start your X session, you'll be in your newly selected environment.

Regardless of the process you use to switch desktop environments, you have to log out and back in before your desktop will change.

3.11 Quitting from KDE

There are several easy ways to log out from your KDE session:

- From the **Main Menu**, select the **Logout** item.



- From the panel, select the **Logout** icon, which looks like:
- From the desktop, right-click on the desktop and select **Logout** from the menu.

KDE offers you the chance to save your current settings, which will preserve your panel settings and keep your currently open applications.

If you're working in an application and you haven't saved your work when you log out, a dialog will inform you that you'll lose your unsaved material when you log out.

When you see this dialog, you can simply select the **Cancel** button, save your work, then log out again. If you continue without saving your work, you'll lose the data.

3.12 Shutting Down at the Shell Prompt

Like the **Run program** option in GNOME, you can use the **shutdown** command to halt or restart your system from a shell prompt, whether you're working in GNOME, KDE, or the non-graphical environment.

To halt or restart your system from a shell prompt:

- Open a shell prompt — From the panel, click on the **Terminal Emulation** or **Console** launcher.
- At the shell prompt, type **shutdown -r now** or **shutdown -h now** and enter your user account password in the dialog box that appears. The **-h** means halt and will shut down the system; the **-r** means reboot and will restart the system.
- At a console, type **shutdown -r now** or **shutdown -h now** and enter your user account password after the **Password** prompt.

Be sure to save your work before halting or restarting your system from the shell prompt. Running applications will be closed and you won't have the option of saving your work or your session.

Killing an X Session

If you're having difficulty quitting your X session, (for example, if you get no response when you click on the **Log out** button in KDE) you can swiftly kill the X session and return to the login screen by pressing the [Ctrl]-[Alt]-[Backspace] keys. This procedure should be used only as a last resort, however. *Make sure you close your running applications and save your work before logging out this way!*

More About Shutting Down

You can specify the delay between when you issue the **shutdown** command and its execution. Replace the word now with a "+" and a number; for example **shutdown -h +5** will shutdown and halt the system after five minutes have passed.

4 Customizing Your Desktop in GNOME and KDE

Both GNOME and KDE offer you plenty of ways to add your own personality to your workspace. Each environment provides powerful control centers, which let you to change the way your workspace looks, sounds, and more.

Both control centers offer quite a few options for you to modify. For more detailed instructions on using them, you should click on their **Help** buttons or read the related documentation from the environments' help browsers.

4.1 Customizing with the GNOME Control Center

You can start the GNOME Control Center from the **Main Menu Button (Programs => Settings => Gnome Control Center)**.

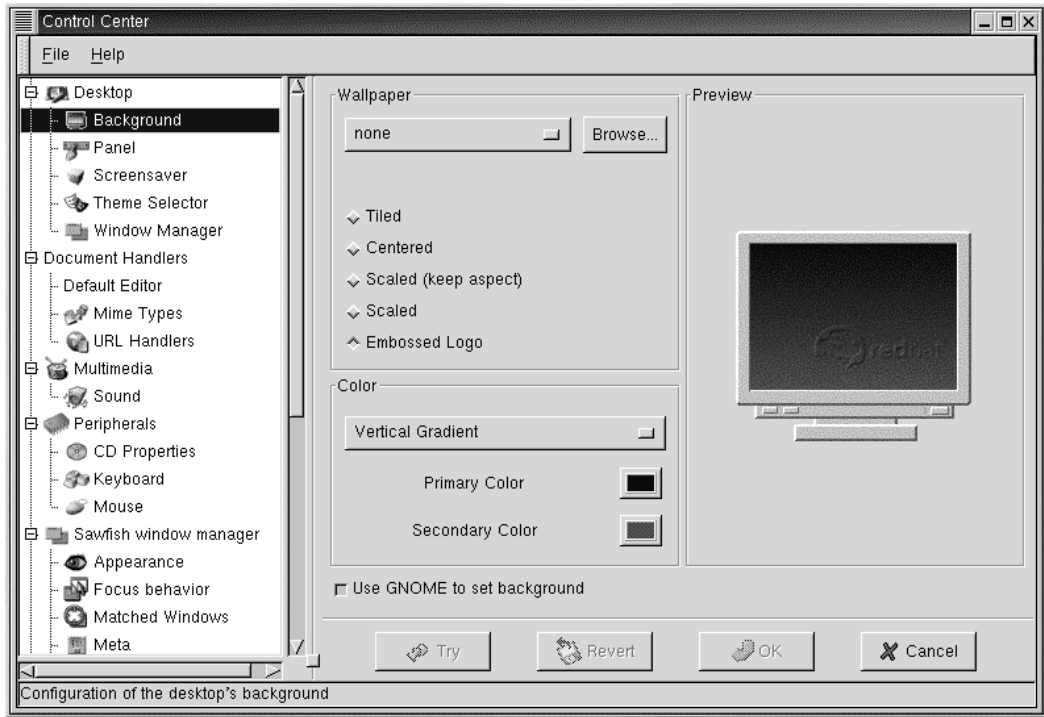
You can also start the GNOME Control Center from the panel, by clicking on the icon, which looks

like: 

4.1.1 Changing the Background

When the GNOME Control Center first starts, it will look like Figure 4–1, *The Background Category in the GNOME Control Center*.

Figure 4–1 The Background Category in the GNOME Control Center



The GNOME Control Center is divided into two panels. On the left, you'll find categories, and on the right, (the main panel), you will see the corresponding elements that you can modify in each category. The categories may be collapsed when you first open the control center. Click on the + to expand the categories.

Preview Your Changes

Not sure you'll be happy with your selections? Click on the **Try** button to see what your desktop will look like with your changes. If you don't like it, just click on the **Revert** button to return to your original settings.

To change your desktop's background, click on the **Background** category. You'll see your current desktop background in the preview screen of the main panel.

In the **Color** section of the **Background** screen, you can determine whether your desktop has a solid or gradient (blended colors) background.

For a solid background, click on the drop-down menu and choose **Solid**. Click on **Primary Color** and the **Pick A Color** palette appears. Choose a color by clicking on it in the color palette. You can move the slider bars on the right side of the right side of the screen to make choices and adjustments as well. Once you find a color you like, click on **OK**.

If you choose **Horizontal** or **Vertical Gradient** from the drop-down menu, you'll want to choose a **Primary** and **Secondary Color**.

If you want something a little more expressive, try adding wallpaper to your desktop.

By default, there are no wallpaper choices available when you click on the drop-down menu under **Wallpaper**. Click on **Browse** and choose the directory that contains saved wallpaper images to view your wallpaper options. Select one of these files and click on **OK**, or just double-click on the file name, to add the file to the drop-down menu.

You can arrange the wallpaper on your desktop in the following ways:

- **Tiled** — The image is repeated across the desktop.
- **Centered** — The image is centered on the desktop, surrounded by your chosen background color or gradient.
- **Scaled (keep aspect)** — The image is scaled to fit as much of the screen as possible without distorting the image.
- **Scaled** — The image is stretched to fit the entire screen.
- **Embossed Logo** — The background image is the default Red Hat logo.

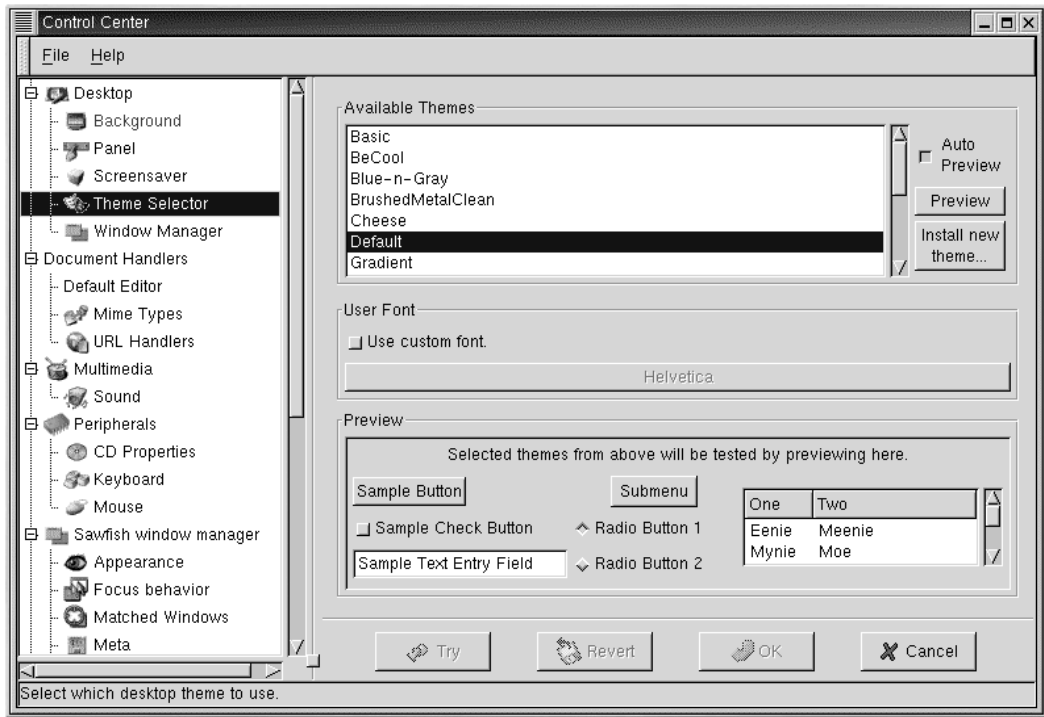
You can deselect the option to **Use GNOME to set background** if you would prefer to set the background in another way (such as through your window manager's configuration program).

4.1.2 Changing the Theme

You can change the look and feel of your workspace with themes. The appearance of your panel, text boxes, buttons, and other visual elements will be coordinated with the theme you select.

To change your current theme, click on the **Theme Selector** in the category panel.

Figure 4–2 The Theme Selector Category



The right panel is divided into sections which allow you to select a new theme, preview its effect, and modify the default font that theme will use (see Figure 4–2, *The Theme Selector Category*).

If you select the **Auto Preview** option, you will be able to preview what the theme will look like in the **Preview** section. If the option is not selected, you can still preview the theme by clicking on the **Preview** button.

More Themes Are Available

If you do not see a theme you like, you can find more themes at <http://gtk.themes.org>, a repository for themes. To install a theme, download a theme from the website, then select the **Install new theme** button. In the dialog which opens, scroll to the name of the file you downloaded (which will probably be in your login directory, named something like *New_theme.tar.gz*). Left-click on the file name, then click the **OK** button. Your new theme will appear in the **Available Themes** section.

In the **User Font** section, click on the option to **Use custom font**, then click on the activated font box to open a new dialog which will let you select a different font on such items as the menu and Tasklist.

4.2 Customizing with the KDE Control Center

You can start the KDE Control Center from either the **Main Menu K** icon (**Settings => Desktop**) or

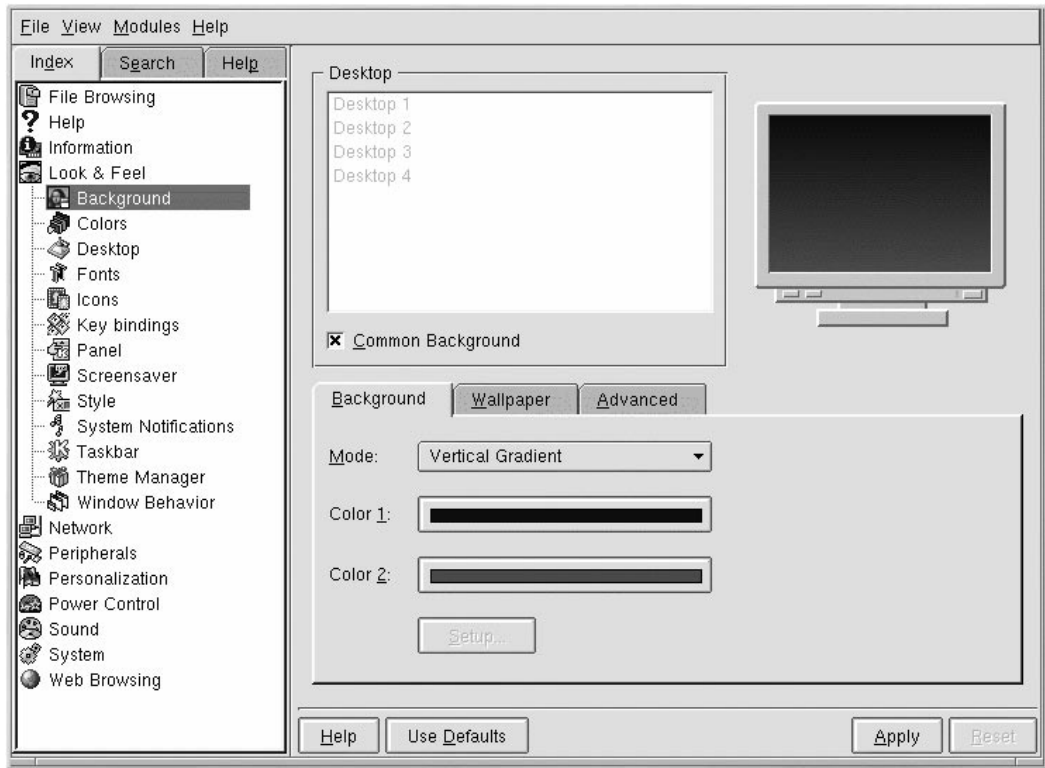


from the panel, by clicking on the KDE Control Center icon, which looks like:

4.2.1 Changing the Background

To change your desktop background in KDE, open the KDE Control Center, click on **Look and Feel** and then on **Background**. The **Background** category of the KDE Control Center will look like Figure 4–3, *The Background Category in the KDE Control Center*.

Figure 4–3 The Background Category in the KDE Control Center



The KDE Control Center is divided into two main panels. On the left, you'll find categories, and on the right, (the main panel), you will see the corresponding elements you can modify for a category. The categories may be collapsed when you first open the control center. Click on the **+** to expand the categories.

In the **Background** category, you can change the background colors from a single color to a two-color gradient, and determine the appearance of the gradient (vertical, horizontal, etc.) by selecting from the **Mode** drop-down menu.

Click on the color bars next to **Color 1** and **Color 2** to choose your background (you don't have to select two colors if you don't want to). Now click on **Setup**. If you choose **Background Program** or **Pattern** from the **Mode** drop-down list, you will now see a dialog asking you to make further selections.

Automatic Preview

Whenever you make a selection for your background, you'll automatically see a preview of the effect in the dialog.

The KDE Control Center's **Background** category allows you to set different backgrounds for each desktop. When the **Common Background** option is unchecked in the **Desktop** panel, the labels for each of your desktops will be highlighted. Click on a label to customize the corresponding desktop. Checking the **Common Background** label will apply your background selection to all your desktops. Note that you can add both colors and/or wallpaper to each of your desktops, as long as the **Common Background** option is unchecked.

Click on the **Wallpaper** tab to choose a pre-selected pattern or photo for your desktop. In the drop-down list next to **Mode**, you can select how you want the image to appear: centered, tiled (the pattern is repeated across your desktop), and others.

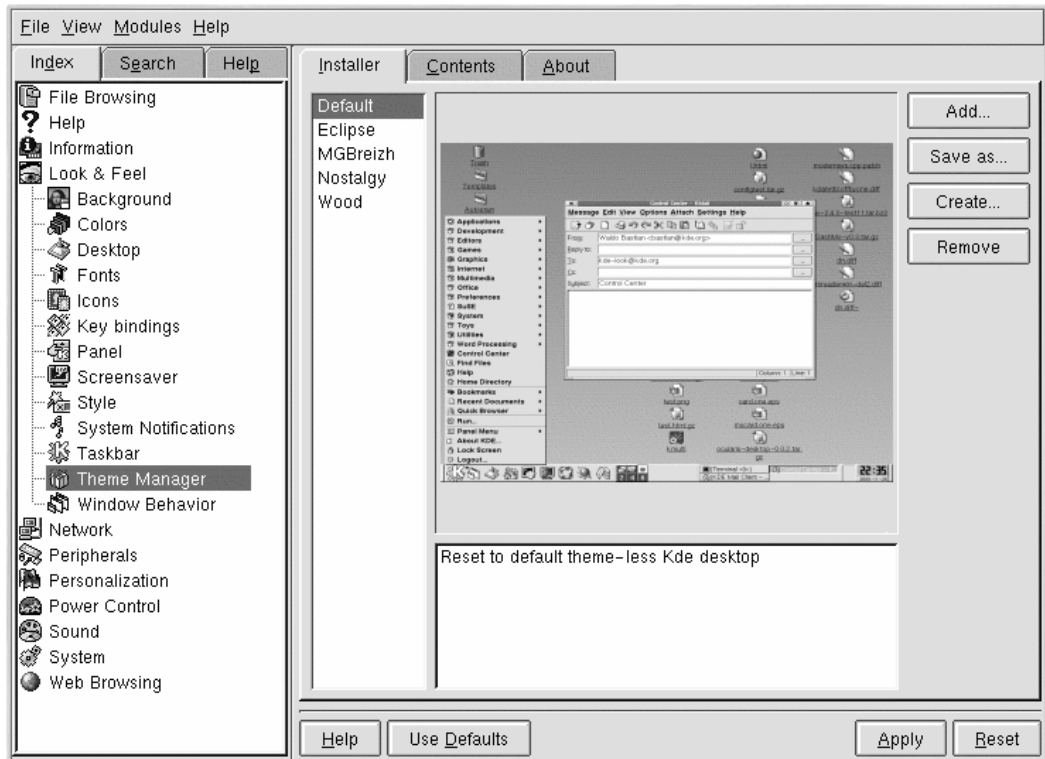
If you want something closer to a total makeover, try changing the theme of your workspace.

4.2.2 Changing the Theme

Applying a new theme to your workspace can change the look and feel of your panel, buttons, menus, and even the background.

To begin, select the **Theme Manager** category (see Figure 4-4, *The KDE Theme Manager Category*). By default, you have several themes, but there are quite a few more themes available at <http://kde.themes.org>.

Figure 4–4 The KDE Theme Manager Category



If you want to install a theme you have downloaded, click on the **Add** button. In the dialog which opens, locate the name of the theme file you have downloaded. Double-click on it or highlight the file and click on **OK**. Your theme will be installed and will appear in the list of themes in the middle of the screen. Select a theme to see a preview. Click on **OK** to apply the theme to your desktop and close the control center. Click on **Apply** to apply the theme without closing the control center.

5 Printer Configuration

Red Hat Linux no longer includes `printtool`. The `printconf` utility has replaced `printtool`. The `printconf` utility maintains the `/etc/printcap` configuration file, print spool directories, and print filters.

To use `printconf`, you must be running the X Window System and have root privileges. To start `printconf`, use one of the following methods:

- On the GNOME desktop, go to the **Main Menu Button** (on the Panel) => **Programs** => **System** => **Printer Configuration**.
- On the KDE desktop, go to the **Main Menu Button** (on the Panel) => **Red Hat** => **System** => **Printer Configuration**.
- Type the command `printconf-gui` at a shell prompt. ¹

Do Not Edit `/etc/printcap`

Do not edit the `/etc/printcap` file. Each time the printer daemon (`lpd`) is started or restarted, a new `/etc/printcap` file is dynamically created.

If you want to add a printer without using `printconf`, edit the `/etc/printcap.local` file. The entries in `/etc/printcap.local` are not displayed in `printconf` but are read by the printer daemon. If you upgrade your system from a previous version of Red Hat Linux, your existing configuration file is converted to the new format used by `printconf`. Each time a new configuration file is generated by `printconf`, the old file is saved as `/etc/printcap.old`.

¹ If you type `printtool` at a shell prompt, `printconf` will start.

Figure 5–1 printconf

The screenshot shows the printconf application window with a menu bar (File, Test, Help) and a toolbar (New, Edit, Delete, Default, Apply). Below the toolbar is a table with the following data:

	Queue	Alias List	Queue Type	Details
<input checked="" type="checkbox"/>	test		LOCAL	PostScript queue on local device /dev/lp0
<input type="checkbox"/>	test2		LPD	HP Color LaserJet 5 lpd queue lp@servername
<input type="checkbox"/>	test3		SMB	PostScript SMB queue on share //machinename/printer
<input type="checkbox"/>	test4		NCP	Canon BJ-10e Novell queue queue on server servername
<input type="checkbox"/>	test5		JETDIRECT	HP Color LaserJet 5000 JetDirect queue 192.168.1.10:9100

Five types of print queues can be configured with `printconf`, but this chapter only covers local printers. For additional information on `printconf` options, see the *Official Red Hat Linux Customization Guide* or click on the **Help** button to view the entire `printconf` manual.

A local printer is a printer attached directly to your computer through a parallel or USB port. In the main printer list as shown in Figure 5–1, *printconf*, the **Queue Type** for a local printer is set to **LOCAL**.

Important

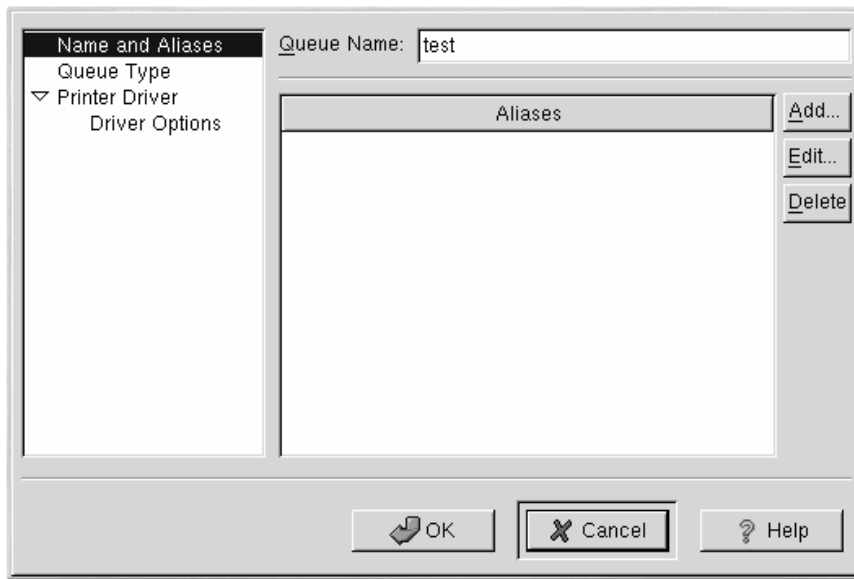
If you add a new print queue or modify an existing one, you need to restart the printer daemon (`lpd`) for the changes to take effect.

Clicking the **Apply** button saves any changes that you have made and restarts the printer daemon.² Alternatively, you can choose **File => Save Changes** and then choose **File => Restart lpd** to save your changes and then restart the printer daemon.

If a printer appears in the main printer list with the **Queue Type** set to **INVALID**, the printer configuration is missing options that are required for the printer to function properly. To remove this printer from the list, select it and click the **Delete** button.

² The changes are not written to the `/etc/printcap` configuration file until the printer daemon (`lpd`) is restarted.

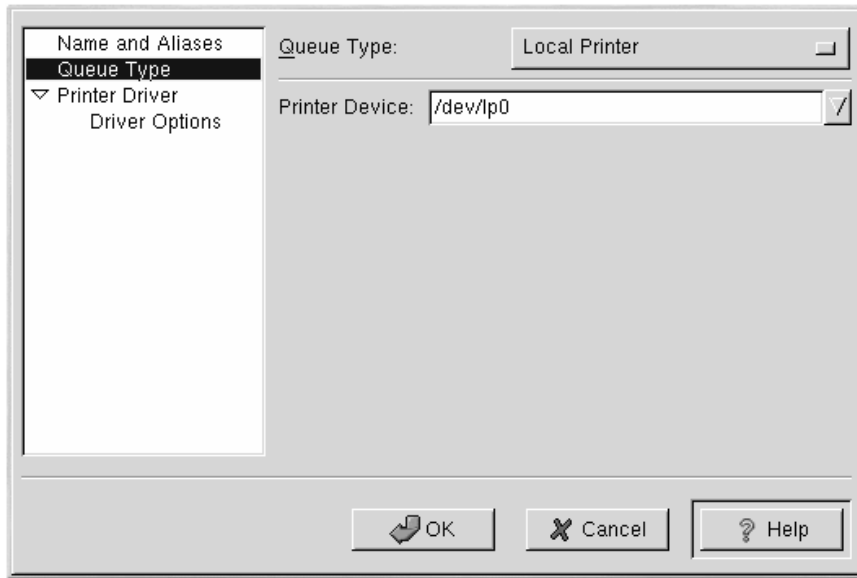
Figure 5–2 Adding a Printer



5.1 Adding a Local Printer

To add a local printer, click the **Add** button in the main `printconf` window. The window shown in Figure 5–2, *Adding a Printer* will appear. Enter a unique name for the printer in the **Queue Name** text field. This can be any descriptive name for your printer. You can also create alias names for the printer by clicking the **Add** button beside the **Aliases** list. Refer to Section 5.3, *Creating Printer Aliases* for more information about aliases. The printer name and aliases cannot contain spaces and must begin with a letter a through z or A through Z. The valid characters are a through z, A through Z, 0 through 9, -, and _.

Click **Queue Type** in the menu on the left and choose **Local Printer** from the **Queue Type** menu. Also enter the printer device in the **Printer Device** text field or choose it from the pulldown menu as shown in Figure 5–3, *Adding a Local Printer*.

Figure 5–3 Adding a Local Printer

Next, select the type of printer that is connected to the system by clicking **Printer Driver** from the menu on the left. After choosing the manufacturer and model number of the printer, a list of drivers will appear. If there is more than one driver for the printer, choose the preferred driver in the **Printer Driver** list. If you are not sure which one to use, do not change this value. Click the **Printer Notes** button to view notes about the printer driver from the Linux Printing Database.

Click **Driver Options** from the menu on the left after selecting a printer driver. These options will vary depending on the printer driver that you selected. Typical options include paper size, print quality, and printer resolution.

Click the **OK** button. The new printer will appear in the printer list in the main window. Click the **Apply** button in the main window to save your changes to the `/etc/printcap` configuration file and restart the printer daemon (`lpd`). After applying the changes, print a test page to ensure the configuration is correct. Refer to Section 5.2, *Printing a Test Page* for details.

5.2 Printing a Test Page

After you have configured your printer, you should print a test page to make sure it is functioning properly. To print a test page, select the printer that you want to test from the printer list, and choose

Test => Print Postscript Test Page, Print A4 Postscript Test Page, or Print ASCII Test Page from the pulldown menu. Do not choose **Print Postscript Test Page** if the printer can not print PostScript.

5.3 Creating Printer Aliases


A printer alias is an alternate name for a printer. To add an alias for an existing printer, select the printer from the printer list, and click the **Alias** button on the toolbar. In the new dialog window that appears add new aliases for the printer or delete existing alias names. A printer can have more than one alias. All aliases for each printer are listed in the **Alias List** column in the printer list. Click **Apply** to save the aliases and restart the printer daemon.


5.4 Modifying Existing Printers


After adding your printer(s), you can edit settings by selecting the printer from the printer list and clicking the **Edit** button. The same window that is used for adding a printer appears, as shown in Figure 5–2, *Adding a Printer* appears. The window contains the current values for the printer that you selected to edit. Make any changes, and click **OK**. Click **Apply** to save the changes and restart the printer daemon.

If you want to rename a printer, select the printer from the printer list, and click the **Rename** button on the toolbar. A dialog box will appear with the current name of the printer. Rename the printer, and click the **OK** button. The name of the printer should change in the printer list. Click **Apply** to save the change and restart the printer daemon.

To delete an existing printer, select the printer and click the **Delete** button on the toolbar. The printer will be removed from the printer list. Click **Apply** to save the changes and restart the printer daemon.

To set the default printer, select the printer from the printer list and click the **Default** button on the toolbar. The default printer icon  appears in the first column of the printer list beside the default printer.

If you want to modify an imported printer's settings, you can not modify its settings directly. You must override the printer. You can only override an imported printer that has been imported using the alchemist libraries. Imported printers have the  symbol beside them in the first column of the printer list.

To override the printer, select the printer, and choose **File => Override Queue** from the pulldown menu. After overriding a printer, the original imported printer will have the  symbol beside it in the first column of the printer list.

5.5 Additional Resources

To learn more about printing in Red Hat Linux, refer to the following resources.

5.5.1 Installed Documentation

- `man printcap` — The manual page for the `/etc/printcap` printer configuration file.

5.5.2 Useful Websites

- <http://www.linuxprinting.org> — *GNU/Linux Printing* contains a large amount of information about printing in Linux.
-

6 Getting Online

Normally, PPP accounts are used to dial in using a modem to an Internet Service Provider (ISP). Using PPP (Point-to-Point Protocol), you connect to a large network (the Internet) through your ISP; your machine becomes a part of that network and you use the resources of the network.

Both GNOME and KDE offer useful tools for establishing and modifying PPP accounts used to connect to ISPs. These utilities remove much of the guesswork in creating an online connection; in many cases, your only requirement is an ISP account.

The utilities, RP3 for GNOME and Kppp for KDE, can be interchangeable, too. You can use RP3 to set up and connect in KDE; similarly, you can use Kppp if you're using GNOME.

If you use RP3 or Kppp outside of their respective environments, however, you will lose the ability to dock the running applications. That means you won't be able to integrate RP3 into the KDE panel or Kppp in the GNOME panel. When they're docked on their panels, both utilities provide information about your connection, such as connection time, speed of the connection, and more. You will be able to minimize these utilities on the panel, however.

Note, also, that if you create an account in GNOME with RP3, but would rather use Kppp, you'll have to set up your account again in that application; in other words, information you enter in one application won't be available to the other application.

You Must Be Root

Because you'll be making changes to your system, you must be root in order to create a PPP account. If you're in your user account, you'll be asked for your root password before proceeding in either RP3 or Kppp.

Your own ISP may have specific connection requirements for their service which differ from the instructions in this chapter. Before connecting with either of these tools, check first with your ISP for any specific instructions that they provide, including the following information:

- The phone number that your modem must dial to connect to your ISP.
 - Your login name and password for the ISP account.
 - Possibly, a gateway address. Some ISPs may require you to specifically type in the address for the ISP's gateway.
 - **DNS entries:** DNS means **Domain Name System**. DNS servers act as a roadmap for the Internet. When you use the Internet, the DNS tells your machine where to send its message traffic. The DNS tracks **IP** (Internet Protocol) addresses; each computer connected to the Internet must have an IP
-

address, which is a unique set of numbers like `2xx.2xx.2x.2`. You may receive one or more DNS entries from your ISP when you sign up. Both RP3 and Kppp provide spaces for you to enter these numbers.

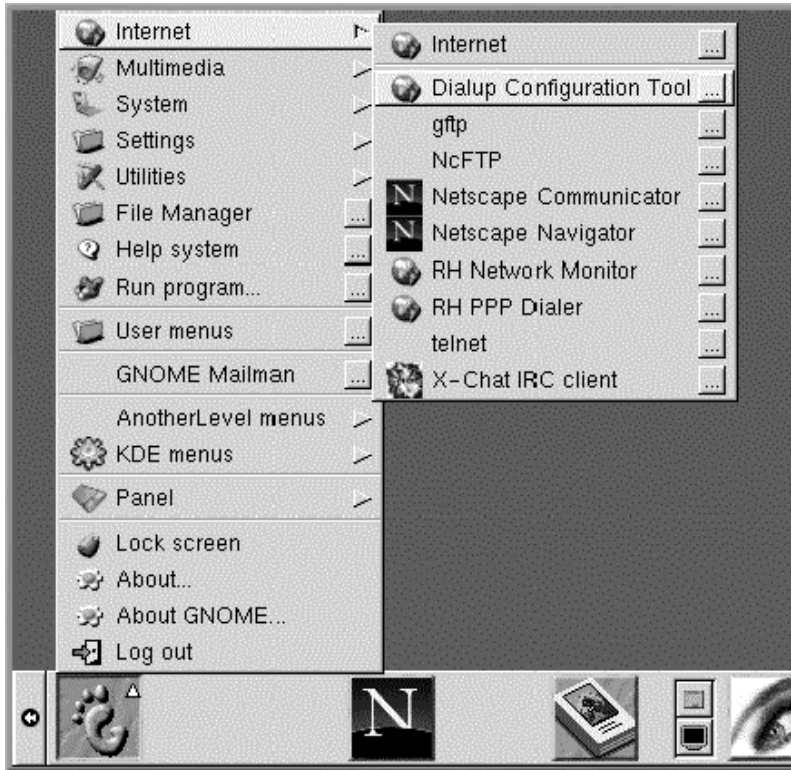
6.1 Using RP3 to Connect

RP3, the Red Hat dialup configuration tool, can make easy work of connecting to the Internet or to some other network devices. You can use RP3 to connect your modem to a PPP account, and then you can view statistics about the connection, such as the time, speed, and cost of the current connection.

RP3 and netcfg

While RP3 is useful for creating a PPP account, you should avoid using the application in conjunction with another network configuration utility, called **Network Configurator** (`netcfg`). Both applications can create a PPP dialup connection, but you should use either one or the other. For most account purposes, the **Dialup Configuration Tool** will work well.

RP3's **Dialup Configuration Tool** dialog (see Figure 6-1, *Finding the Dialup Configuration Tool on the Menu*) allows you to easily configure your system for an Internet connection, helping you to locate your modem, enter the account information, and connect.

Figure 6–1 Finding the Dialup Configuration Tool on the Menu

6.1.1 Creating a New Internet Account

To create a new PPP account, go to **Main Menu Button => Internet => Dialup Configuration Tool**.

Next, type your root password when you're prompted and click on **OK** to continue to the opening screen for the **Add New Internet Connection** tool.

If you don't already have devices configured, you'll see the **Add New Internet Connection** dialog (see Figure 6–2, *The Add New Internet Connection Dialog*).

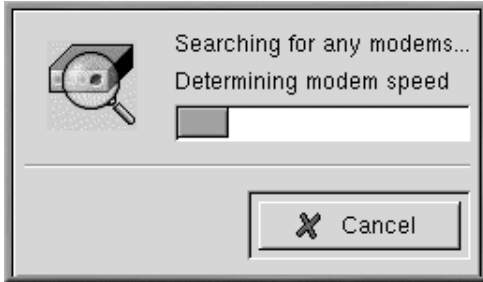
Figure 6–2 The Add New Internet Connection Dialog

If Devices Are Detected

If there are devices detected, such as an Ethernet card, you can simply choose a listed device so that the application is running on the panel or the desktop. Once the application is running, right-click on the application to open the **Options** menu and select **Configure PPP**.

To proceed, click on **Next**; to quit the utility without making any changes or additions, use the **Cancel** button. You can cancel without saving changes at any time during the process. You can also return to a previously completed screen by clicking on the **Back** button.

Your next task is to configure a modem. RP3 will try to automatically detect a modem on your system (as in Figure 6–3, *Searching for a Modem*).

Figure 6–3 Searching for a Modem

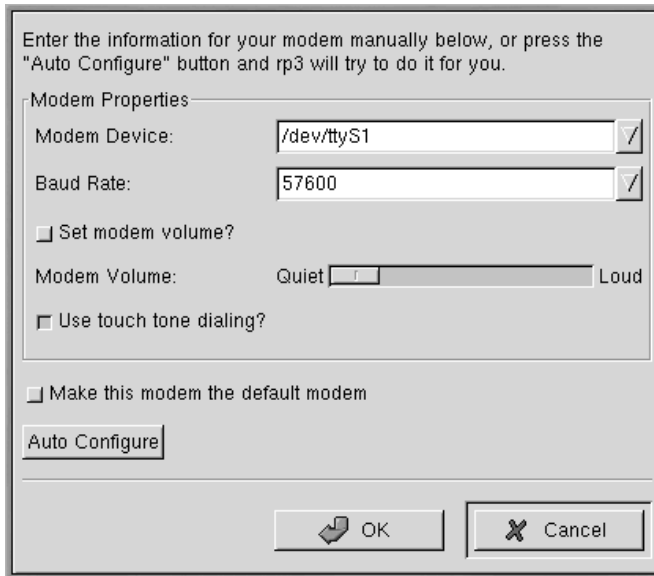
If your modem isn't detected during the search, you'll receive a message stating that it couldn't be found.

You can still enter details about your modem's location, speed, and other information, in the **Edit Modem Properties** dialog, as shown in Figure 6–4, *The Edit Modem Properties Dialog*. This dialog will appear if no modems were detected on your system. Refer to your modem manufacturer's documentation for specifics to enter here.

To access the **Edit Modem Properties** dialog at any time, go to **Main Menu => Programs => Internet => Dialup Configuration**. Select the **Modems** tab, click on **Edit**, and make the desired changes.

What are Winmodems?

If your machine uses a modem which relies on software drivers for some of its functionality, you've probably got a "Winmodem." Because they depend on Windows-based software to operate correctly, these types of may not function in Linux.

Figure 6–4 The Edit Modem Properties Dialog

In the **Edit Modem Properties** dialog, you can specify the location of your modem, its baud rate, your preference regarding the speaker volume during a call, and whether to use touch tone dialing.

Although RP3 attempts to detect the correct port, you can adjust the settings here.

If you know that your modem is attached to COM2 under Windows, for example, its location in Linux will be `/dev/ttyS1`. Here is a comparison of serial port names in MS-DOS (and Windows) and Linux:

- COM1 = `/dev/ttyS0`
- COM2 = `/dev/ttyS1`
- COM3 = `/dev/ttyS2`
- COM4 = `/dev/ttyS3`

Using the pulldown list in the **Modem Device** field, select the port to which your modem is connected. Then, in the **Baud Rate** field, enter the fastest recommended speed for your modem. Due to most modems' data compression capabilities, select a baud rate that is faster than the modem's advertised speed (a typical 56k device, for example, would have a baud rate of 115200).

You can also select your volume and dialing preferences in this dialog. Dragging the bar to **Loud** in the **Modem Volume** field will let you hear everything that goes on during a connection, from dialtone to the connection negotiation. Note that some modems will allow only a sound on/sound off configuration, rather than gradations of volume.

The **Use touch tone dialing** button, when selected, will dial using touch tone; when deselected, you'll dial using pulse.

Check **Make this modem the default modem** to use your current modem settings each time you run RP3.

You can also rescan your system for modem information by selecting the **Auto Configure** button, then choose to keep the settings it finds.

Once you're satisfied with your settings, click on **Next** to proceed to the following screen.

Manually Create a Modem

Even if your modem is automatically detected, you can adjust the modem's settings by choosing to **Manually create a modem** after RP3 detects your device. Your choices, such as location of modem, baud rate, and volume, will be identical to those you'd find if the modem had not been detected.

In the **Phone number and name** dialog (see Figure 6-5, *Adding a Name and Phone Number*), you should enter both the name you would like to give your account and the telephone number of your ISP. If you need to dial an area code, fill that in here.

If you must dial a "9" to reach an outside line, enter this number in the **Prefix** field. To disable call waiting, type ***70** in this field.

Other Dialing Options

RP3 uses an application called `Wvdial` for some of its functions, such as dialing and authentication with the PPP server. To learn about other dialing options which might be available, read the `Wvdial` man page. Type **man wvdial** in a shell prompt. Use the spacebar to move forward through this document a page at a time, use the [b] key to move back, and use the [q] key to quit.

Figure 6–5 Adding a Name and Phone Number

Phone number and name

Select a name for this internet connection.

Account name:

Enter the internet provider's phone number.
The prefix and area-code are optional.

Prefix Area code Phone number

The dialog which follows, **User name and password**, asks you to provide the name you use to sign on to your ISP, as well as your login password for the service. Your password will appear as a series of asterisks (see Figure 6–6, *Specifying a User Name and Password*).

Figure 6–6 Specifying a User Name and Password

User name and password

Enter the user name for this account.

User name:

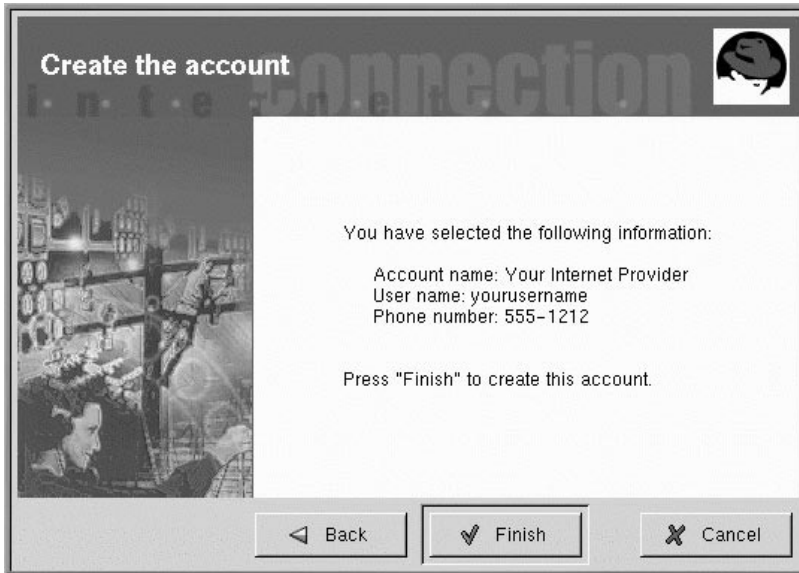
Enter the password for this account.

Password:

◀ Back ▶ Next ✕ Cancel

In the next dialog that appears (**Other Options**) you can choose a pre-selected ISP or a **Generic Account**, if your ISP isn't listed. If your ISP is listed, you should select the appropriate entry, due to variations in connection protocols which require specific network negotiations between your system and your ISP's.

You can check your information in the **Create the account** dialog which follows (see Figure 6–7, *Checking Your Entries*).

Figure 6–7 Checking Your Entries

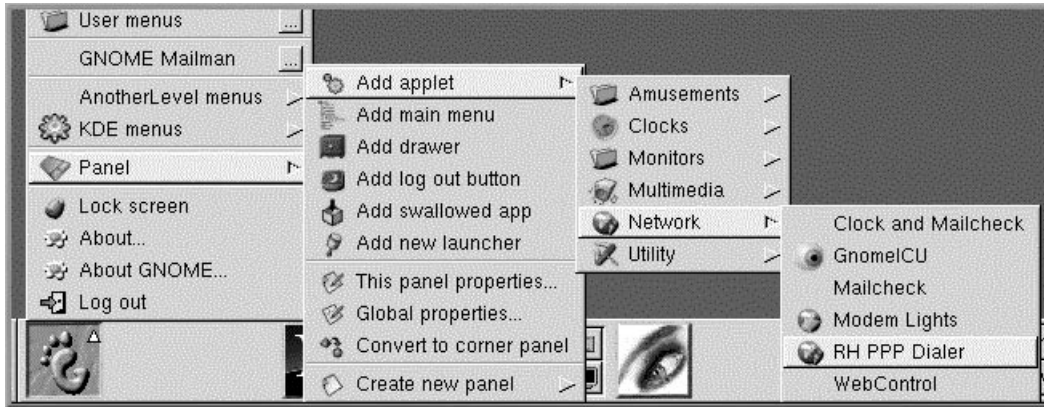
If you're satisfied with your entries, click on **Finish** to create the account; if you want to modify the information, click on **Back** to go to a previous screen.

The configuration tool modifies multiple files. The main files which are affected are `/etc/sysconfig/network-scripts/ifcfg-ppp*` and `/etc/wvdial.conf`. If you find it necessary to modify an existing entry, however, you can edit that entry with **RP3**, rather than edit a file by hand. See Section 6.1.4, *Customizing and Configuring RP3* for more information on customizing the settings.

6.1.2 Connecting and Disconnecting

Once you have configured your PPP account, you can dock a launcher for **RP3** on the panel (right-click on the **Panel** => **Applets** => **Network** => **RH PPP Dialer**) and just click on it to start **RP3**.

Figure 6–8 Adding RP3 to the Panel



To see all of your user-controllable network devices, such as modems and Ethernet cards, from the **Main Menu** go to **Programs => Internet => RH Network Monitor**. Similar to the two previous methods, the application will appear on the desktop, rather than docking onto the panel.

You can also launch RP3 without docking it into the panel from either the **GNOME panel** (by going to **Main Menu => Programs => Internet => RH PPP Dialer**) or from the shell prompt, by typing `/usr/bin/rp3` in a shell prompt.

When the application starts, you'll be asked to select which interface you want to activate; choose the name of the PPP service you created during configuration.

To begin your online session, left-click on the RP3 monitor and, in the dialog which asks if you want to start the interface, select **Yes**. You can also right-click on the monitor, then drag your cursor to the **Connect to...** entry showing your ISP account name.

Similar to the procedure for connecting, you can disconnect from your session by left-clicking on the monitor, then choosing **Yes** to close the interface (or right-clicking on the monitor and selecting **Disconnect from...**).

6.1.3 Working with the RP3 Monitor

When the RP3 monitor is docked on the panel, it will look like Figure 6–9, *The RP3 Monitor Docked (Second Icon From Left)*.

Figure 6–9 The RP3 Monitor Docked (Second Icon From Left)



During the time you're connected, the RP3 monitor will display two bar graphs showing connection activity: the top graph will show data transmitted and the bottom graph will show data received (see Figure 6–10, *The RP3 Monitor*).

Figure 6–10 The RP3 Monitor



Beneath the graphs, you'll find text entries which will display the bytes received per second and either your total connection time or the total cost of your current session (if you've specified this option when you configured the account).

6.1.4 Customizing and Configuring RP3

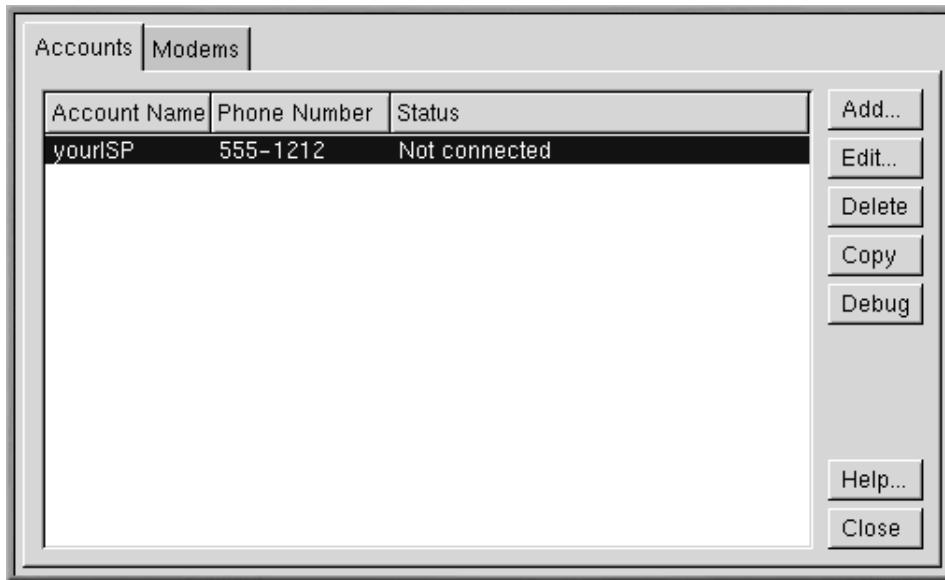
RP3 makes easy work of setting up an Internet account, but you may still find you've got a little tweaking to do before you're up and running.

By default, when RP3 connects to your ISP, it starts `pppd`. What is `pppd`? It means **Point-to-Point Protocol daemon**; briefly, it helps your machine "talk" to your ISP.

You can learn more about `pppd` by reading its man page. At the shell prompt, type `man pppd`.

You can customize and configure account information by right-clicking on the RP3 monitor and selecting the **Configure PPP** entry.

Figure 6–11 The Internet Connections Dialog



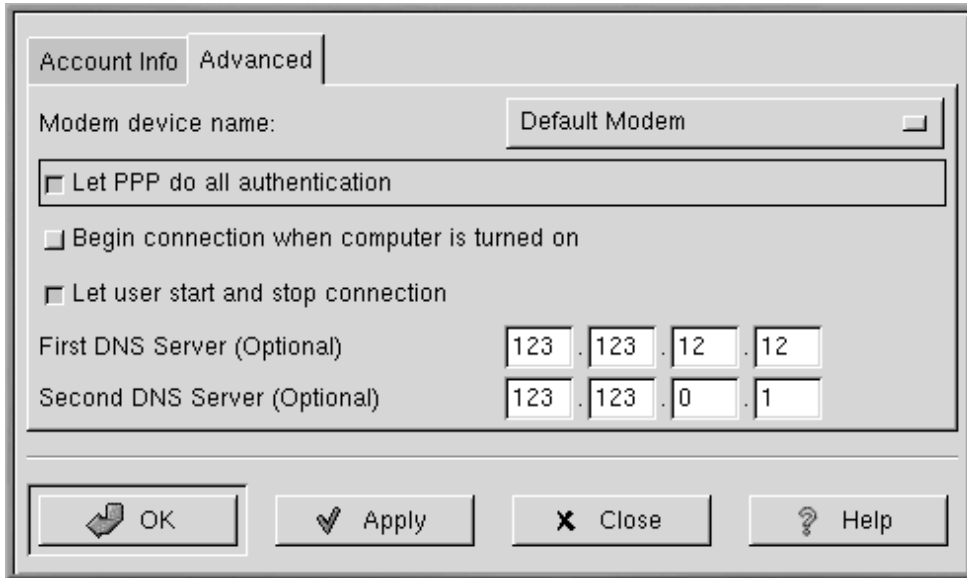
In the **Internet Connections** dialog which appears, you can add a new account, delete an account and modify current account configuration. You can also debug the account, meaning that you can test your settings to see if there are any problems (if you have not set up an account, the **Debug** button will read **Dial** and will not be functional).

Selecting the **Add** button will start the **Configure PPP** tool, allowing you to enter new account information.

If you choose to modify details in a current account, select the **Edit** button. When the **Edit Internet Connection** dialog opens, you can change account details in the **Account Info** tab. Among the fields you can modify are your login name, your password, and your ISP's telephone number.

If your ISP provided you with DNS numbers, which may be necessary for a successful connection, you can enter them in the **Advanced** tab of this dialog (see Figure 6–12, *The Advanced Settings Dialog* for an example).

Figure 6–12 The Advanced Settings Dialog



Among other options in the **Advanced** tab, you can choose to have the connection start automatically (**Begin connection when computer is turned on**) or manually (**Let user start and stop connection**).

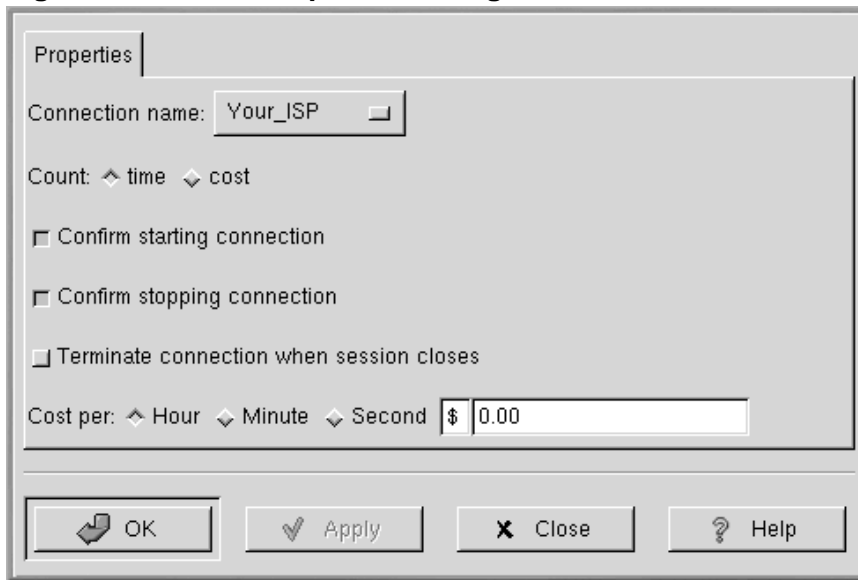
The option **Let PPP do all authentication** will cause `pppd` to start immediately upon a successful connection. Learn more about this in Section 6.1.5, *Troubleshooting RP3*.

In the **Modems** tab of the **Internet Connections** dialog, you can specify the location of your modem (such as `/dev/ttyS1`). You can either type in the information, or click on the **Find Modem...** button, which will attempt to automatically detect your modem.

You can determine how you want to view some details about your connection status. To change the default settings, right-click on the application while it's running and, in the menu which appears, left-click once on **Properties** to display the **RP3 Properties** dialog box.

In the **Properties** dialog (see Figure 6–13, *The Properties Dialog*), you'll find the following entries:

Figure 6–13 The Properties Dialog



- **Connection name:** Allows you to switch between network connections that you have previously configured.
- **Count:** Allows you to specify whether you want to view your time online or the costs of your online session.
- **Confirm starting connection:** Confirms your intention to start a connection.
- **Confirm stopping connection:** Confirms your intention to stop a connection.
- **Cost per:** If you pay for Internet access by the hour, minute, or second, you can specify the cost for your access here. When you're connected, your connection costs will then be reflected on the RP3 monitor.

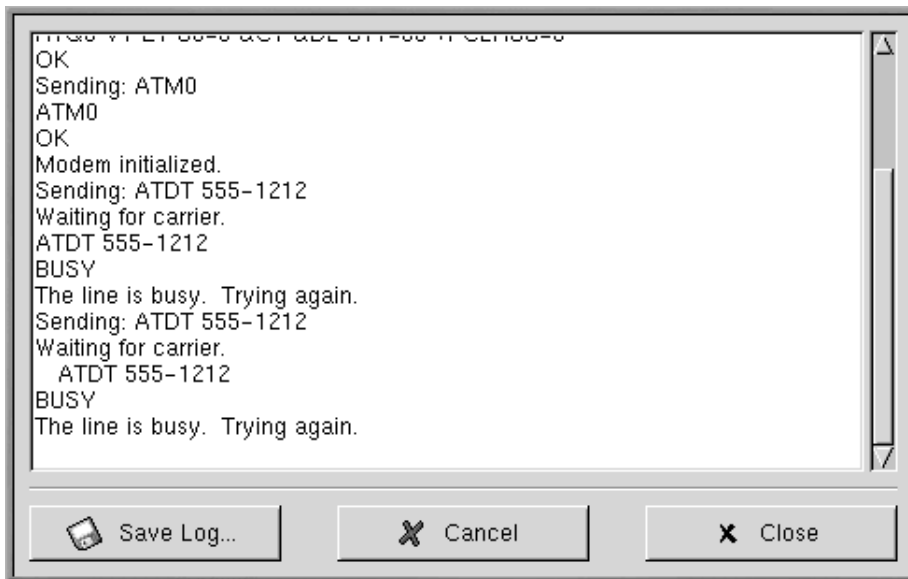
6.1.5 Troubleshooting RP3

Sometimes, things may not go as well as you'd hoped when you're trying to establish a connection. That's when debugging can be useful. Briefly, debugging allows you to see some of what's happening with your system when you're trying to connect.

To start, launch RP3 and open the **Accounts** tab in the **Internet Connections** dialog. Highlight the account you want to debug and click on the **Debug** button in the options to the right.

Once you choose to debug the account, you'll see a window similar to Figure 6–14, *Debugging an Account*, showing you the commands which are used to initialize your modem, connect to your ISP, and perform a login to your Internet account.

Figure 6–14 Debugging an Account



The lines may scroll by very quickly at first. Once they stop, you can scroll through the window to study the information. For easier review, you can choose the **Save Log** button to save the contents of the window as a text file. The text file can then be printed or opened in a pager, a text editor, or a word processor.

You may find, for example, that you can connect to your ISP, but you're not correctly logging in. Check first to make certain that you entered the correct user name and password for your account.

It's also possible that the `pppd` is starting too early, before you have a chance to log in with your name and password. In this case, you *appear* to be successfully connected, yet when you try to view a Web page with Netscape Navigator, you receive error messages.

If this is the case, stop debugging the connection by selecting **Close** or **Cancel**, then return to the **Edit** feature in the **Accounts** tab.

In the **Edit Internet Connection** dialog, select the **Advanced** tab and deselect the option **Let PPP do all authentication**. By default, this option isn't selected when you create an account. If everything else looks correct, choose **OK** to return to the **Accounts** tab.

Now, debug the connection again. You might find that your login procedure goes a little more smoothly, since `pppd` isn't started immediately, but rather waits until your login name and password are sent to your ISP.

Working with the debug feature can help you discover the problem that might be keeping you from a working connection. When you're finally successful, close the window to stop debugging. Since the debug option is only used to diagnose your setup, it won't maintain your connection to your ISP.

When you've successfully configured your connection, start the interface as described in the beginning of this section.

6.2 Connecting with Kppp

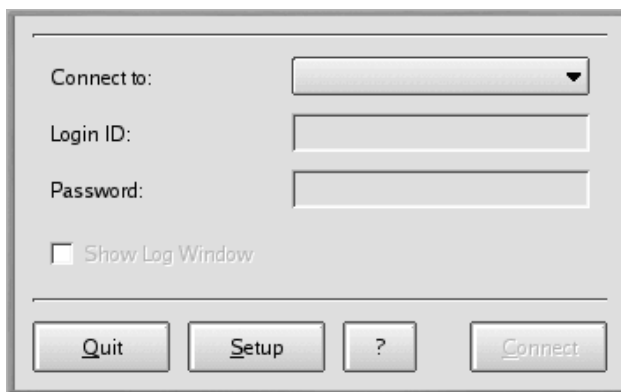
Kppp can make establishing your Internet connection easy, and easy to modify. A dialer and configuration application, Kppp works with `pppd`, the Point-to-Point Protocol daemon.

6.2.1 Starting Kppp

To start Kppp, go to the **Main Menu => Programs => Internet => Internet Dialer**.

Type the password for the root account when it's requested. The opening dialog for Kppp will be "grayed out," because you haven't created an account yet (see Figure 6–15, *The Main Dialog of Kppp*).

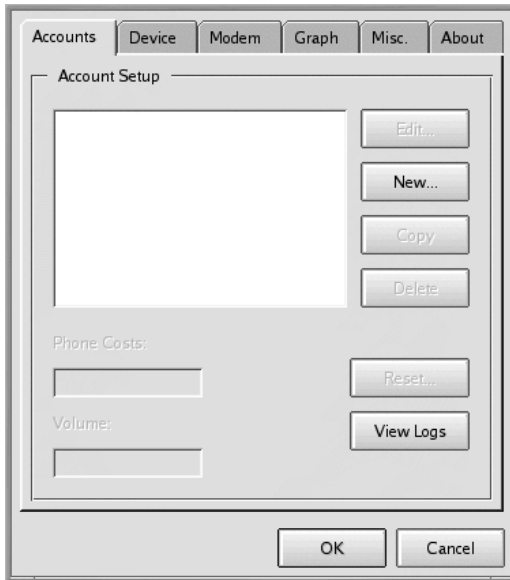
Figure 6–15 The Main Dialog of Kppp



6.2.2 Configuring Kppp

To begin, click on the **Setup** button. The next dialog to open will be the Kppp configuration dialog (similar to Figure 6–16, *The Kppp Configuration Dialog*).

Figure 6–16 The Kppp Configuration Dialog



In the **New Account** dialog, you can specify the account details, such as name, phone number, DNS entries, and other information. The information is divided into tabbed dialogs.

Click on the **New** button to enter your Internet account information.

6.2.3 The Dial Tab

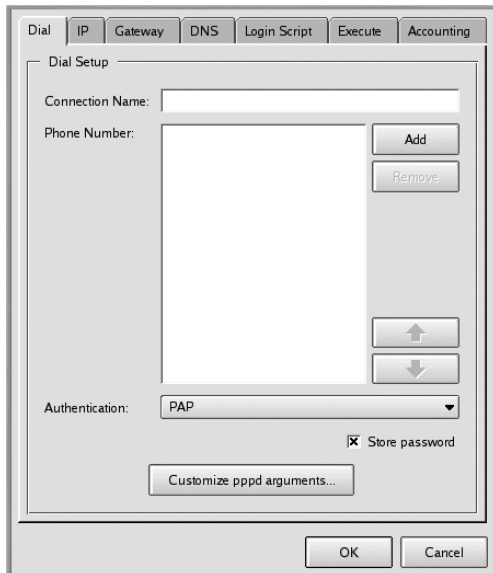
On the **Dial** tab, enter the following:

- **Connection Name:** The name you wish to give your account (for example, Mindspring or My ISP).
- **Phone Number:** The phone number to connect to your ISP. Click on **Add** to enter a new number to this list.
- **Authentication:** From this pulldown list, you can select a **method of login authentication:** PAP, Script-based, Terminal-based, or CHAP. (These are methods used to verify your login. You may

want to check with your ISP to determine which type of authentication method you must use.) If you're required to use a script-based login, Section 6.2.7, *The Login Script Tab* can assist you in entering your script.

- **Store password:** Check this option if you don't want to be required to enter your password each time you want to log on.

Figure 6–17 The New Account Dial Tab



You can also customize options you want to pass to pppd in the **Edit pppd arguments** field, by clicking on the **Customize pppd Arguments** button.

Unless you know what you're doing, however, you should leave these additional options alone.

6.2.4 The IP Tab

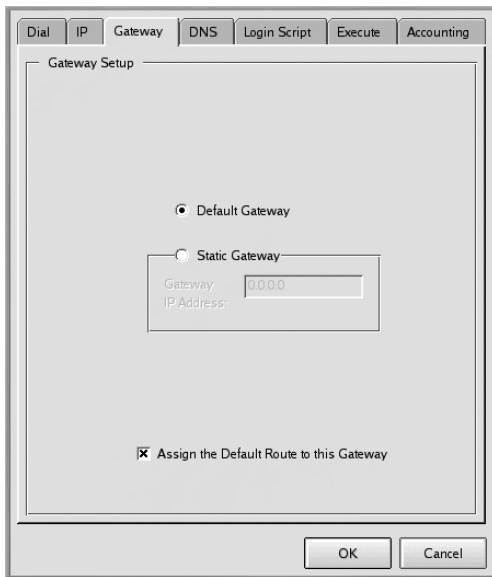
On the **IP** tab, you should specify whether you'll be using a dynamic IP address or a static one. A static IP address is provided to you by your ISP. If you have one of these, check **Static IP Address** and enter the address and Subnet Mask beneath. If your ISP has not provided you with an address, check the **Dynamic IP Address** field (see Figure 6–18, *The New Account IP Tab*).

Figure 6–18 The New Account IP Tab

The image shows a dialog box titled "IP Setup" with several tabs at the top: "Dial", "IP", "Gateway", "DNS", "Login Script", "Execute", and "Accounting". The "IP" tab is selected. Inside the dialog, there are two radio buttons: "Dynamic IP Address" (which is selected) and "Static IP Address". Below the "Static IP Address" radio button, there are two input fields: "IP Address:" and "Subnet Mask:". At the bottom of the dialog, there is a checkbox labeled "Auto-configure hostname from this IP" which is currently unchecked. Below the checkbox are two buttons: "OK" and "Cancel".

6.2.5 The Gateway Tab

Figure 6–19 The New Account Gateway Tab



On the **Gateway** (see Figure 6–19, *The New Account Gateway Tab*) tab, select either **Default Gateway** or **Static Gateway**. If your ISP has specified an IP address you should use as a static gateway, enter that IP number in the space provided.

Assigning the Default Route

Unless you know what you're doing, you should leave **Assign the Default Route to this Gateway** box checked. Unchecking this option could cause problems for your software when you're online.

6.2.6 The DNS Tab

On the **DNS** tab (see Figure 6–20, *The New Account DNS Tab*), you should enter the name of your ISP's domain name (such as *earthlink.net*).

Figure 6–20 The New Account DNS Tab

The screenshot shows a dialog box with several tabs: Dial, IP, Gateway, DNS (selected), Login Script, Execute, and Accounting. The main content area is titled 'DNS Servers' and includes the following elements:

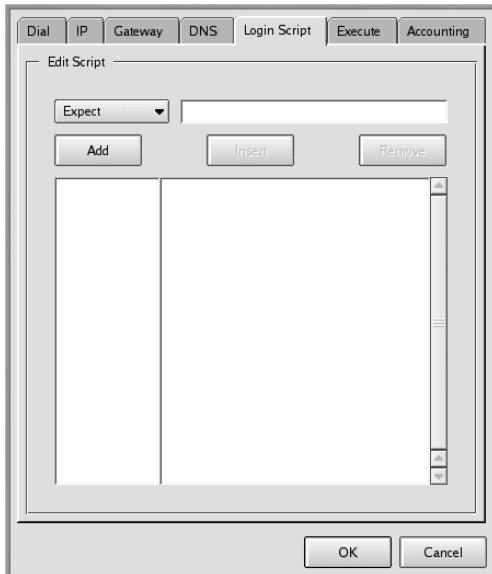
- Domain Name:** A text input field.
- Configuration:** Two radio buttons: 'Automatic' (selected) and 'Manual'.
- DNS IP Address:** A text input field with 'Add' and 'Remove' buttons positioned below it.
- DNS Address List:** A large empty list box.
- Disable existing DNS Servers during Connection:** A checkbox at the bottom left.
- OK** and **Cancel** buttons at the bottom right.

You can select the **Automatic** configuration option or you can select **Manual** and enter the DNS addresses your ISP provided you with in the **DNS IP Address** field. When you've finished typing in the numbers, click on **Add** and the numbers will be entered into the **DNS Address List** box. (By default, you won't be able to click on the **Add** button until you've entered the entire DNS number in the address field.)

Note that the field **Disable existing DNS Servers during Connection** will override the DNS list. If you've entered DNS numbers, you should leave this option unchecked.

6.2.7 The Login Script Tab

The **Login Script** tab allows you to specify how you want to login to your ISP (see Figure 6–21, *The New Account Login Script Tab*). If you chose to use a script-based login in the **Authentication** procedure of the **Dial** tab, you can enter that script here.

Figure 6–21 The New Account Login Script Tab

Not all ISPs require a script-based login procedure; you should check with your ISP to find out specific entries which might be necessary in a login script.

A login script helps your machine negotiate a successful connection with your ISP. Your machine expects a string of information from your ISP, then sends a string of information or prompts.

On the **Login Script** tab, use the pulldown list at the left of the dialog to create a series of steps you want your machine to follow when you log in to your ISP. You can select a variety of options to create your script, step by step. In the field to the right of the pulldown list, type in the specific information you want to supply with the option from the pulldown list.

Click the **Add** button to add your step. If you must modify your script, you can choose an option, supply the information, and use the **Insert** button to place it in the script, rather than having to recreate the script manually.

You can also remove a step in your script by highlighting the entry and clicking the **Remove** button.

If you have difficulty connecting to your ISP after you configure Kppp, check the option **Show Log Window** on the main Kppp dialog. The log window will open when you try to connect to your ISP, showing you what your ISP is expecting and what your machine is sending.

Table 6–1, *A Sample Login Script* shows a sample login script for an ISP which sends a prompt for the login ID, then for the password, and finally, after a brief pause, requires that a user send the string `ppp`.

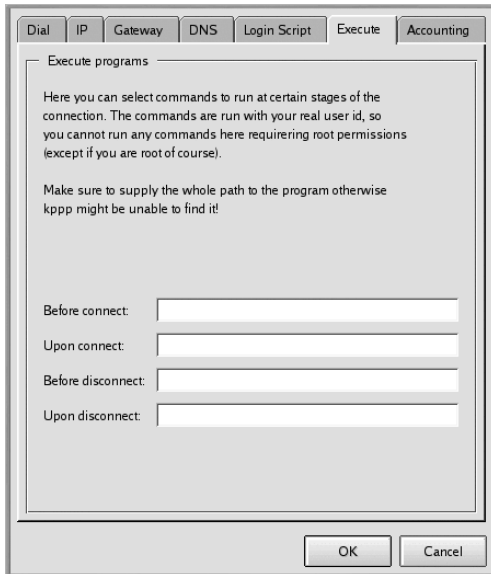
Table 6–1 A Sample Login Script

Option	Enter	Purpose
Expect	ID:	Wait for the ID: login prompt from the server
Send	mylogin	Send your login name for the account
Expect	word:	Wait for the password prompt from the server
Send	mypassword	Send the account's password
Expect	welcome to yourisp	Wait for the welcome message from the server
Pause	3	Specifies a pause of three seconds (a value for Pause will be in seconds, by default)

It may not be necessary for you to use a script-based login procedure; however, this depends on your ISP's requirements. In some cases, using PAP or CHAP may be all that's necessary. Again, check with your ISP for specific login requirements.

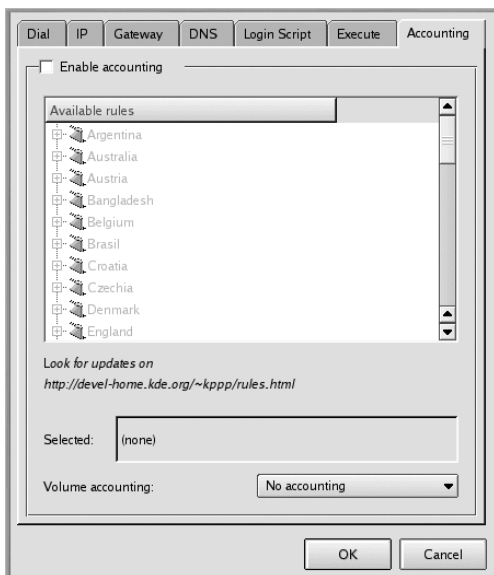
6.2.8 The Execute Tab

You can enter commands to run at different stages of your connection on the **Execute Tab**. For example, type `netscape` in the field next to **Upon connect** and Netscape will open automatically when you connect.

Figure 6–22 The New Account Execute Tab

6.2.9 The Accounting Tab

On the **Accounting** tab, you can specify whether and how you want Kppp to monitor your online activities (see Figure 6–23, *The New Account Accounting Tab*).

Figure 6–23 The New Account Accounting Tab

Accounting is useful if your ISP bills you by the number of bytes transferred during your time online rather than by a flat monthly rate. Referred to as volume accounting, this tool will count the number of bytes to or from your machine on the Internet.

To enable accounting, check the **Enable accounting** box at the top of the tab. Then select the appropriate region from the list of rules beneath. From the pulldown list next to **Volume accounting**, select **incoming bytes**, **outgoing bytes**, or both.

Once you're finished filling in information on all of the tabs, click on **OK** to create your account.

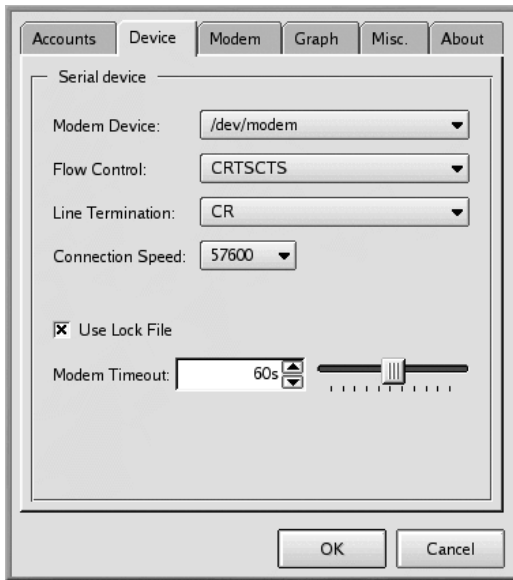
Next, in the **kppp Configuration** window, you'll see your newly created account. If you want to modify the account, highlight the account by clicking on it once, then selecting the **Edit** button to the side of the **Account Setup** window.

6.2.10 Specifying a Device

Now, it's time to provide the location and speed of your modem. Go back to the **Kppp Configuration Dialog** and select the **Device** tab (see Figure 6–24, *The Kppp Configuration Device Tab*). Here, you specify where your modem is located, its baud rate, some hardware settings, and other specifics.

In the **Modem Device** field, you'll find a pulldown menu from which you can choose the location of your modem.

Figure 6–24 The Kppp Configuration Device Tab



The following list is a comparison of serial port names in MS-DOS (and Windows) and Linux. If you know that your modem is attached to COM2 under Windows, for example, its location in Linux will be `/dev/ttyS1`.

- COM1 = `/dev/ttyS0`
- COM2 = `/dev/ttyS1`
- COM3 = `/dev/ttyS2`
- COM4 = `/dev/ttyS3`

Once you've selected the location of your modem, you can select the flow control.

Although you have a choice in the pulldown list for **Flow Control**, the default, **CRTSCTS**, which specifies hardware flow control, is the recommended setting (**XON/XOFF** specifies software flow control).

The following field, **Line Termination**, allows you to specify a correct setting for your modem. Often, the **CR/LF** entry is correct for most modems. If, however, you have difficulty querying your modem

(see Section 6.2.11, *Testing Your Modem*), this may be one area to which you should return to adjust settings.

In the **Connection Speed** field, you can select the highest baud rate for your modem (for example, a 56k modem can typically be set to 115200).

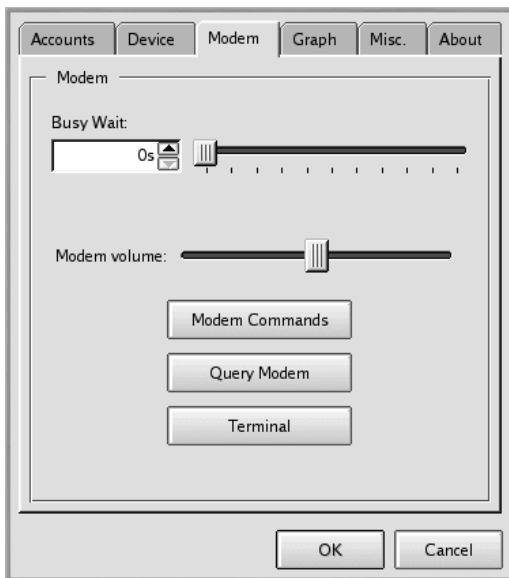
By default, **Use Lock File** is checked. This means that Kppp will lock the device while you're online, preventing others from using the modem.

Your entry in the **Modem Timeout** field establishes the time, in seconds, during which Kppp waits for a CONNECT response after dialing.

6.2.11 Testing Your Modem

From the **Modem** tab, you can test your modem's configuration (see Figure 6–25, *The Kppp Configuration Modem Tab*). By adjusting the slider next to **Modem volume**, you can modify the volume of your modem while you're dialing and connecting.

Figure 6–25 The Kppp Configuration Modem Tab



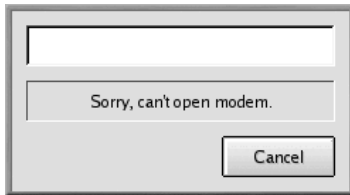
When you select the **Modem Commands** button, you'll be presented with the **Edit Modem Commands** dialog, which will allow you to modify how your modem dials, connects, and more.

Check Your Modem's Documentation

Check the documentation supplied with your modem for specifics on your modem's initialization string, dial string, and other settings.

Click on the **Query Modem** button to have Kppp search your system to identify the modem. A window similar to Figure 6–26, *Querying for the Modem* will open to show the progress of the query.

Figure 6–26 Querying for the Modem



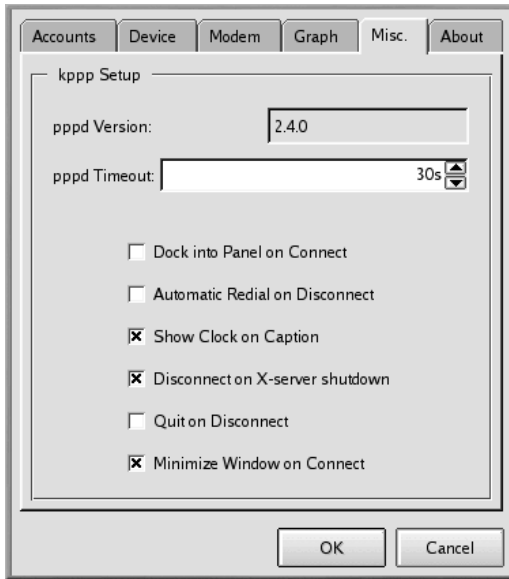
If the query was successful, you'll see the results in the dialog which follows, showing details which Kppp has picked up from your modem.

If you click the **Terminal** button, Kppp will open a mini-terminal, with which you can test your modem configuration.

6.2.12 The Graph and Misc Tabs

The **Graph** tab is for the configuration of the throughput graph. When using the modem, you can view a graph of the upload and download history. This configuration section lets you change the colors of that graph.

On the **Misc** tab, you can set options like automatic reconnection or disconnection, display of Kppp on connection, and more.

Figure 6–27 The Misc Tab

You can select from the following options:

- **pppd Timeout:** Specifies the time allowed to establish a connection before giving up.
- **Dock into Panel on Connect:** Select this to have Kppp displayed as an icon in the panel once you establish a connection. (This option overrides the **Minimize Window on Connect** selection.)
- **Automatic Redial on Disconnect:** Select if you want to have Kppp immediately redial your service if you're disconnected.
- **Show Clock on Caption:** Select this to see a clock displaying your connection time.
- **Disconnect on X-server shutdown:** If you choose this option, your connection will be terminated when your X server shuts down.
- **Quit on Disconnect:** When you've disconnected from your ISP, Kppp will also quit. Otherwise, you'll return to the initial Kppp window.
- **Minimize Window on Connect:** This will automatically minimize Kppp to the taskbar on connection.

On the **Graph** tab, you can modify the colors of the throughput graph, which is a visual chart showing you the bytes exchanged between your machine and your ISP while you're online.

The **About** tab displays information about Kppp, such as its authors, copyright, and credits.

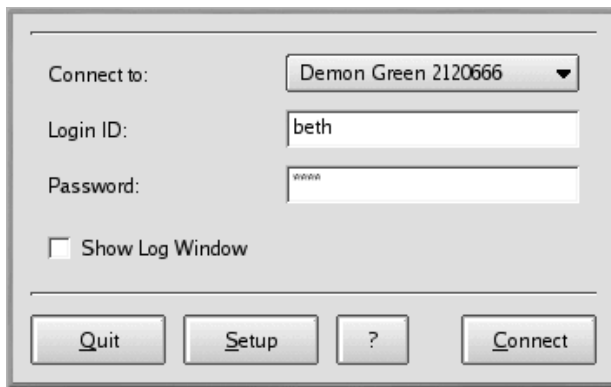
6.2.13 Connecting and Disconnecting with Kppp

Once you've configured Kppp, you're ready to try it out.

From the **Main Menu K** icon, go to **Internet** and click on **Kppp**. Before the application starts, you'll be required to enter your root password.

In the main dialog for Kppp which opens, enter the login ID and password for your Internet account (as in Figure 6–28, *The Main Dialog for Kppp*).

Figure 6–28 The Main Dialog for Kppp



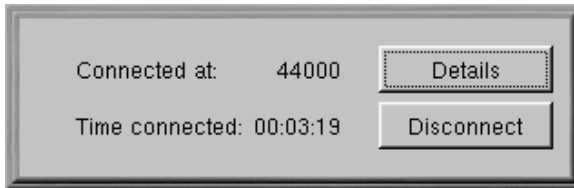
If you want to debug the configuration, or watch the progress of your connection, check the box marked **Show Log Window**.

To begin your online session, click on the **Connect** button. A window will open, showing the status of your connection, such as the initialization of your modem and the progress of the transaction. You can also open the log window by clicking on the **Log** button in this progress window.

Once you've established a connection with your ISP, Kppp will dock into the panel or become minimized on the Taskbar, depending on the options you selected when you configured the application.

To view statistics about your connection, such as the throughput rate and IP addresses, open the status window of Kppp and click on the **Details** button, which will open a window showing you statistics about your connection.

To disconnect, if the application is docked into the panel, click once on the icon to open the connection status window (see Figure 6–29, *Connection Status*). Then click on the **Disconnect** button.

Figure 6–29 Connection Status

If you chose to minimize the application to the Taskbar, then maximize the application and click on the **Disconnect** button.

7 The Web, Email, and News in GNOME and KDE

Once you've configured your Internet connection, you can view websites for information, entertainment, software, and more.

You can also send and receive email and participate in newsgroups. First, you'll have to configure your email and news applications, or clients. You can find two of the most popular mail and news clients in Netscape Communicator, which is included in Red Hat Linux.

In this chapter, you'll learn how to customize Netscape Communicator's browser, email, and news applications. A suite of applications, Communicator contains:

- **Navigator** — for finding information on the World Wide Web
- **Messenger** — for sending and receiving email and news
- **Composer** — for creating and publishing your own Web pages

We'll concentrate on Navigator and Messenger in this chapter.

Lynx: An Alternative Browser

You'll probably use Navigator for your Web browsing. But your Red Hat Linux system also includes a useful browser called Lynx. Lynx is a general purpose browser for character-cell displays; it will display the content of pages on the Web, but not the images. It's very fast, and can be an excellent alternative for you if you're interested in reading information, without having to wait for graphics.

To try Lynx, open a shell prompt and type **lynx** at the prompt. You'll find a list of options at the bottom of the screen. To go to a site, for example, use the [g] key and enter the website address or URL; to quit, press the [q] key.

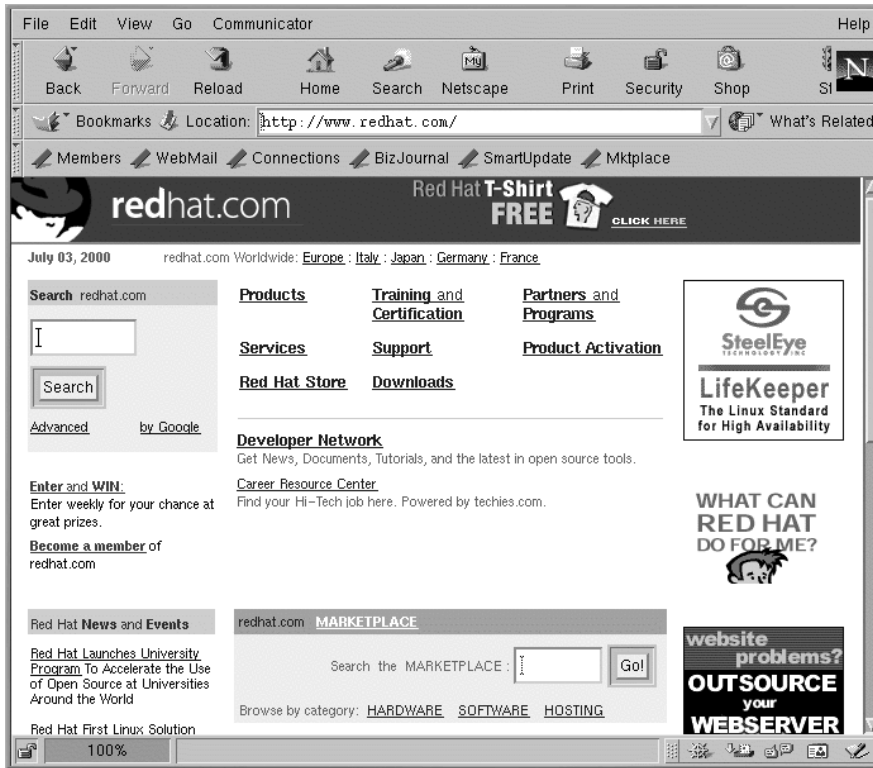
To learn more about Lynx, type **man lynx** at the shell prompt. If you want to print the man page, type **man lynx | col -b | lpr**.

7.1 Using Navigator in GNOME and KDE

You'll find the Netscape Navigator icon on the panel in GNOME and on the desktop in KDE.

To start Navigator, click once on the icon. When the browser first starts, you'll be asked to read and agree to the software license. Click on the **Agree** button to proceed. Once the browser starts, it should look like Figure 7–1, *A Typical Navigator Window*.

Figure 7–1 A Typical Navigator Window



The top row containing the icons is called the Navigation Toolbar. Selecting the icons will perform the following actions:

- **Back** — Returns you to a previously viewed page. To jump back several pages, left-click on the icon and hold down the mouse button to reveal a pulldown menu of previously viewed pages. Drag and release the cursor on the page to which you want to return.
- **Forward** — When you've moved back to previously viewed pages, selecting this button will take you forward, toward the more recently viewed pages.

- **Reload** — Refreshes the current page in the browser. This can be useful, for example, if you want to view a page that's frequently updated.
- **Home** — Selecting this button will immediately send the browser to the location specified as your start page. For more on how to set this feature to point to a different page, see Section 7.1.1, *Communicator Preferences*.
- **Search** — Sends you to a search engine page. Search engines allow you to locate information, people, merchandise, and more.
- **Print** — If you have configured a printer, selecting this button will print the current page.
- **Security** — Displays security information about the current page, as well as encryption information (which aids in security) about your browser.
- **Stop** — Stops loading the page into the browser.

You can visit other websites by clicking on hyperlinks in documents you view or by entering a URL in the address field on the toolbar. Addresses you type manually are stored in a history list and can be viewed by clicking on the down arrow next to the address field.

You can also click on **Go** in the Netscape main menu to see a list of sites you visited recently via hyperlink, search engine, or manual entry. You can return to one of these sites by clicking on it.

Figure 7–2 Menu and Location Options in Navigator



Opening Web Pages in a New Window

If you want to visit other sites, without losing your place on the page you're viewing, you can open a link in a new browser window by right-clicking on the link and selecting **Open Link in New Window** from the menu. (If you have a three-button mouse, or you selected three-button emulation during the installation of Red Hat Linux, you can also open a link in a new window just by clicking on the link with the middle mouse button.)

The following table provides keyboard shortcuts you can use in Navigator.

Table 7–1 Keyboard Shortcuts

Command	Shortcut	Command	Shortcut
Stop Page Loading	[Esc]	Undo	[Alt]-[z]
Reload	[Alt]-[r]	Print	[Alt]-[p]
Open Location	[Alt]-[l]	Open Page	[Alt]-[o]
New Mail Message	[Alt]-[m]	Edit Bookmarks	[Alt]-[b]
Find (on page)	[Alt]-[f]	Find (again)	[Alt]-[g]
New Window	[Alt]-[n]	Close Window	[Alt]-[w]
Quit	[Alt]-[q]	Save As	[Alt]-[s]
Jump Forward	[Alt]-[Right Arrow]	Jump Back	[Alt]-[Left Arrow]

Having Problems With Your Netscape Address Book?

Here are the instructions to use if the Address Book in Netscape crashes the application:

Open a shell prompt and type **grep locale \$HOME/.netscape/*.js** at the command line. It will return something similar to the following:

```
/home/username/.netscape/liprefs.js:user_pref
("ldap_2.servers.pab.locale", "en_US");
/home/username/.netscape/preferences.js:user_pref
("ldap_2.servers.pab.locale", "en_US");
```

Close all Netscape windows and remove the following lines from those files:

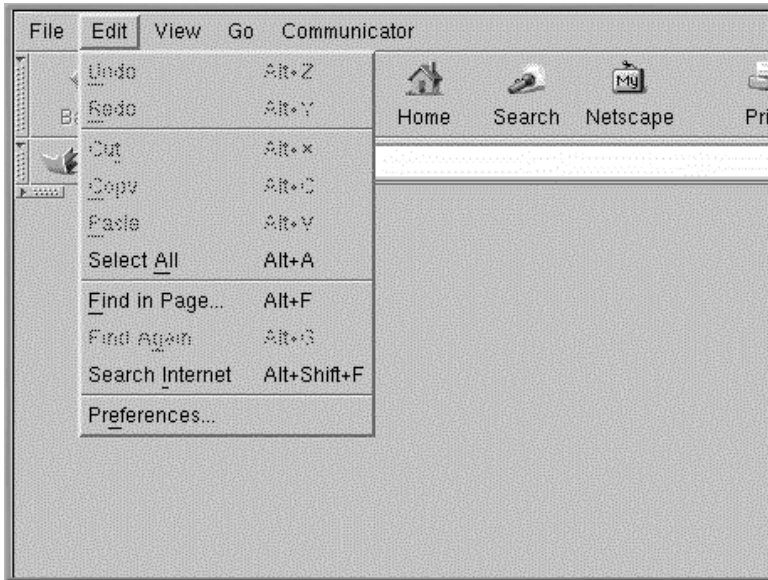
```
/home/username/.netscape/liprefs.js
/home/username/.netscape/preferences.js
```

7.1.1 Communicator Preferences

Communicator allows you to customize many of its features. You can select how a Web page appears, security levels, and more.

To enhance your browsing experience, you can customize Navigator. From the menu, select **Edit => Preferences** to open the options menu (see Figure 7-3, *The Preferences Item in the Edit Menu*).

Figure 7–3 The Preferences Item in the Edit Menu



The **Preferences** section is divided into subsections in the **Category** menu, including:

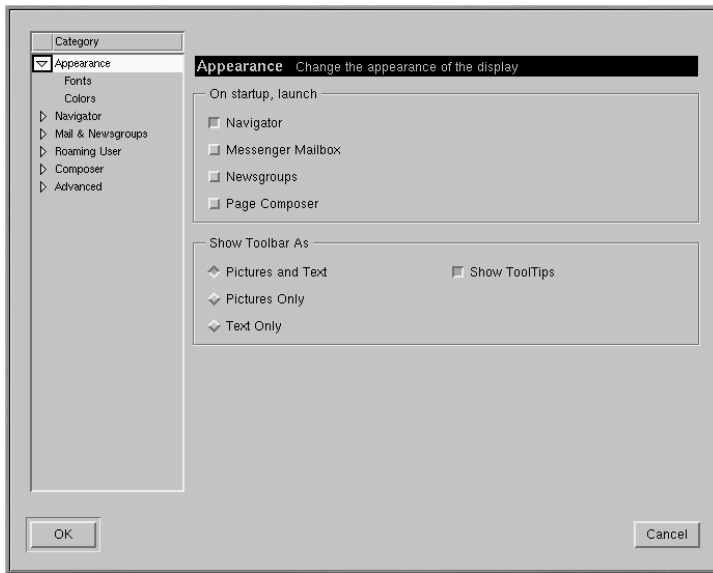
- **Appearance** — Allows you to modify the way Navigator physically appears, such as the colors or use of icons on the navigation bars.
- **Navigator** — Among other things, lets you specify your home page, or the page you see when the browser starts. Also allows you to modify how long to keep previously visited sites in a history, for quick viewing later.
- **Mail & Newsgroups** — Settings for using Communicator's email and news clients. To learn how to use these settings, turn to Section 7.2, *Email and News Settings for Messenger*.
- **Advanced** — Allows you to specify settings for acceptance of cookies, which are small pieces of information stored on your computer and used to identify you to the websites you visit. Also allows you to modify other settings.

Each of these sections in **Preferences** can be expanded by clicking on the arrow next to the item on the menu. Let's look at each section in more detail:

The Appearance Setting

Click on the arrow next to the **Appearance** category to reveal all the related menus (see Figure 7–4, *The Appearance Category*).

Figure 7–4 The Appearance Category



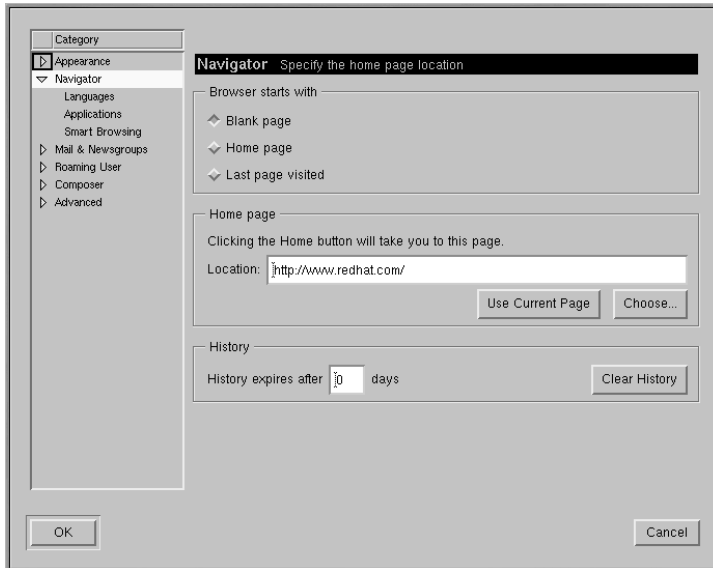
In this category of the menu, choose among the following by selecting the box next to its listing:

- **Appearance** — Here, you can select the features you want to launch on startup and determine how you want the toolbar to look.
- **Fonts** — In this section, you can decide which font or typeface you want to use by default. If you're having difficulty reading the type on sites you visit, you can adjust the typeface and size of type here. Select your fonts and their sizes from the drop-down lists; your selections will then be reflected in the page you're currently viewing, so you can see the effect.
- **Colors** — Lets you specify which colors you prefer for the text on pages, background, and links to other sites. You can also choose whether you want links to be underlined in a document (links will appear only as colored text if you deselect this option).

The Navigator Category

In the **Navigator** category you'll find options for starting the browser, languages, and related applications (see Figure 7-5, *The Navigator Category*).

Figure 7-5 The Navigator Category



On the first screen of the **Navigator** preferences, for example, you can choose to have the browser open with a blank page rather than automatically go to a site when it starts.

In the **Home page** section of this category, you can specify a page you want to call the home, or start page. You can also designate the page you're currently viewing as your home page by clicking on the **Use Current Page** button.

In the **History** section, you decide how long you want to retain previously visited sites in your history list. The history list can be used to jump to important sites you may have visited days earlier but neglected to bookmark. In the **History expires after** field, enter the number of days you want to retain URLs in your history file. To clear the file immediately, click on the **Clear History** button.

Using Your History File

To open your history file, from the menu go to **Communicator => Tools => History**.

The following category, **Mail & Newsgroups**, allows you to enter your account information to use Communicator's email and newsreader clients. For more on these settings, turn to Section 7.2, *Email and News Settings for Messenger*.

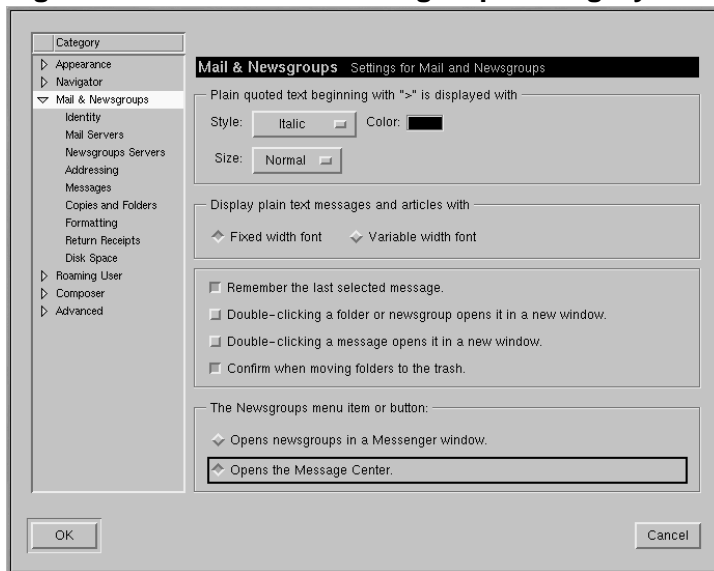
7.2 Email and News Settings for Messenger

To read and send messages, you'll have to enter your settings in the **Mail & Newsgroups** category of Communicator (**Edit => Preferences**). You'll also be able to save other related options in this category.

7.2.1 Entering Account Information

When you select **Mail & Newsgroups**, the category will expand, revealing sub-entries for your account information (see Figure 7-6, *The Mail & Newsgroups Category*).

Figure 7-6 The Mail & Newsgroups Category



General Options

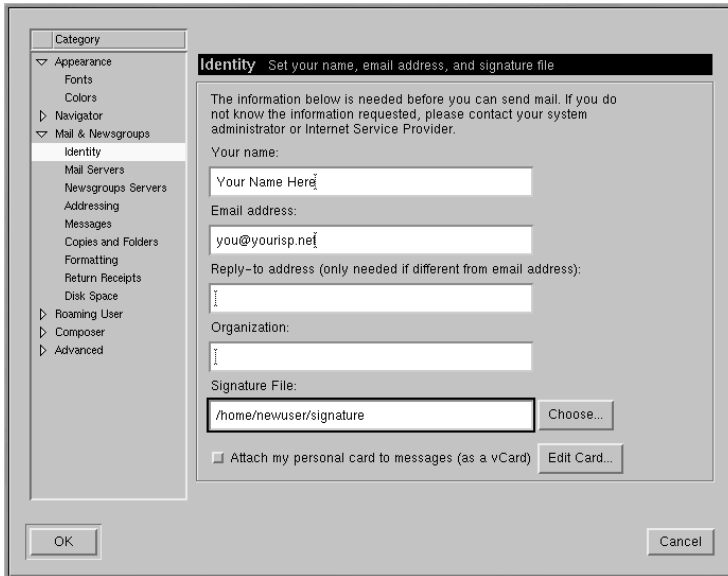
On the first dialog to the right of the categories, you can select how you want to have quoted messages appear. "Quoting" refers to material from a previous message, which appears as part of a follow-up message, such as a reply.

You can also select whether you want to view mail and news with a fixed width or variable width font. Selecting **Fixed width font** will preserve the display of fonts throughout messages and articles.

Account Identity

In the **Identity** category, enter your name, your email address, the name of your organization (if applicable) and the path to your signature file (see Figure 7–7, *The Identity Category*).

Figure 7–7 The Identity Category



Your Email Address

Often, your email address is your login name for your account, followed by the @ symbol, then your ISP's name (for example, "earthlink.net"). If you have questions about your address, you should check with your ISP.

If you want to direct users to reply to an email address which is different from the primary address you're entering in this category, enter that different address in the **Reply-to address** field. When users reply, they have the option of sending their replies to the reply-to address.

Creating a Signature

A signature is a brief note at the end of an email or newsgroup posting. Often a quote or joke, signatures say something about the author of the message.

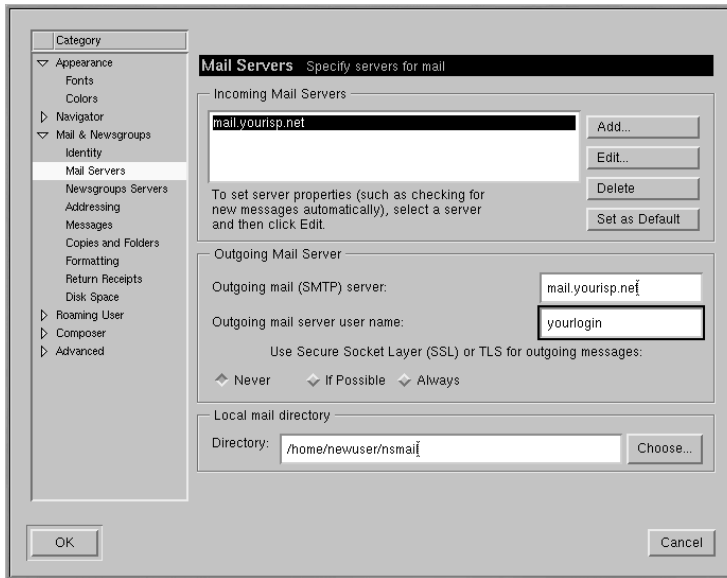
To create a signature, do the following, using the text editor Pico:

- Make sure you are in your home directory. At a shell prompt, type **pico signature.txt**.
- In the window which opens, type the text you want for your signature. You can write on more than one line; however, netiquette (conventions of politeness recognized on the Internet) frowns upon signatures longer than a line or two.
- Save the file by using the [Ctrl]-[X] keys. When you're asked whether you want to save the file, select the [Y] key for "yes."

Now, you'll have a new file, called `signature.txt`, in your directory. The full path to the file will be, for example, `/home/newuser/signature.txt`. When you write email or post a message on a newsgroup, the text in `signature.txt` will automatically appear at the bottom of your message.

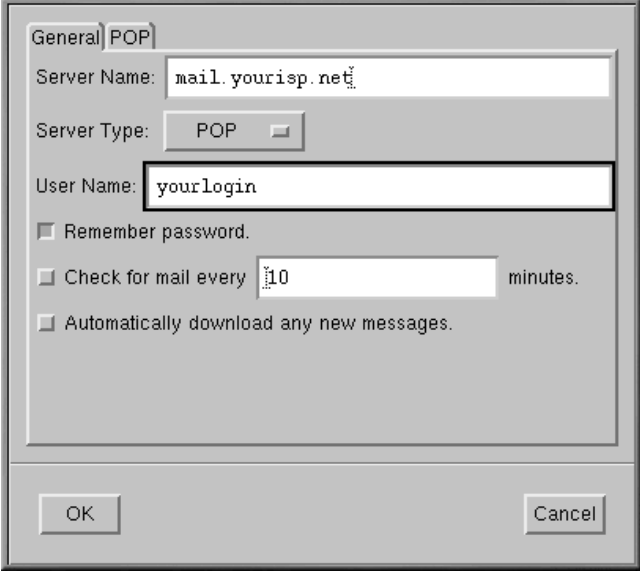
Mail Servers

In the **Mail Servers** category, enter the server name through which your mail is sent and delivered (see Figure 7-8, *The Mail Servers Category*).

Figure 7–8 The Mail Servers Category

To add your account information, select the **Add** button. A new dialog, similar to Figure 7–9, *Adding a Mail Server*, will open.

Figure 7–9 Adding a Mail Server



The screenshot shows a dialog box titled "Adding a Mail Server" with a "General" tab selected. The "Server Name" field contains "mail.yourisp.net". The "Server Type" dropdown menu is set to "POP". The "User Name" field contains "yourlogin". There are three unchecked checkboxes: "Remember password.", "Check for mail every 10 minutes.", and "Automatically download any new messages.". The "OK" and "Cancel" buttons are at the bottom.

On the **General** tab, enter:

- **Server Name** — The server from which your mail is sent and retrieved. Your ISP will be able to provide you with this information.
- **Server Type** — From this drop-down box, choose **POP**, **MoveMail**, or **IMAP**. Note that not all ISPs support all server types. Check with your ISP.
- **User Name** — Enter your ISP account login name.
- **Remember password** — Check this option if you don't want to be required to enter your password each time you check your mail.
- **Check for mail every _____ minutes** — Check this option and fill in the field to have Communicator check your ISP for new mail at specified intervals.
- **Automatically download any new messages** — When you check this option, Communicator will automatically download new mail from your ISP's mail server and place it in your **Inbox**.

On the **POP** tab:

- **Leave messages on server** — Check this option if you don't want your messages to be deleted from your mail server when you retrieve them. Messages will remain on your machine and will

not be deleted on the server machine. Note that this option is unchecked by default; check with your ISP before deciding you want to store mail on their server indefinitely.

- **When deleting a message locally, remove it from the server** — This option is also unchecked by default. If you select this option, mail will only be deleted off the server when you manually delete it on your machine.

When you're finished entering your mail account information, click the **OK** button to return to the **Mail Servers** window.

In the **Outgoing Mail Server** section, enter the name of the mail server. Your ISP should supply you with this information.

What is SMTP?

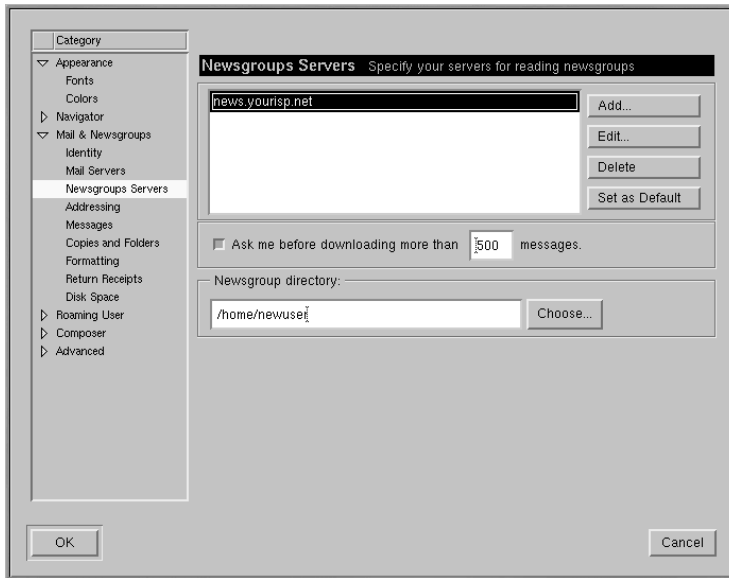
SMTP stands for Simple Mail Transfer Protocol, a protocol designed for the transfer of email messages.

The option to **Use Secure Socket Layer** refers to encryption technology. For more information about security issues, refer to Netscape's online help guide.

You can specify where you want your mail to be stored by either typing in the location in **Local mail directory**, or by clicking on the **Choose** button, and selecting a directory in the navigation window which opens. By default, mail will be stored in a directory in your user directory; if your name is *newuser*, for example, the path to the directory will be */home/newuser/nsmail*.

Newsgroups Servers

In the **Newsgroups Servers** category, enter the server name through which you can retrieve and post newsgroup messages (see Figure 7–10, *The Newsgroups Servers Category*).

Figure 7–10 The Newsgroups Servers Category

The procedure for entering the newsgroups server is somewhat similar to entering account information for email services. In this instance, you must enter the name of the server to which you'll connect for access to newsgroups. Your ISP should provide you with this information.

Figure 7–11 Adding a Newsgroups Server

To begin, click on the **Add** button. In the dialog which opens (see Figure 7–11, *Adding a Newsgroups Server*), enter the newsgroups server information supplied by your ISP.

The first option, for **SSL**, is similar to the reference to **Secure Socket Layer** in the mail configuration. Check with your ISP to determine if this option is necessary.

The second option, **Always use name and password**, will cause Messenger to request your user name and password before connecting to your newsgroups server. This can be useful in preventing unauthorized users from accessing newsgroups through your account.

Additional Options

The remainder of the categories in this section allow you to modify or accept settings for such options as message formatting, addressing, and disk space use.

HTML or Plaintext?

Among the options you have for sending and receiving messages, you'll find **Message formatting**, in the **Formatting** category. This category allows you to decide whether or not you want to compose and send mail in HTML format.

HTML (HyperText Markup Language) is the format in which Web pages and some other documents can be viewed. It can provide some rich formatting tools for your messages; for example, you can change the color or style of your fonts. However, not all users read their mail or news with applications that can adequately display HTML; netiquette also frowns on the use of HTML in mail and news.

Before sending your messages, make sure the recipients can read them. You can select the option **Ask me what to do...** in the section **When sending HTML messages...**, which will allow you to convert HTML messages to plaintext for easier reading by everyone.

Once you've finished entering your settings and options in **Mail & Newsgroups**, you're ready to send and receive messages. Select the **OK** button to save your settings and exit the **Preferences** dialog.

7.3 Reading and Composing Mail in Messenger

Once you have configured your accounts in Communicator, you can begin using Messenger to send and receive email and newsgroup postings (turn to Section 7.4, *Using Messenger to Read News* to learn how to set up your news preferences).

There are two ways to start Messenger:

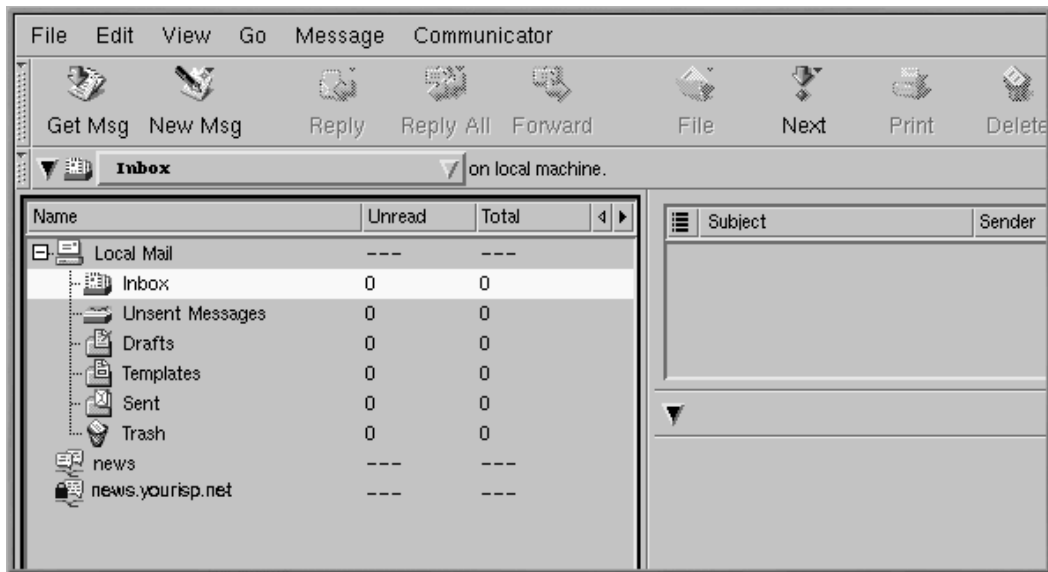
- Open Netscape, and press [Alt]-[2]

- From the **Component Bar** — and select the mail icon, which looks like:



The **Netscape Mail & Newsgroups** dialog which opens will look like Figure 7–12, *The Mail & Newsgroups Dialog*.

Figure 7–12 The Mail & Newsgroups Dialog



To compose email, go to the **Toolbar** and click on the **New Msg** icon:

You can also create email by right-clicking on the **Inbox** and selecting **New Message** from the menu. Or use your [Alt]-[M] keys to quickly open the **Compose** dialog for email.

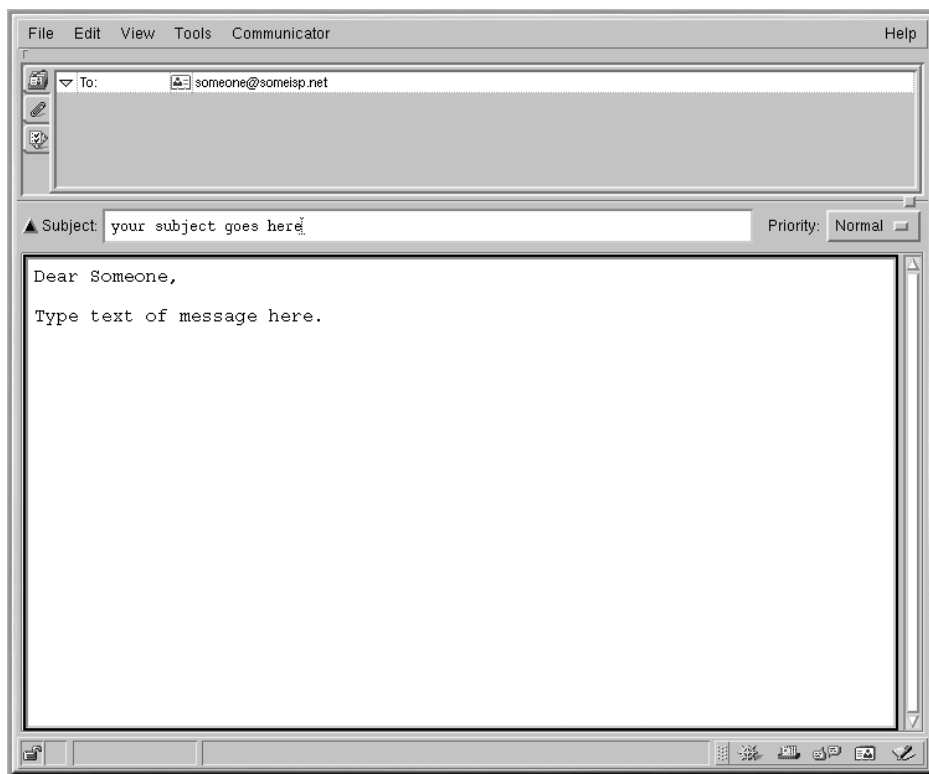
Creating Plaintext Messages

If you set your preferences to create email and newsgroup documents in HTML format, press the [Shift] and click on the **New Msg** icon to create a message in plaintext.

Alternatively, you can use press [Shift] and click on the **New Msg** icon to create HTML-formatted documents, if you selected to create your messages in plaintext formatting.

The **Compose** dialog will look like Figure 7–13, *The Compose Dialog for Email*.

Figure 7–13 The Compose Dialog for Email



Note that the title bar, at the top of the **Compose** dialog, will show the subject of your letter (as in **Compose: Type in your subject here** in Figure 7–13, *The Compose Dialog for Email*) once you save your message by clicking on the **Save** icon on the **Toolbar**.

In the address field, you can specify the following options:

- **To:** The primary recipient(s) of your letter
- **Cc:** To send a carbon copy to one or more recipients
- **Bcc:** To send blind carbon copies to recipients whose identity you want to remain private
- **Reply-To:** For specifying an email address to which you want replies sent
- **Newsgroup:** To send your message to a newsgroup
- **Followup-To:** To specify an email address you want to use for any posts to newsgroups

In the address field, enter the email address of your intended recipient, then press [Enter] to go to a blank address field. In each address field, you can specify address options by selecting one from the drop-down menu next to the address.

When you're finished typing in your addresses, press the [Tab] key to go to the subject field. Type the subject of your letter in this field and press the [Tab] key.

Now, type the body of your letter. When you're finished, click on the **Send** icon on the **Toolbar** to send your email.

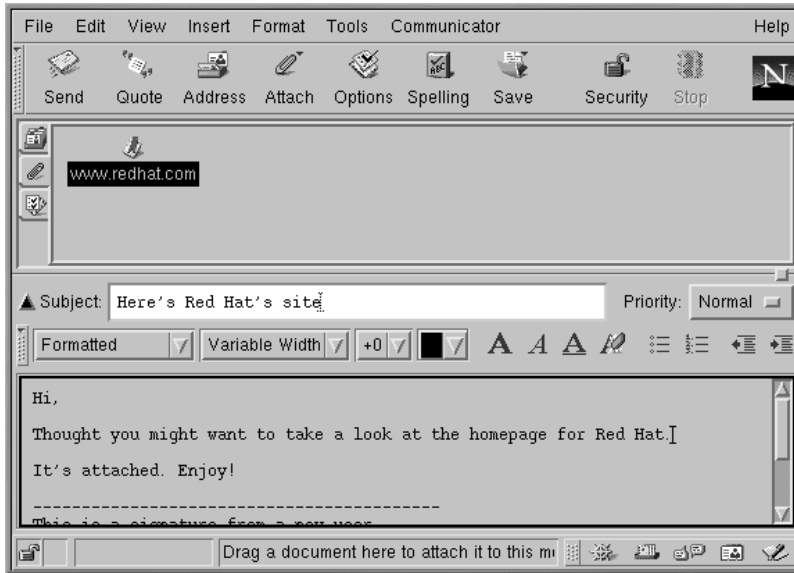
7.3.1 Other Email Options

If you want to send someone a Web page or a file on your computer, you can attach the document to your message. Click on one of the paperclip icons, either on the **Toolbar** or on the tab beneath the address field.

Figure 7–14 The Attach Web Page Dialog



When you have finished typing in the URL, click on the **Attach** button. In your letter, you'll see that the URL has been included with your letter (see Figure 7–15, *Email and Attached Web Page*).

Figure 7–15 Email and Attached Web Page

When you send your letter, the page associated with the URL will be sent with your letter.

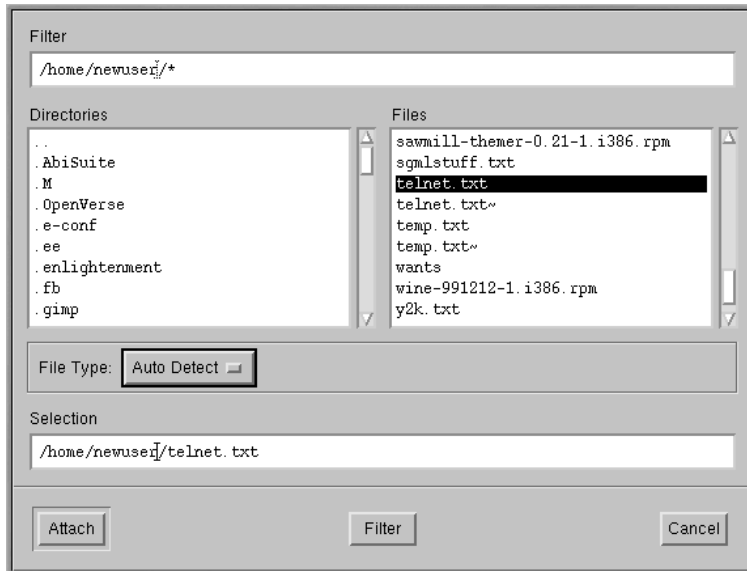
Drag and Drop Web Pages

You can also drag a URL from Navigator's **Location Toolbar** and drop it in your letter. In your letter, click on the paperclip icon under the address field. Now, from Navigator, go to the **Location Toolbar** and hold down your mouse button over the nearby bookmark icon, which looks like this:



Now, drag the icon to the attachments field of your letter.

In the same way that you attach Web pages to your letter, you can attach files on your computer. When you select **Attach** from the **Toolbar** or beneath the address field, choose **File** from the menu. The **Attach File** dialog will open, showing you the contents of your login directory (see Figure 7–16, *The Attach File Dialog*).

Figure 7–16 The Attach File Dialog

Drag and Drop Files

You can drag files from your desktop or from your file manager in the same way that you can drag URLs from Navigator. Just hold your mouse button over the file you want to attach, and drag it to the attachments field of your letter.

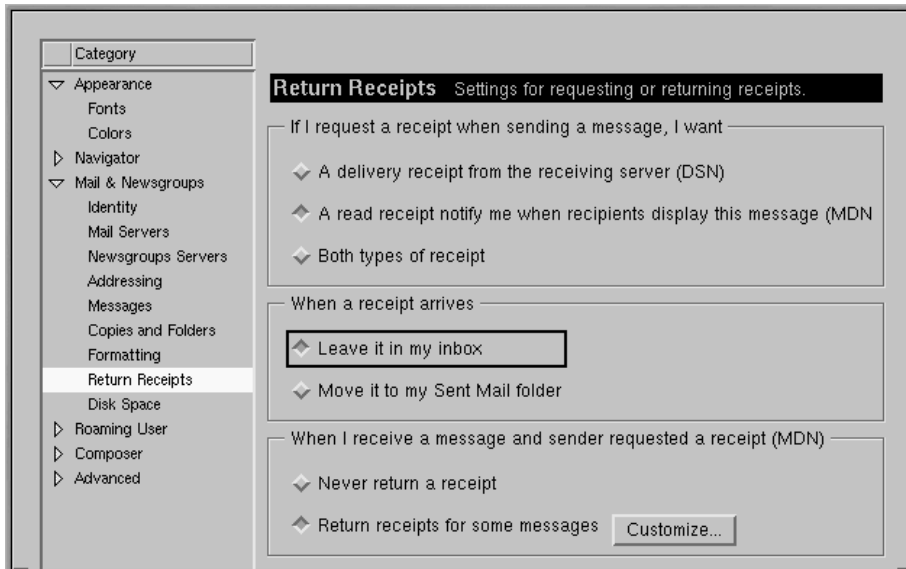
Messenger can let you know if your email was actually read, or even received. You can request a return receipt to confirm that your mail arrived and was opened. Return receipts may not work, depending upon the configuration of the mail server on the recipient's end.

Messenger supports two kinds of return receipts:

- Delivery receipts — notify you that your mail was delivered to the inbox of your intended recipient on their mail server
 - Read receipts — notify you that the recipient has opened your message
-

To specify preferences for return receipts, go to **Edit => Preferences => Mail & Newsgroups => Return Receipts**. In the dialog which opens (see Figure 7–17, *The Return Receipts Dialog*), choose how you want to use return receipts for mail you send and mail you receive.

Figure 7–17 The Return Receipts Dialog



To activate receipt notification, in your message go to **View => Options** and check **Request return receipt**. You can also click on the options tab beneath the attachments tab, or click on the **Options** menu on the **Toolbar**.

For more information about email options, such as address books, filtering email, and more, refer to Netscape Communicator's documentation, in the **Help** menu.

7.4 Using Messenger to Read News

One of the best methods to distribute information to a vast audience is through Usenet. Comprised of thousands of newsgroups, Usenet is used to exchange information, gossip, and more.

To read newsgroups, you'll need a **news reader**. One news reader is Netscape Messenger, which lets you read and post to newsgroups similar to the way you send email.

You can start Messenger in the following ways:

- Select **Communicator => Messenger** from the menu.

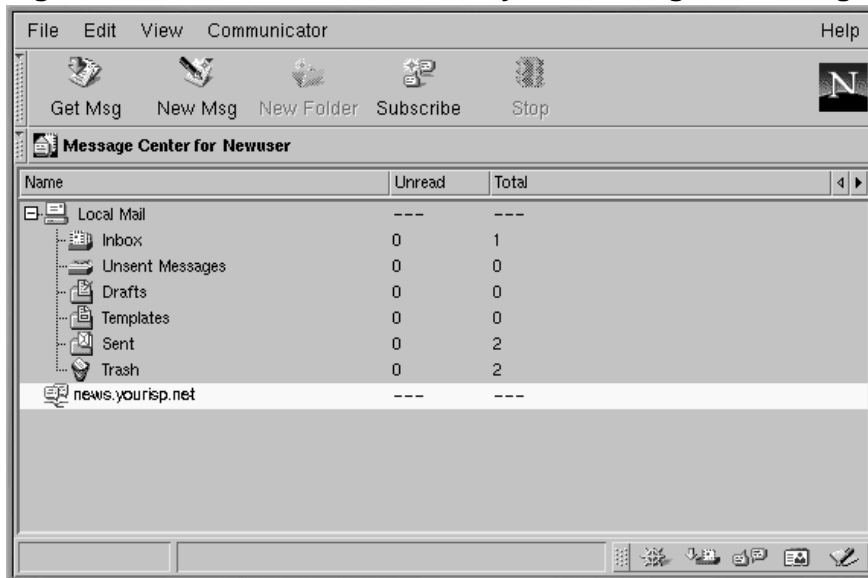
- Press [Alt]-[2]

- From the **Component Bar** — Select the newsgroups icon, which looks like:



The **Netscape Mail & Newsgroups** dialog which opens will look like Figure 7–18, *The News Server Entry in Messenger’s Message Center*.

Figure 7–18 The News Server Entry in Messenger’s Message Center



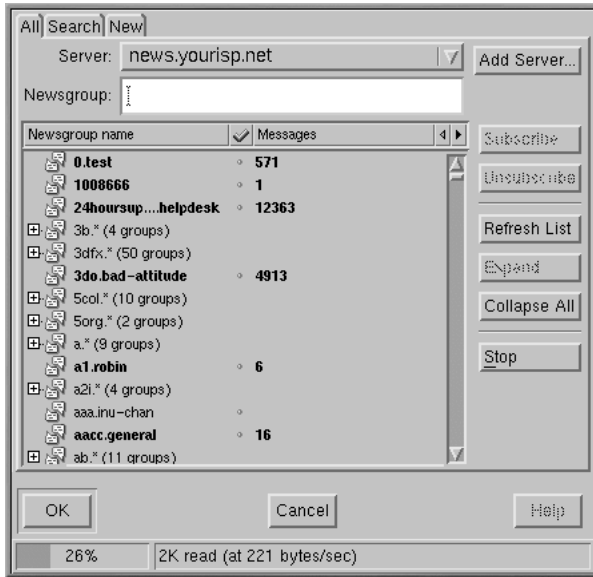
If You Haven’t Configured a News Server

If you haven’t already configured your news server, see *Newsgroups Servers* in Section 7.2.1.

Your next task is to download the list of newsgroups from your ISP’s news server, and to subscribe to those groups in which you have an interest. Be prepared to wait. Depending on the speed of your connection, downloading the list of many thousands of newsgroups can take some time.

After you select the newsgroups icon and download the list, click on **Subscribe** on Messenger’s menu, or right-click on the news server entry in the **Message Center** dialog, and select **Subscribe to Newsgroups**.

Figure 7–19 The Newsgroups Subscription Dialog

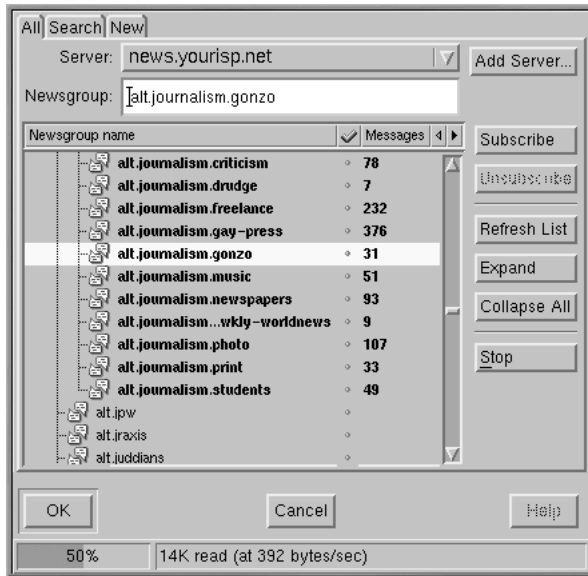


In the tabbed window which opens (see Figure 7–19, *The Newsgroups Subscription Dialog*), you'll be able to:

- See all of the available newsgroups to which you can subscribe (the **All** tab)
- Search for a particular newsgroup by full or partial name (the **Search** tab)
- View newsgroups which have been added by your ISP since you last downloaded (or refreshed) the full list of newsgroups (the **New** tab)

An indicator on the bottom of the dialog will show your progress as you download the complete list of newsgroups.

Groups shown in bold have new messages. Listings which are preceded with a "+" have subcategories.

Figure 7–20 Subscribing to a Newsgroup

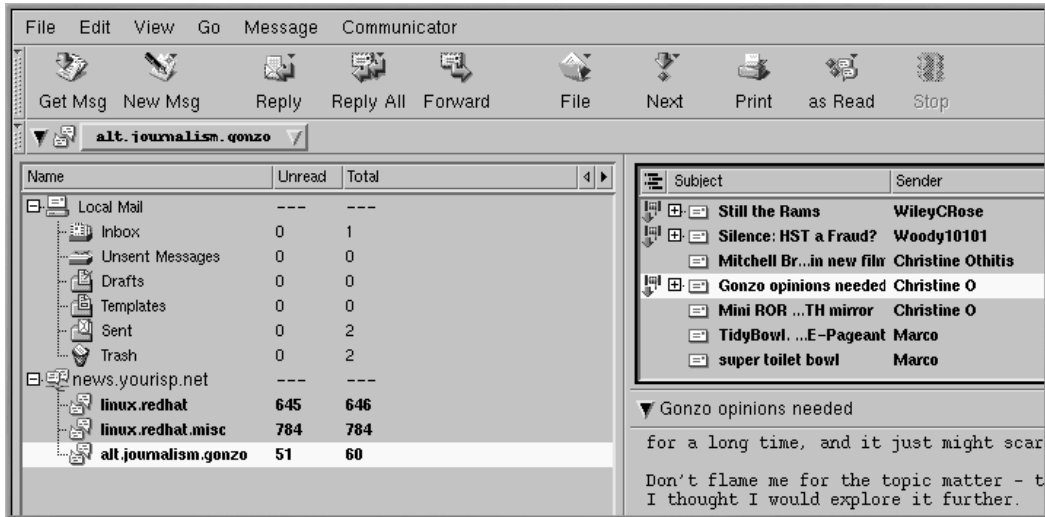
Click to highlight the name of a group that interests you, then click on the **Subscribe** button (as in Figure 7–20, *Subscribing to a Newsgroup*).

You can also search for newsgroups based on your interests in the **Search** dialog. For example, if you're an avid news and media fan, go to the **Search** tab. In the **Search For** field, type **journalism** and click on the **Search Now** button (or press [Enter]). Your search will likely result in quite a few newsgroups to which you can subscribe.

How to Unsubscribe

You can unsubscribe to newsgroups by highlighting your choice in the News-group Subscription dialog box and clicking on **unsubscribe**.

Figure 7–21 Subscribed Newsgroups in Messenger



When you are finished subscribing to newsgroups, click on **OK**. Your selections will appear in Messenger's main dialog (see Figure 7–21, *Subscribed Newsgroups in Messenger*). Note that the **Total** category represents the total number of messages in the group; the **Unread** category represents the number of messages you have not read.

To view a newsgroup, double-click on its name. In the top right pane of the dialog, you'll see the messages' subjects; in the bottom right pane, you'll be able to read the associated messages.

To write a message to your selected newsgroup, click on **New Msg** on the menu, or go to **File => New => New Message**. Like writing email, enter your message in the **Compose** dialog which opens and send your message. It will be posted to your current newsgroup.

Selecting one of the menu items or right-clicking in the message body to perform the following tasks on posted messages:

- **Reply** — Send a reply to the poster either in the newsgroup or privately, by email
- **Reply All** — Reply to both the poster and the newsgroup
- **Forward** — Forward the message to an email address
- **File** — Place the message in a Messenger folder, such as your **Inbox**
- **Next** — Move to the next message on the list

- **Print** — Print the message
- **as Read** — Mark the message as read, in which case it would no longer be highlighted as a new, or unread, message

There are other applications which can be useful and fun ways to chat and exchange information on-line. For example, you may wish to explore applications such as messengers and IRC (Internet Relay Chat) clients. But the staples of browsing (email and news reading) may keep you entertained and busy for quite some time.

8 Audio, Video, and General Amusement

8.1 Configuring a Sound Card

Sound capability is included, but is not configured to run automatically when you install Red Hat Linux. If you want to hear sound, you'll need to configure your sound card with the `sndconfig` utility.

To use `sndconfig`:

1. From a shell prompt, use the `su -` command to become root.
2. Type `sndconfig` at the command line.

To navigate through the **Yes**, **No**, **Cancel**, and **option** buttons, use your [Tab] and [Enter] keys.

Is Your Sound Card Supported?

Many sound cards are supported for Red Hat Linux, but there are sound cards that are not completely compatible, or even compatible at all. If you're having trouble configuring your sound card, check the Hardware Compatibility List at <http://hardware.redhat.com/> to see if your card is supported.

The `sndconfig` utility probes your system for sound cards. If the utility detects a plug and play sound card, it will automatically try to configure the correct settings by playing sound samples. If you can hear the samples, just select **Ok** when instructed and your sound card configuration is complete.

If the probe doesn't find any cards, you'll be presented with a list from which you can pick your card. Use the up and down arrow keys to scroll through the list. If your card is listed, highlight it, then press [Enter] (or [Tab] to the **Ok** button and press [Enter]).

Your next task will be to select the correct I/O port, IRQ, and DMA settings. These settings are determined by the jumper settings of the sound card. You can find information about these settings in your sound card documentation. If you share your machine with Windows, you can also find your sound card's settings in the **Device Manager** tab, in the **System** section of your **Control panel**.

Once you've selected the right settings for your card, you'll be presented with sound samples. If you hear the samples, select **Ok** and sound configuration is complete.

After your card is configured, type `exit`. You will be returned to your user account.

8.1.1 If sndconfig Doesn't Work

If `sndconfig` doesn't work (if the sample doesn't play and you still don't have audio sounds), there are alternatives, although they're not quite as simple as running `sndconfig`. You can edit your `modules.conf` file as discussed below (this strategy is not recommended for novices), or refer to the documentation that came with your soundcard for more information.

If your soundcard is not a plug and play card, you can manually edit your `/etc/modules.conf` file to include the sound card module that it should use, for example:

```
alias sound sb
alias midi opl3
options opl3 io=0x388
options sb io=0x220 irq=7 dma=0,1 mpu_io=0x300
```

8.2 Speakers, Headphones, and Sound Etiquette

Most computers have a plug on the back of the CPU designated for speakers and headphones. If you have configured your sound card, any system or website sounds should play through the speakers or headphones.

Your CD-ROM probably has a plug near it as well, so you can listen to music CDs through the CD-ROM drive. See Section 8.3, *Playing CDs*.

Regardless of how you choose to listen to music or other sounds, you should remember that there may be other people working near you who aren't interested in hearing your computer. Be courteous and keep the volume down. Even headphones can "bleed" noise and disturb others.

Add the Mixer Applet (**Main Menu => Applets => Multimedia => Mixer**) to your panel so you can control system volume. Click on the speaker icon in this applet to mute or activate sound and use the slider bar to control volume level. Note that the CD-ROM probably has its own volume control next to the CD drawer on your computer.

8.3 Playing CDs

In KDE or GNOME, go to **Main Menu => Multimedia => CD player** to open the CD player, or just put a music CD in your CD-ROM to start the player automatically.

Figure 8–1 GNOME CD Player Interface



The CD player interface acts like a standard CD player, with play, pause, and stop functions. A volume control slider is located at the bottom of the interface. You can also edit the track listings for your CDs and change the way the utility functions by clicking on the **Open Track Editor** and **Preferences** buttons and making your selections.

Set your preferences to use CDDDB and it will look up the name of the CD and its songs from an extensive online database and list them in the GUI. The first time you play a CD, you will need to be online for this feature to work; the information will be stored and displayed in the future whether you are online or not. This isn't a requirement — it's just a convenient feature.

8.4 Configuring a Video Card

You probably configured your video card during installation (see the *Official Red Hat Linux x86 Installation Guide*), but you can change your video configuration settings at any time using the Xconfigurator utility. You will want to do this if you, for example, install a new video card.



Xconfigurator will overwrite your system's original video configuration file. As a safety measure, be sure to make a backup of the `/etc/X11/XF86Config` file before running Xconfigurator.

To run Xconfigurator, log in as root and type **Xconfigurator** at a shell prompt. Follow the instructions which will appear on the screen. Make your selections using the [Tab] and [Enter] keys.

When you have finished reconfiguring your video card, log out of root and log back in to your user account.

Cameras, scanners, and other peripherals can be used with Red Hat Linux, but are not discussed in this manual. The Linux Documentation Project is an excellent source of information for using peripherals

and much more. Visit their site at <http://www.linuxdoc.org> and search the HOWTOS for the information you want.

8.5 Games

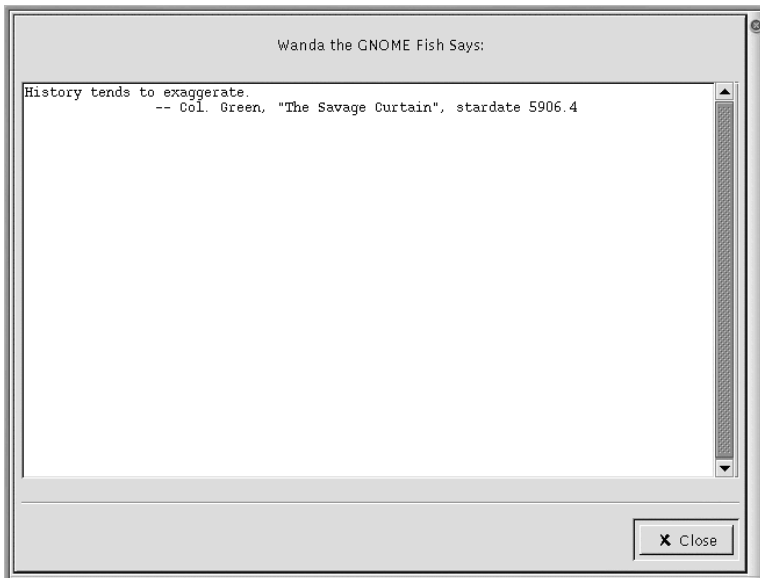
In both GNOME and KDE, go to **Main Menu => Games** to see a list of games included with Red Hat Linux. Many games include rules and tips within the menu options.

Additional games are available online; <http://www.lokigames.com/> and <http://www.linuxquake.com/> are two popular sites. Also, try searching for "linux games" using a search engine on the Web.

8.6 Amusements

In GNOME, go to **MainMenu => Applets** and look through the applets available in **Amusements**, **Clocks**, and **Utility**. **Fish** will open a dialog box displaying a quote that changes every time you click on the icon. **gEyes** will add two eyes to your panel that follow your cursor around the screen. **Gnome Weather** (which is under **Utility**) will dock a button on your panel that displays a miniature weather report.

Figure 8–2 Wanda The Fish



The text editor **Emacs** has several hidden surprises, too. Open the application with **Main Menu => Applications => Emacs**. Press [Alt]-[x]; then type the word **doctor** to open the application's "psychiatrist." Also in **Emacs**, press [Esc]-[x] and then type "yow" to see a quote at the bottom of the screen. Press [Esc]-[x] and type "psychoanalyze-pinhead" and **Emacs** displays all the quotes in its database (press [Ctrl]-[C] to stop).

9 A Short Introduction to the GIMP

The GNU Image Manipulation Program (GIMP) can help you create, alter, manipulate, and enhance digital image files -- photographs, scanned images, computer-generated images, and more. This chapter is intended to give you a quick overview of the GIMP and its more common applications.

Like other fields, image manipulation has its own vocabulary. This chapter cannot possibly provide complete documentation for all of the terms and concepts needed to completely understand the GIMP. If you want to learn more, a variety of books are available which document the GIMP and its capabilities, as well as the background concepts of image manipulation. Please refer to Section 9.3, *Additional Resources* if you need more information about the GIMP.

If you cannot create the right effect with the tools that the GIMP provides, and you are not afraid to write scripts in the Scheme scripting language, you can add a new Script-Fu to the GIMP. A Script-Fu is somewhat analogous to a macro in a word processing or spreadsheet application; it applies a set series of effects (filters or other GIMP capabilities) to a graphic or piece of text. Anyone can use the pre-written Script-Fus included with the GIMP, but you can also write your own. See Section 9.3, *Additional Resources* for more sources of information about Script-Fus.

The GIMP can do a lot of things, but it has some limitations. Graphic artists who create images for print media may find the GIMP lacking, or just more difficult to use, for pre-press applications.

For example, the GIMP cannot (yet) work in the CMYK (cyan, magenta, yellow, and black) colorspace, which is generally used for printing color graphics. The GIMP instead uses the RGB (red, green, and blue) colorspace, which should be familiar to people who have created graphics for the Web.

Since the GIMP is well-suited for creating graphics for the Web, that is what we are going to do in this chapter. First, we will edit a photo for display on a Web page. Then we will create a background image, which will be tiled on the background of our Web page. Finally, we will use the GIMP to create a title image for the Web page.

Before we start, you will need to know some basics: how to create and save files, and how to use the Toolbox and Dialogs.

9.1 GIMP Basics

To use the GIMP, you will need to know some of the basics. From a shell prompt, you start the GIMP using the command `gimp`. Start the Gimp in GNOME by going to **Main Menu => Programs Graphics => The GIMP**. In KDE, go to **Main Menu => Programs => Graphics => The GIMP**.

Like many applications, the GIMP provides more than one method to accomplish tasks. Generally, there are three ways to work in the GIMP:

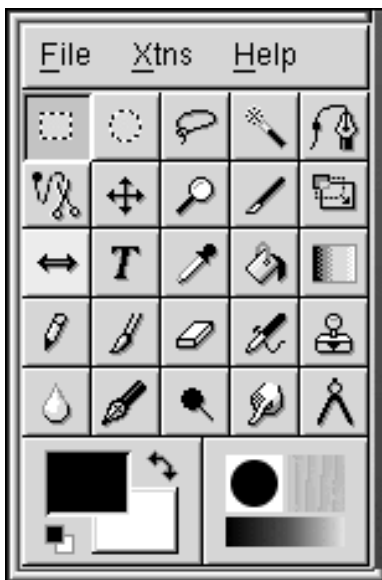
- By right-clicking on an image, which will display a set of menus containing most of the GIMP's many capabilities
- From the Toolbox, using the tools or the **File** or **Xtns** pulldown menus (see Section 9.1.1, *The Toolbox*)
- With keyboard shortcuts (see Section 9.1.5, *Helpful Keyboard Shortcuts*)

When you start the GIMP, you will see the Toolbox.

9.1.1 The Toolbox

The GIMP Toolbox is a palette of commonly used GIMP tools:

Figure 9–1 The Toolbox



You can minimize the Toolbox (send it to the panel), but if you close the Toolbox, you are closing the GIMP.

If you move your mouse over the individual buttons in the Toolbox, a pop-up dialog will appear to identify the tool's purpose.

Click on the button for the tool you want to use in the Toolbox. The button will then appear recessed, to indicate that it is the active tool. The GIMP provides tools that will crop, zoom, erase, smudge, draw, measure, blur, and more.

Generally, you use a tool on an image by activating the tool and then clicking and dragging on your image. If a portion of the image is selected, then the tool will only work on the selected portion. Selections are identified by a moving dotted-line border, called "marching ants."

Many of the tools have options. Double-clicking on the tool's button will display the **Tool Options** dialog for that tool.

Tools in the Toolbox



Select rectangular regions

This tool is used to select rectangular portions of an image. If you click on the image, then press and hold [Shift] while you are dragging, the rectangle will be a square. If you click on the image, then press and hold [Ctrl] while you are dragging, your starting area will be the center of the rectangle (normally the starting point is at an edge of the rectangle).



Select elliptical regions

This tool is used to select circular or oval portions of an image. If you click on the image, then press and hold [Shift] while you are dragging, the ellipse will be a circle. If you click on the image, then press and hold [Ctrl] while you are dragging, your starting point will be the center of the ellipse (normally, your starting point is at an edge of the ellipse).



Select hand-drawn regions

This tool, also known as the lasso, is used to draw a freehand selection. Click and drag to draw a selection. When you get back to where you started, release the mouse button.



Select contiguous regions

This tool, also known as the fuzzy selection tool or magic wand, is used to select portions of an image based on color values. When you click once on an image with the magic wand active, contiguous pixels with color values close to that pixel will be selected. If you click and drag the magic wand, a larger group of pixels will be used as the starting point.



Select regions using Bezier curves

This selection tool is similar to the freehand select tool, but it allows you to customize your selection. If you need to be very precise when you are selecting a complicated object, the Bezier tool is probably the right choice for the job.

To create a Bezier selection, click to create control points in a connect-the-dots pattern around your selection. Put a control point at every corner or angle of your selection. Click on the first control point you created to close the selection. Now you can move the control points and create curves between them to modify your selection.

To move control points, hold down the [Ctrl] key and drag the point you want to move.

To create curves, click and drag on a control point. As you drag away from the control point, you will see handles appear. Click and drag on the handles to control the shape of the curve.

If you only want to affect the curve on one side of a control point, hold down the [Shift] key and drag on one of the handles.

Once you have finished modifying the Bezier selection, click inside the selection to activate it.



Select shapes from image

The **Select shapes from image** tool (or intelligent scissors) is intended to improve upon your selection and automatically select the correct shape. This tool occasionally behaves unpredictably, but give it a try. Obviously, this type of selection is easier for the GIMP to handle if the area that you want to select has a distinct edge.

Click on the intelligent scissors tool in the toolbox to activate it. Then, as if you were using the Bezier tool, click on the image to draw a connect-the-dots pattern around your intended selection. The intelligent scissors tool will try to guess what you are selecting, so the lines it draws between the control points will (hopefully) follow the edge of your selection instead of being straight lines between the dots. Click on the first point to complete the selection.

To refine your selection, you can move the control points by clicking on one and dragging. Once you are happy with the selection, click inside it to activate it.



Move layers and selections

The move tool is used to move a selected region.

Immediately after you have created an active selection, if you move your mouse cursor over it, you will see the mouse cursor turn into the move symbol. Click and drag on the selection to move it. This technique works even if the move tool is not activated in the Toolbox.

With the move tool activated, if you click and drag on your image, you will move the entire image (or the active layer). With the move tool activated, if you press [Alt] and then use the arrow keys, you can move the currently active selection outline, one pixel at a time.



Zoom in & out

Also called the magnifying glass, the zoom tool is used to enlarge (by clicking) or reduce (by [Ctrl]-clicking) the image. You can also click and drag to zoom in on a specific region in the image.

Alternatively, the [=] key on your keyboard will zoom in and [-] will zoom out.



Crop the image

The crop tool, which resembles a scalpel, is used to cut away portions of an image. Click and drag to draw a rectangular selection that you want to keep. The **Crop & Resize Information** dialog will appear. Click on the **Crop** button on the **Crop & Resize Information** dialog to remove everything outside the selection. Alternatively, click on the **From Selection** button on the **Crop Selection** dialog to make a customizable crop box appear on the image. The control squares at the corners of the box can then be individually moved to refine the crop selection.



Transform the layer or selection

The transform tool can be used to rotate, scale, shear, or change the perspective of an image or selection. Double-click on the **Transform** button to display the **Transform Tool** dialog. Choose which action you want to perform on the image or selection. Move the mouse cursor over the selection or image and you will see the mouse cursor change into the transform tool circular arrows icon. Then click and drag on the image or selection to perform the action that you have chosen.



Flip the layer or selection

The flip tool is used to flip (or produce a mirror image) of an image or selection.



Add text to the image

The text tool is used to add text to the image. Select the text tool and then click on the image. The **Text Tool** dialog will appear. Set the parameters for the text you want to add, type your words into the field at the bottom of the dialog, and click on **OK** to add the text. Please note that the fonts displayed by the **GIMP** are the fonts that are accessible to X on your system.

When you add text to an image, the text becomes the active selection. If you move your mouse cursor over the text, you will see the move icon, and you can click and drag to move the text to an appropriate spot on the image.



Pick colors from the image

The color picker is used to choose a color from the image. The **Color Picker** dialog will display the individual RGB values and the hexadecimal value for the selected pixel. Additionally, the active color box at the bottom of the Toolbox will change to the value of the chosen pixel.



Fill with a color or pattern

The bucket or bucket fill tool is used to fill a selection with the active color or with a pattern.



Fill with a color gradient

The blend or gradient tool is used to fill a selection with a range of colors.

To add a gradient to a selection, first double-click on the gradient button to display the gradient **Tool Options**. The **Blend** pulldown menu sets the range of colors to apply. You can blend from the foreground color to the background color or vice versa, you can blend from a color to transparency, or you can choose from the many custom gradients available in the **GIMP**.

You can set the "shape" of the gradient with the **Gradient** pulldown menu on the gradient **Tool Options**. You can also set whether the gradient repeats or not, using the **Repeat** pulldown menu.

Once you have chosen a gradient to use, click and drag on your selection, or on the entire image, to apply your gradient. For most gradients (but not all), the length of the drag affects the range of the gradient; a short drag will equate to a compact gradient with more defined edges between colors, while a long drag will produce a wider gradient with less clearly defined edges.



Draw sharp pencil strokes

The pencil is used to draw lines, curves or shapes with sharp, defined edges. See *The Brush Selection Dialog* in Section 9.1.1 for instructions on selecting brushes for use with the pencil.



Paint fuzzy brush strokes

The paintbrush is used to draw lines, curves, or shapes with soft edges. See *The Brush Selection Dialog* in Section 9.1.1 for instructions on selecting brushes for use with the paintbrush.



Erase to foreground or transparency

Obviously, the eraser is used for erasing. See *The Brush Selection Dialog* in Section 9.1.1 for brushes that can be used with the eraser.



Airbrush with variable pressure

The airbrush tool works much like an actual airbrush. You can control how much "paint" is "sprayed." High settings are darker and low settings are lighter and more uneven. See *The Brush Selection Dialog* in Section 9.1.1 for instructions on selecting brushes.



Paint using patterns or image regions

The clone or stamp tool is used to select portions of the image, which are then used as "paint." The clone tool can be used to remove unwanted portions of an image, by painting over them with patterns from the image itself.

Click on the clone tool in the Toolbox to activate it. Then hold down the [Ctrl] key and click on the place in the image which will supply the pattern for painting. Release the [Ctrl] key. Click and drag to apply the selected pattern to the image. A + sign will follow along with the pencil icon of the clone tool. The + sign starts at the spot you picked and indicates where the "paint" is coming from in the image.



Blur or sharpen

The blur/sharpen tool is used to paint a blurring or sharpening effect on specific portions of an image.



Draw in ink

The ink pen is used to draw lines similar to those drawn using a pen; the line's thickness depends upon the speed of the drawing device (a pen tablet or your mouse). The pen's **Tool Options** include settings for the size and shape of the pen.



Dodge or Burn

The dodge/burn tool is used to adjust intensity values (the amount of white in each pixel) in an image.

The **Tool Options** for the dodge/burn tool allow you to set whether you want to dodge (increase the intensity) or burn (decrease the intensity). The **Exposure** slider sets how much you want to change the intensity, from 0 to 100%. The **Mode** sets which pixels will be affected: **Highlights**, pixels with high intensity values; **Midtones**, pixels with medium intensity values; or **Shadows**, pixels with low intensity values. The dodge/burn tool is used with a particular brush; see *The Brush Selection Dialog* in Section 9.1.1 for more information about brushes.



Smudge

The smudge tool is used to blur or smear an image with the currently selected brush. See *The Brush Selection Dialog* in Section 9.1.1 for more information on brushes.



Measure distances and angles

The measure tool can be used to measure a distance on an image, or to measure an angle from the horizontal. Double-click on the measure tool and select **Use Info Window** if you do not see the measurements window.


Colors

At the bottom of the Toolbox, you will see the active colors display:

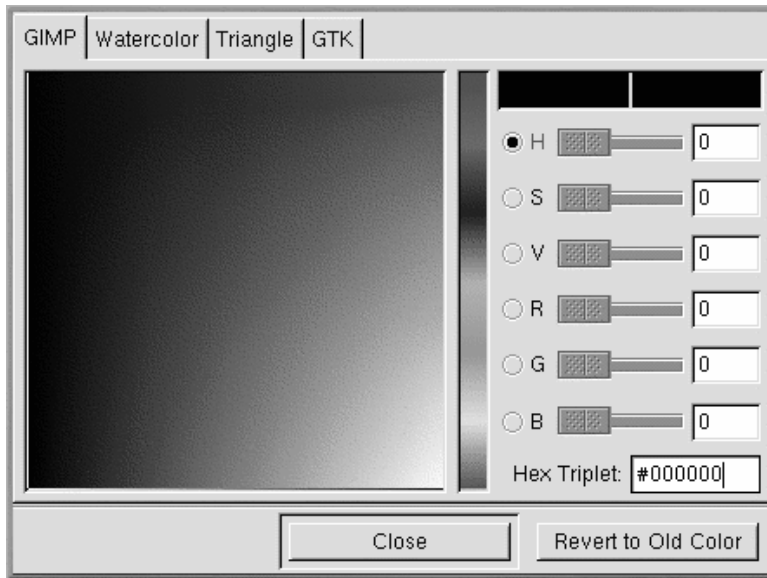
Figure 9–2 The Active Colors



The active color square is depressed; you can see in Figure 9–2, *The Active Colors* that the black foreground color square is the active color.

By default, black is the active foreground color and white is the active background color. To "flip" the foreground and background colors, click on the  icon.

Click on the active color box to display the **Color Selection** dialog:

Figure 9–3 The Color Selection Dialog

You can select a color "freehand." Choose one of the radio buttons for hue, saturation, value, red, green, or blue; pick a range of color from the middle bar; and then pick a specific color from the color square.

You can also just type in the correct RGB values or the hexadecimal value for the color you want to select.

As you choose colors by clicking on the color square, or by typing in exact values, you will see the active color box on the Toolbox change to the new color.

Color selection can provide you with some very complicated options. If you are interested in the GIMP's color capabilities, you should check out some of the more in-depth resources in Section 9.3, *Additional Resources*.

The Active Brush, Pattern, and Gradient

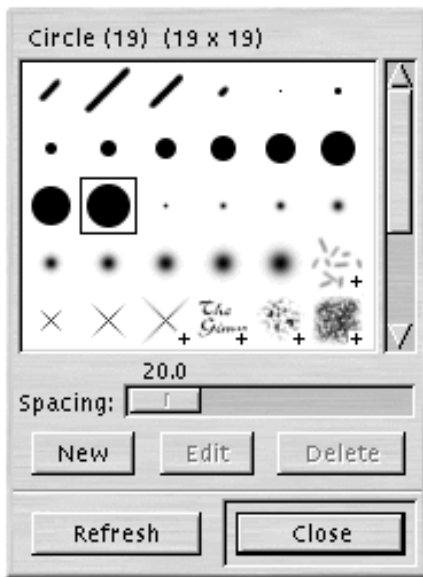
A square on the bottom right of the Toolbox displays the active brush, pattern, and gradient:

Figure 9–4 The Active Brush, Pattern, and Gradient

If you want to choose a different brush, pattern, or gradient, click on either the active brush, pattern, or gradient to display the palette of choices for each. Click on a choice from the palette to make it the active brush, pattern, or gradient.

The Brush Selection Dialog

When you use GIMP drawing tools, you can modify the attributes of the line you are drawing by selecting a particular brush.

Figure 9–5 The Brush Selection Dialog

To display the **Brush Selection** dialog, click on the active brush on the Toolbox. The **Brush Selection** dialog looks like Figure 9–5, *The Brush Selection Dialog*:

Click on a brush in the palette to select it. Click and hold the mouse button down to see more detail for certain brushes.

Selecting Areas in an Image

The GIMP provides six selection tools; they are the first six buttons in the toolbox. You can use these selection tools by clicking and dragging on the portion of the image you want to select. The GIMP also provides ways to modify your selection.

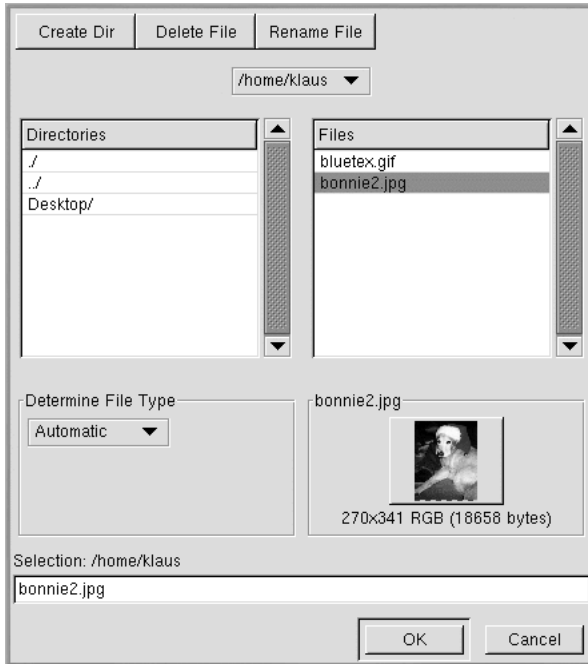
These modifications will only work while your selection is active. You can recognize an active selection by the moving dotted line around its perimeter (the marching ants).

- When the mouse cursor is on your selection, the cursor becomes the move symbol. If you click and drag on the selection, you can move the selection.
- The [Shift] key allows you to add to the selection. Once you have an active selection, if you hold down the [Shift] key and then use a selection tool to select a portion of the image, the new selection will be added to the active selection.
- The [Ctrl] key allows you to subtract from an active selection. If you hold down the [Ctrl] key and then use a selection tool to select a portion of an active selection, that portion will be removed.

9.1.2 Loading a File

Before you can do any image manipulation, you need to somehow acquire an image. For example, you can scan an image, you can find one on the Internet (be careful about copyright restrictions!), or you can take a picture with a digital camera.

To load an existing file, click on **File => Open**. You will see the **Load Image** dialog, as shown in Figure 9–6, *The Load Image Dialog*.

Figure 9–6 The Load Image Dialog

The **Load Image** dialog displays your working directory — the directory you were in when you started GIMP. You can navigate up and down the filesystem tree by double-clicking on the **Directories** list on the left, then selecting a file to open from the **Files** list on the right.

Filename completion is supported by the GIMP. If you type the first letter (or more) of a filename into the **Selection** field and press the [Tab] key, the view will change to only those subdirectories and/or files beginning with that letter or letters.

The file you select will appear in the **Selection** field near the bottom of the dialog. A thumbnail preview will be displayed on the dialog; alternatively, you will see a **Generate Preview** button. If you want to see a thumbnail of the image, click on the **Generate Preview** button.

Once you have selected a file, click on the **OK** button to open it. You can also double-click on a filename to open it.

9.1.3 Saving a File

To save an image file, right click on the image and choose **File => Save** (or **Save as**). You will see the **Save Image** dialog if you choose **Save as** or if you choose **Save** but the file has not been saved before.

The **Save Image** dialog looks almost exactly like the **Load Image** dialog and navigation of the filesystem tree and choosing files works in the same way.

When you are saving an image, you will need to choose an image format. The **GIMP** supports a wide variety of image formats. In this chapter, we are going to talk about three of them: `.gif`, `.jpg`, and `.xcf`.

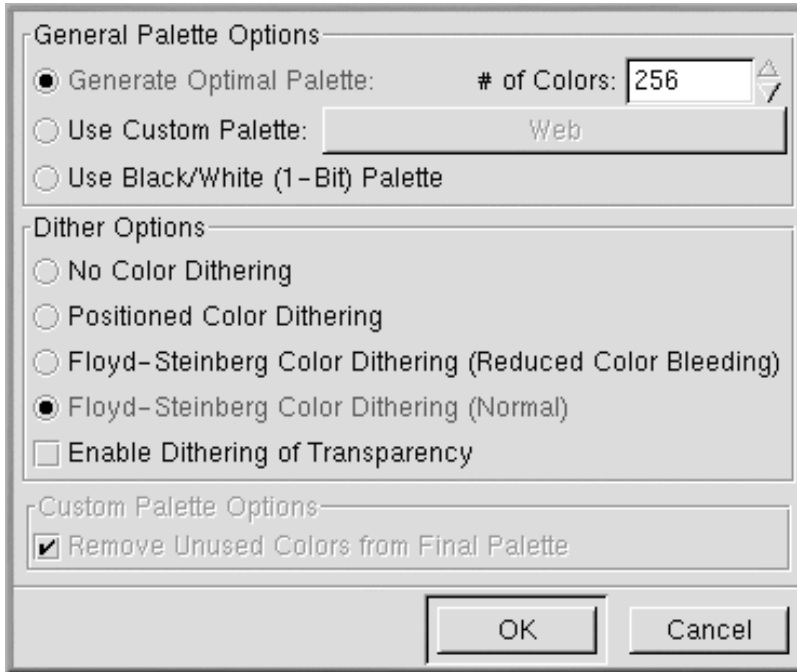
Image Formats

The vast majority of images on the Web are in one of two formats: `.gif` or `.jpg`. Both formats use compression to provide smaller file sizes and shorter download times (download speed is of paramount importance for everything on the Web). In most other ways, these two image formats are very different, and they are best used for different purposes.

The `.jpg` format is best used for photographs or images which use a lot of different colors.

The `.gif` format is best used for images which only use a few colors or which incorporate relatively large areas of the same color.

Before the **GIMP** will allow you to save an image as a `.gif`, you will need to convert to indexed color or to grayscale. Convert an image to indexed color by right-clicking on the image and then selecting **Image => Mode => Indexed**. The **Indexed Color Conversion** dialog will be displayed:

Figure 9–7 The Indexed Color Conversion Dialog

To minimize file size, a `.gif` image can only display a maximum of 256 colors. When you convert to indexed color, the RGB colors in the image are "standardized" to a particular palette of colors. If your image is going to be used on the Web, the safest palette choice is **Use Custom Palette: Web**. The palette optimized for the Web includes the group of 216 colors that are used by the majority of Web browsers.

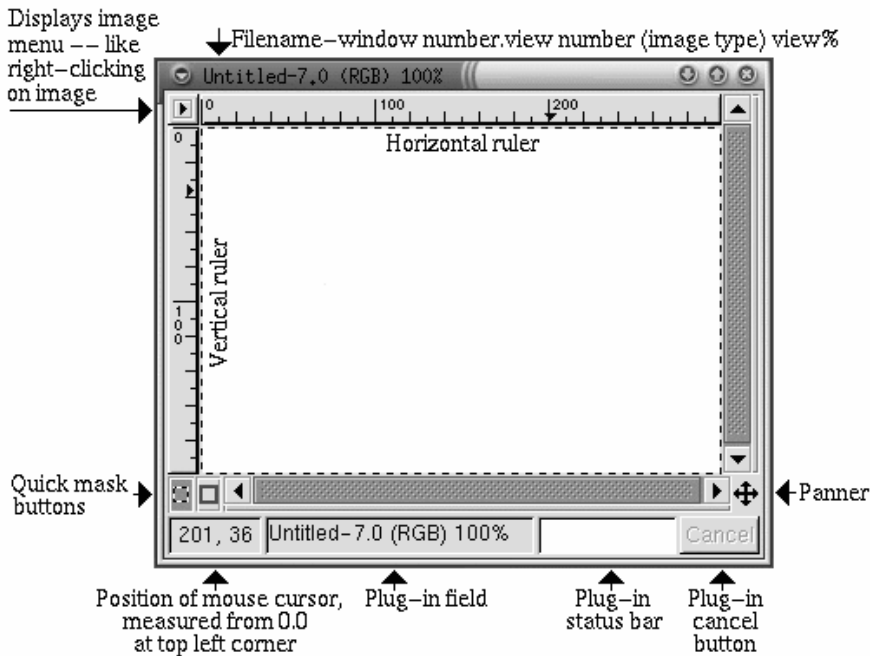
After you have converted your image to indexed format, the GIMP will allow you to save it as a `.gif` file. Alternatively, if you try to save an unconverted file as a `.gif` file, you will be prompted to export the image to indexed color or to grayscale.

If you are working on an image in the GIMP, and you want to save it in order to work on it later, you should save it as an `.xcf` file. The `.xcf` format is the GIMP's native file format. If you create an image in the GIMP, or if you open an image and add GIMP effects (such as layers or masks) to it, you have added information to the image file. This information will be lost if you save the image as a `.gif` or `.jpg`. If you save a file as an `.xcf` file, you will preserve that information. When you re-open the `.xcf` file, you will be able to edit the file as if you had never closed it.

9.1.4 The Image Window

When you load an image or open a new image, the GIMP surrounds the image with a frame which includes helpful information and tools, as shown in Figure 9–8, *The Image Window*.

Figure 9–8 The Image Window



At the top, the image window displays a file identifier consisting of:

- the name of the file (preceded by an * if the file has been modified),
- the window number (sequential from 0 for the first image opened when you start the GIMP),
- the view number (sequential from 0 for each image view),
- the image type: RGB, Indexed, or Grayscale,
- the amount of the image that can be seen in the window, depending on if you have zoomed in on the image.

At the top left, if you click on the  icon, the image menu will appear.

To help you visualize the size of your image, the GIMP provides horizontal and vertical rulers. You can toggle these off and on by right-clicking on the image and selecting **View => Toggle Rulers**.

At the bottom left, you will see the position of the mouse cursor on the image, measured from **0,0** at the top left corner.

Just above the mouse cursor position window, you will see two square icons, which are used for creating quick masks. Basically, masks are selections which can be saved and used again. We will not cover masks in this elementary chapter, but if you use the GIMP for complex images, you will find masks to be very helpful. Please see some of the sources listed in Section 9.3, *Additional Resources* for more information on masks.

Near the bottom right, you will see an icon that looks like the move tool icon. This is called the **panner**. If you are zoomed in on an image, you can click on the panner to display a thumbnail of the whole image. Then you can click and drag on the thumbnail to pan the image view in your image window.

Along the bottom of the window, next to the mouse cursor position window, you will see two status fields and then a **Cancel** button. The first status field displays the file name, unless a plug-in is running (for example, if you are applying a filter or a Script-Fu to an image). If a plug-in is running, the name of the plug-in will appear in the first status window. The next field is empty, but will display a status bar for a running plug-in. Finally, the **Cancel** button allows you to stop a running plug-in.

9.1.5 Helpful Keyboard Shortcuts

Like many other applications, the GIMP makes it easy to accomplish tasks without taking your hands off the keyboard. Here is a selection of helpful keyboard shortcut commands:

Table 9–1 Keyboard Shortcut Commands

Command	Keystroke	Command	Keystroke
copy	[Ctrl]-[c]	select all	[Ctrl]-[a]
cut	[Ctrl]-[x]	select none	[Ctrl]-[Shift]-[a]
invert selection	[Ctrl]-[i]	undo	[Ctrl]-[z]
paste	[Ctrl]-[v]	zoom in	[=]
save file	[Ctrl]-[s]	zoom out	[-]

9.2 Using the GIMP to Create Images for the Web

The easiest way to learn about anything is to try it yourself. In this section you will learn the steps needed to create some simple Web page graphics with the GIMP. The GIMP can do very complicated image manipulations as well; see the sources Section 9.3, *Additional Resources* for more detailed information.

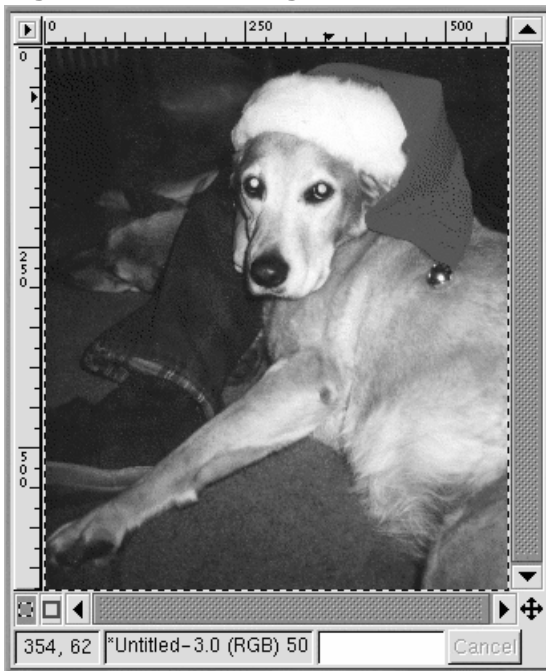
9.2.1 Enhancing a Picture

For this short example, we will take a single picture and:

- perform automatic color correction,
- correct a common problem in photographs — flash-reflecting eyes,
- remove some unwanted portions of the picture.

First, a scanned image is loaded into the GIMP, using **File => Open**:

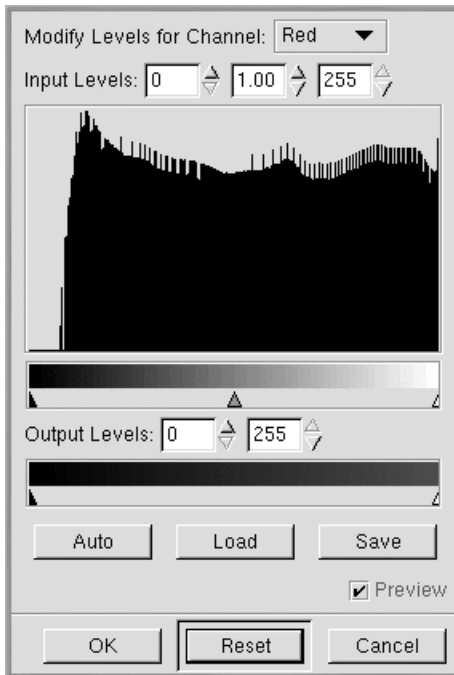
Figure 9–9 The Original Scanned Photograph, Including Flaws



As you can see, the original photograph of Bonnie the dog is not very good. The overall range of colors seems faded. Her eyes are reflecting the camera flash. Also, two distracting areas could be removed: the dark smudge at the top of her leg, and the small amount of a person's hand that can be seen by Bonnie's face.

First, the GIMP will be used to do some automatic color correction. Right-click on the image and select **Image => Colors => Levels** to display the **Levels** dialog. Since we are interested in color improvement, select **Red** from the **Modify Levels for Channel** pulldown menu, as seen in Figure 9–10, *The Levels Dialog*.

Figure 9–10 The Levels Dialog



The histogram displays the red values for all of the pixels in the image. The range of red values in the picture does not spread over the entire available tonal range (the lower bar, which shades from black to red). In other words, none of the pixels in the image have red values in the darkest range; as you can see, the histogram is flat in the very dark region of the range.

If you look at the **Blue**, **Green**, and **Value** (brightness) levels, their histograms look similar. Overall, the darkest colors in the image are not as dark as they could be, given the range of colors. The image

will look better if the range of values is compressed, so that the range of values in the image spreads over the entire range of values that are available.

This sounds complicated, but the **GIMP** makes it easy. Just click on the **Auto** button in the **Levels** dialog. **Auto** will automatically adjust all of the color ranges (red, blue, and green). If you would like to adjust the **Value** (brightness) of the image, you will need to select **Value** from the **Modify Levels for Channel** pulldown menu and click on the **Auto** button again.

If the **Preview** checkbox on the **Levels** dialog is checked, you will see a preview of the correction on the image. If you are happy with it, press **OK** on the **Levels** dialog to accept the changes.

Now, the Bonnie image looks like Figure 9–11, *Image After Automatic Color Levels Adjustment*.

Figure 9–11 Image After Automatic Color Levels Adjustment



Next, we will use the clone tool to remove distracting parts of the image. The clone tool grabs a portion of the image and allows you to paint with that portion. This allows you to replace unwanted artifacts in the image with a pattern found in the image.

First, use the [=] key to zoom in on the unwanted dark smudge on Bonnie's leg. Then select an appropriate brush. (To select a brush, click on the active brush in the Toolbox and select one from the **Brush Selection** dialog.) For this purpose, the **Circle (07) (7 x 7)** brush was chosen.

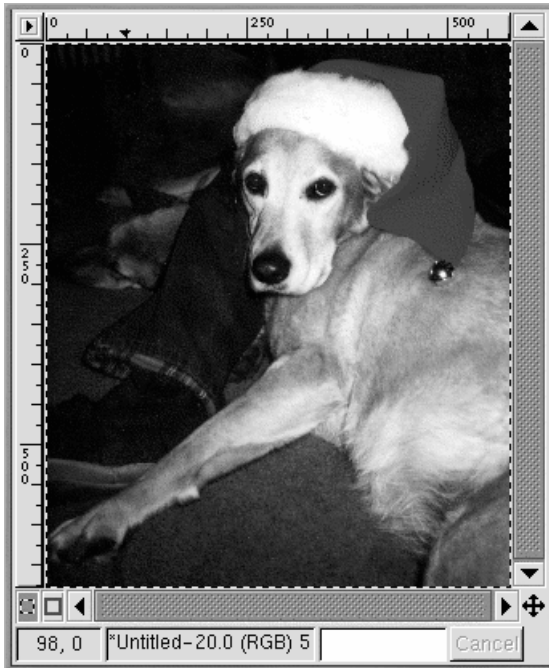
Select the clone tool from the Toolbox. With the [Ctrl] key pressed, click on an area to the left of the dark smudge, to select an area to apply as a pattern. Release the [Ctrl] key. Click and drag to paint over the unwanted portion of the image using the selected area as a pattern.

As you paint using the clone tool, you will see the cross hairs icon follow along at a distance with your paintbrush. The cross hairs icon marks the area which is providing the pattern for the paintbrush.

The same technique can be used to remove the small portion of a person's hand seen by Bonnie's face. Use the same brush and select an area from the blue jeans near the hand to clone.

The GIMP can be used to fix the eerie green reflection in her eyes. From the **Brush Selection** dialog, select the **Circle Fuzzy (11) x 11)** brush. Use the color picker tool to select a black color from the non-green edge of her eye. Then use the paintbrush tool to paint in the green area; the most difficult part is leaving a tiny spot of white in each eye, to make the eyes look a little more natural (not completely flat black).

After automatic color levels adjustment and removal of the smudge, the hand, and the green reflection, the image looks like Figure 9–12, *Image After Removal of Unwanted Portions*.

Figure 9–12 Image After Removal of Unwanted Portions

Finally, the edge of the image will be blurred, purely as a decorative effect.

Create a new image, larger than Bonnie's photograph, with a white background. Cut and paste the Bonnie image into the larger, white image. Use the rectangular select tool to select a rectangle just slightly smaller than Bonnie's image. Then right-click on the image, and choose **Select => Invert** to invert the selection, so a rectangular "frame" around the image, is selected, as in Figure 9–13, A *"Frame" Selection Around the Image*.

Figure 9–13 A "Frame" Selection Around the Image



To blur the edge, right-click and select **Filters => Blur => Gaussian Blur (IIR)**. With both of the **Blur Radius** settings at 10, click on the **OK** button to apply the filter.

Then the image is cropped to leave just a small white border, so it now looks like Figure 9–14, *The Final Image*.

Figure 9–14 The Final Image



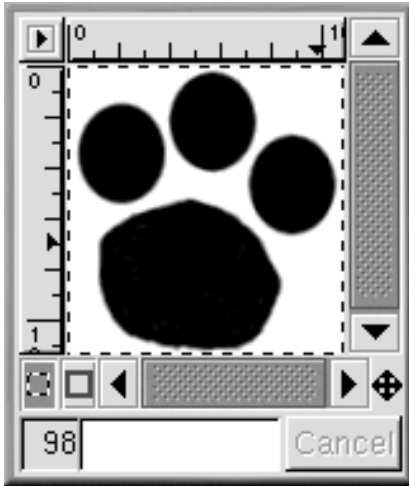
Finally, the image is saved as a . jpg file for use on our Web page.

9.2.2 Creating a Web Page Background Graphic

Since the Web page displays a picture of a dog, a stylized paw print will be used as the background.

The first step is to make a black and white paw print image. Open a new image window using **File => New**. In the **New Image** dialog that appears, set the **Width** and **Height** both to 500 pixels, to give you some room to work; you can always crop the image once you are finished. Set the **Fill Type** to **White** and click on the **OK** button.

When you are drawing something, it is easier to draw a large image, and then scale it down. To make this image, create an oval selection using the **Select elliptical regions** button, then use the bucket tool to fill in the selection with black. Copy the oval selection ([Ctrl]-[c]) and paste it ([Ctrl]-[v]) twice as you move the three ovals into an appropriate pattern. Then, use the paintbrush tool with a small brush to draw the pad a dog's foot. The original black and white image, sized 128 x 134 pixels, looks like Figure 9–15, *A Paw Print in Black and White*.

Figure 9–15 A Paw Print in Black and White

The paw print image is the basic building block for the next image — a series of tracks that "walk" across a page, as seen in Figure 9–16, *Tracks in Black and White*. To get from the one large paw print to the final image, follow these steps:

First, the paw print is scaled down. To scale the paw print, right-click on the image, then click **Image** => **Scale Image** to display the **Scale Image** dialog. The image was scaled by **Ratio** .85, because it was a little too large for the desired effect.

To angle the tracks, choose the transforms tool from the Toolbox and rotate the image freehand to about a 50-degree angle from horizontal.

Next, four copies of the paw print are copied and pasted into a new larger image. Use [Ctrl]-[c] to copy the image.

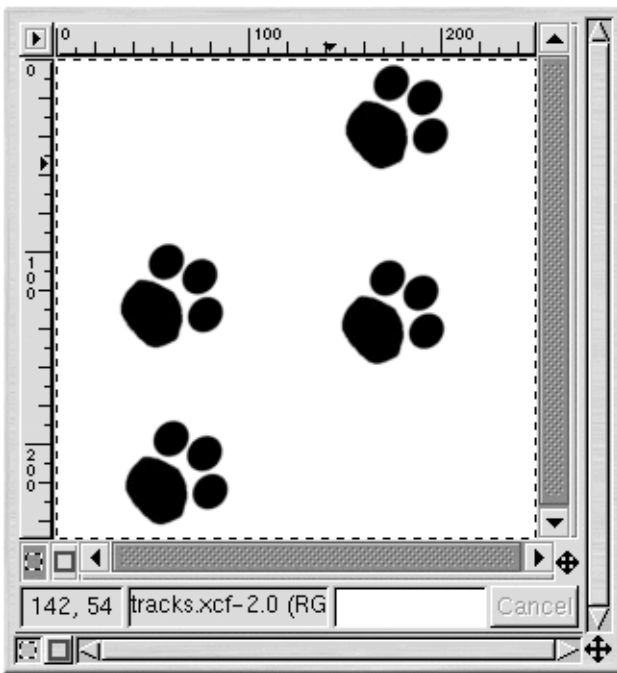
Paste the first paw print into the new image with [Ctrl]-[v]. Then move the paw print to where you want it. After it is placed correctly, paste another copy of the paw print into the larger image. The second paw print is now the active image, pasted directly over the first image. Move the second image off the first paw print into an appropriate spot. Repeat the same steps for the third and fourth paw prints. If you move something into the wrong spot, but you have already selected something else, you can always use [Ctrl]-[z] to back up and try again.

Next, a filter will be used to create a special effect. Filters provide a particular look or feel to an image. Right-click on the image and look at **Filters** to see a list of **GIMP** filters. For this image, we will first use the **Gaussian Blur (IIR)** filter and then the **Bump Map** filter.

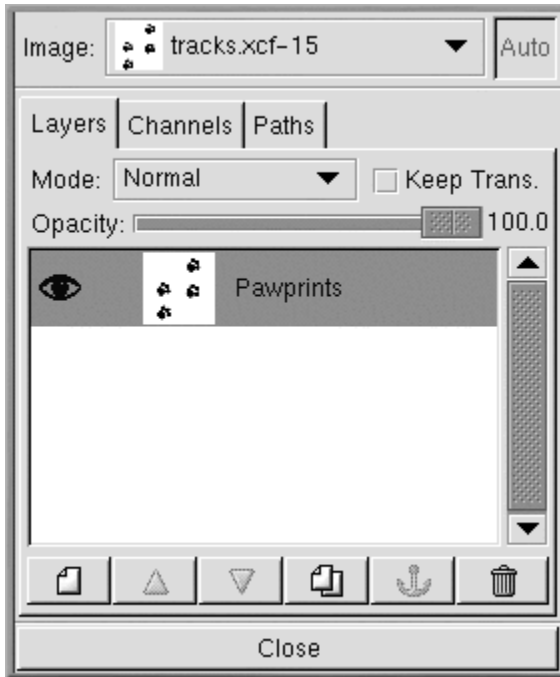
After the paw prints are placed in the right spots, blur the image with **Filters => Blur => Gaussian Blur (IIR)** set to both a **Horizontal** and **Vertical Blur Radius** of 5 (the default values). The image should be blurred because the next filter, **Bump Map**, acts on light and dark pixels, so its results will appear more natural with a bit of shading between the black and white of the original image.

The black and white tracks image, blurred slightly and scaled again to 50% so that it measures 250 x 250 pixels, looks like Figure 9–16, *Tracks in Black and White*.

Figure 9–16 Tracks in Black and White




Next the **Cork board** pattern is added to a new layer of the image. Use **Layers => Layers, Channels & Paths** to display the **Layers, Channels & Paths** dialog, as shown in Figure 9–17, *The Layers Dialog*.

Figure 9–17 The Layers Dialog

Layers keep portions of your working image separate from each other, so you can work on one piece of the image without affecting the other. Layers are essential for manipulating complex images.

The **Layers** dialog displays all of the layers in the image. As shown in Figure 9–17, *The Layers Dialog*, the image only includes one layer, which was re-named to **Pawprints** (right-click on the layer, then choose **Edit layer attributes** and fill in a descriptive name).

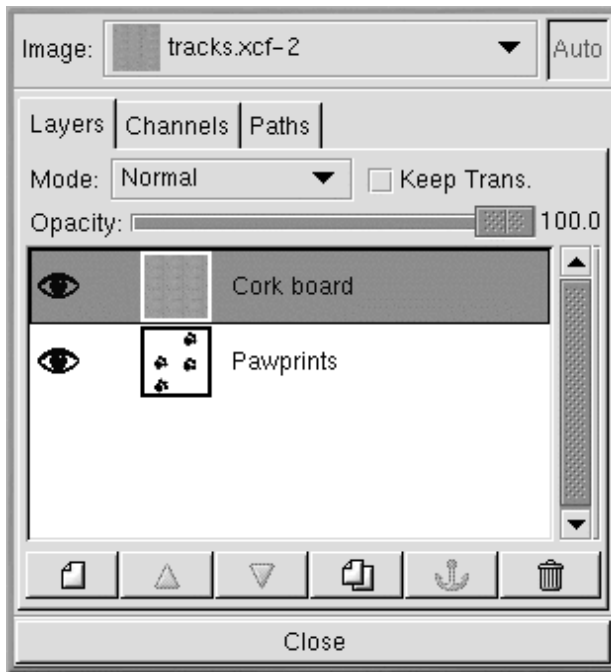
Next, a new layer is added for the pattern by clicking on the **New layer** icon . On the **New Layer Options** dialog that appears, leave the **Layer Width** and **Height** at the default values (the layer will be the same size as the image). Set the **Layer Fill Type** to **White** and click on the **OK** button.


New layers are automatically created on top of old layers, so you will not see the original layer in the image.

Next, the layer will be filled with the **Cork board** pattern. To fill a layer with a pattern, make sure that the layer is "active" (highlighted with a colored bar on the layers dialog — inactive layers will be

white). See Figure 9–18, *The New Layer in the Layers Dialog* for an example; the **Cork board** layer is active. Then, on the **Tool Options** for the bucket tool (double-click on the bucket tool to display the **Tool Options**), select **Pattern Fill**. Click on the active pattern on the Toolbox to see the patterns palette and select **Cork board**. Then use the bucket tool to fill the **Cork board** layer.

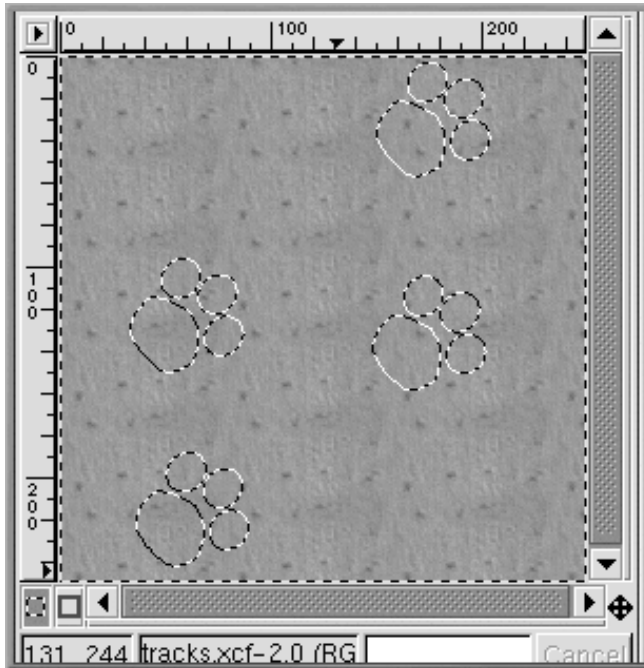
Figure 9–18 The New Layer in the Layers Dialog



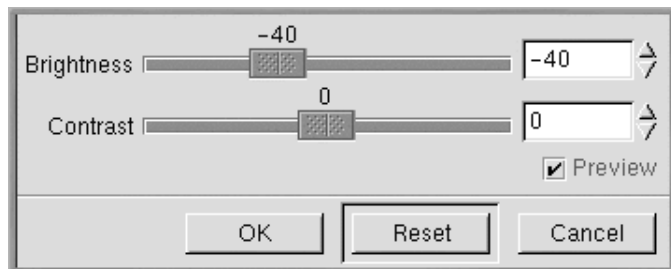
On the **Layers** dialog, make the paw prints layer the active layer by clicking on it. Then click on the eye icon () to make the cork board layer invisible. (Another click on the eye icon's spot will make the layer visible again.)

On the image, which should just show the paw prints image as seen in Figure 9–16, *Tracks in Black and White*, use the magic wand tool to select a white pixel. Then right-click on the image and go to **Select => Invert** to invert the selection, so only the black or gray pixels are selected.

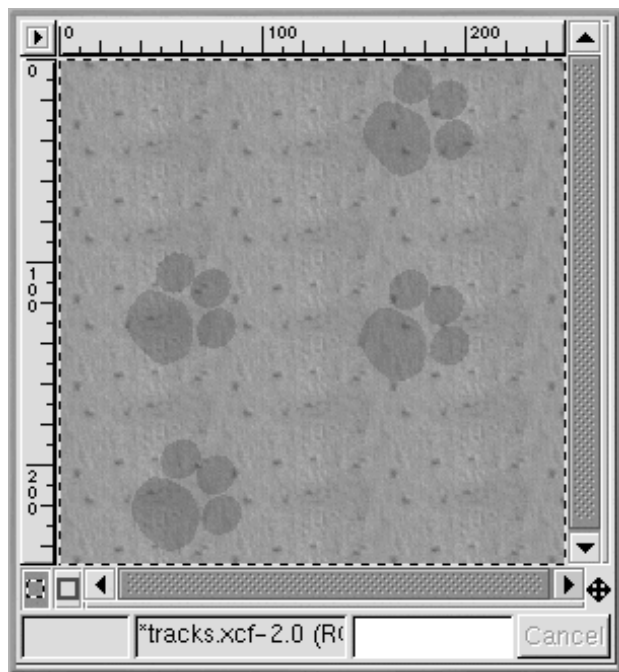
Now when you click on the eye icon on the layers dialog, to display the cork board layer, you will see the paw print selection, as seen in Figure 9–19, *The Pawprint Selection*.

Figure 9–19 The Pawprint Selection

The next step is to darken just the selected paw prints area. The paw prints need to be darkened so that the **Bump Map** filter will affect the paw prints, as well as the rest of the cork board pattern. The GIMP provides a number of different ways to darken the selected area. One simple way is to right-click on the image (with the selection still active), then select **Image => Colors => Brightness-Contrast**. On the **Brightness-Contrast** dialog, the **Brightness** slider is moved to **-40**, as shown in Figure 9–20, *The Brightness-Contrast Dialog*.

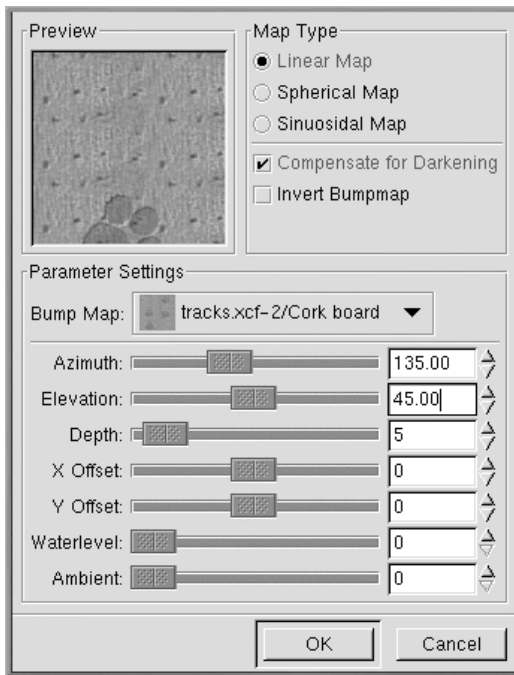
Figure 9–20 The Brightness-Contrast Dialog

Click on the **OK** button to darken the selected areas. Then right-click on the image, and choose **Select** => **None** (or use the keyboard shortcut [Shift]-[Ctrl]-[a]) to remove the selection, so you will see Figure 9–21, *The Paw-prints on the Cork Board Background*.

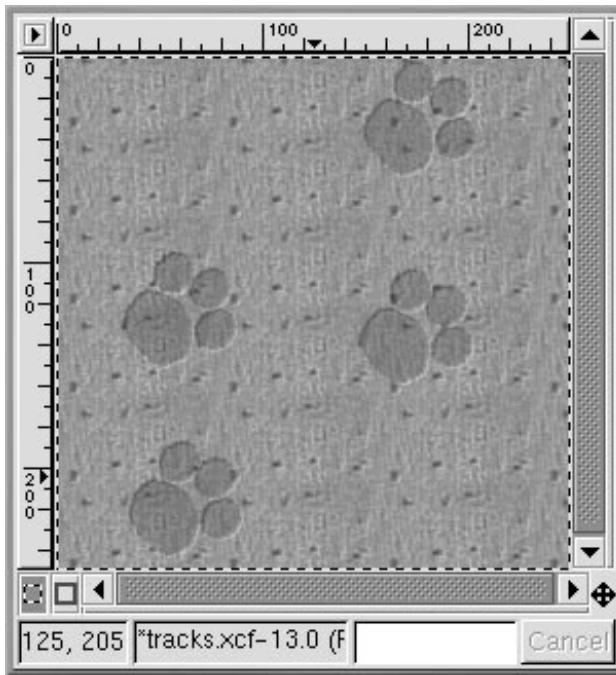
Figure 9–21 The Paw-prints on the Cork Board Background

To apply the filter, right-click on the image, then select **Filters => Map => Bump map** to display the **Bump Map** dialog:

Figure 9–22 The Bump Map Dialog



On the **Bump Map** dialog, the **Compensate for Darkening** checkbox is selected and the **Depth** (the perceived depth of the paw print) is set to 5. A preview of the image after the filter is applied is provided to show how the different **Bump Map** parameters can affect the appearance of an image. After selecting **OK**, the **Bump Map** filter is applied to the image as seen in Figure 9–23, *The Final Background Image*.

Figure 9–23 The Final Background Image

Background graphics for Web pages need to **tile**, meaning that any pattern on the graphic needs to match up on all sides so that when they are repeated on the page, the background appears to be seamless. In this case, since the cork board pattern is already tiled, there is no need to re-tile it. However, if you are working on a non-tiled graphic, the GIMP will tile a background for you using the **Filters => Map => Tile** filter.

9.2.3 Creating Title Images for Web Pages

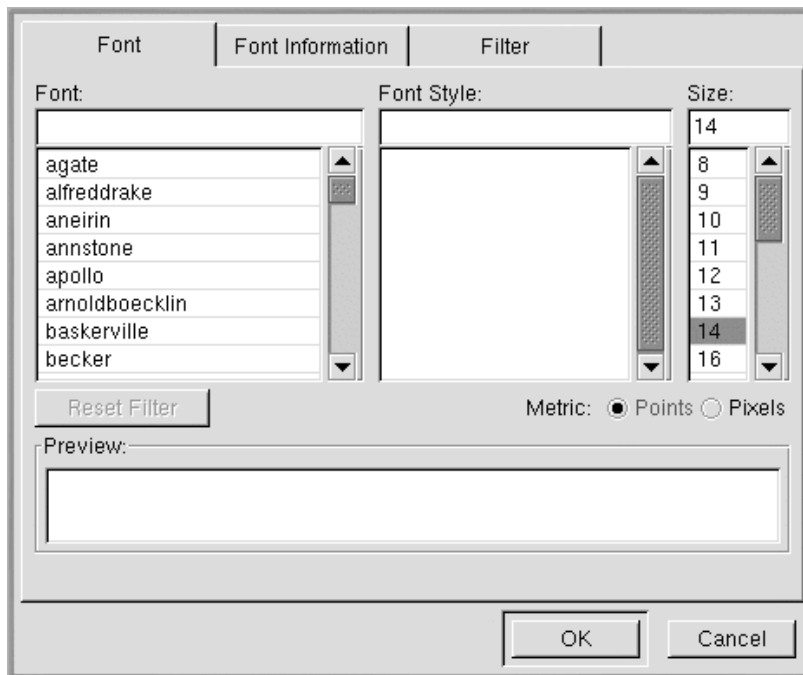
The GIMP is very helpful for creating logos (text for titles and links), buttons, and bullet graphics for Web pages.

In this example, we will use GIMP filters to add a custom look to some text for our Web page example.

The first step is to open a new file, sized 400 x 100 pixels, with a white background. Use **File => New**, add the correct **Width** and **Height** parameters, and select the **Fill Type Transparent** radio button.

Click on the text tool in the Toolbox to select it. Then click on the image, and the **Text Tool** dialog will appear as in Figure 9–24, *The Text Tool Dialog*.

Figure 9–24 The Text Tool Dialog

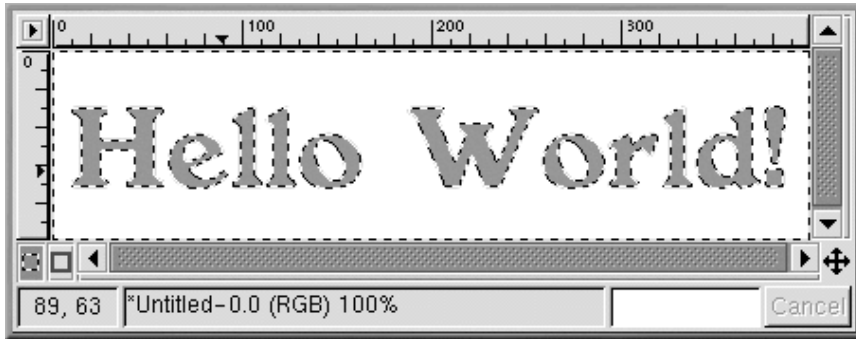


Type the text you want into the **Preview** field near the bottom of the dialog. Then select a **Font**, **Font Style**, and **Size** from the pulldown menus in the dialog. The text you have typed in will change to preview your selections, as shown in Figure 9–25, *Previewing Text*.

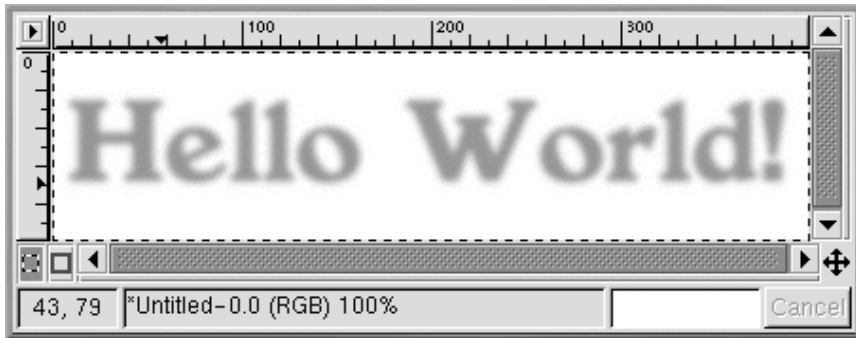
Figure 9–25 Previewing Text



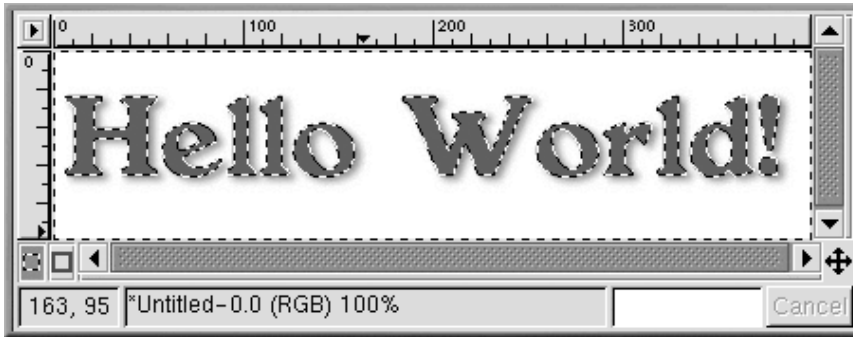
This text is actually going to be the drop shadow for the "real" text. Change the foreground color to a color for the drop shadow. For this example, a medium gray, with an RGB value of 153 153 153, is selected. Once you click on **OK** in the **Text Tool** dialog, the text will appear in the working window, as shown in Figure 9–26, *Text in an Image Window*.

Figure 9–26 Text in an Image Window

Click on the rectangle selection tool, then click on the image to place the text selection onto the image. To create a drop shadow, right-click on the image, and apply **Filters** => **Blur** => **Gaussian Blur (IIR)**. The **Gaussian Blur** dialog allows you to set the **Blur Radius**, which was left at the default of 5 pixels to produce the blurred effect in Figure 9–27, *Blurred Text*.

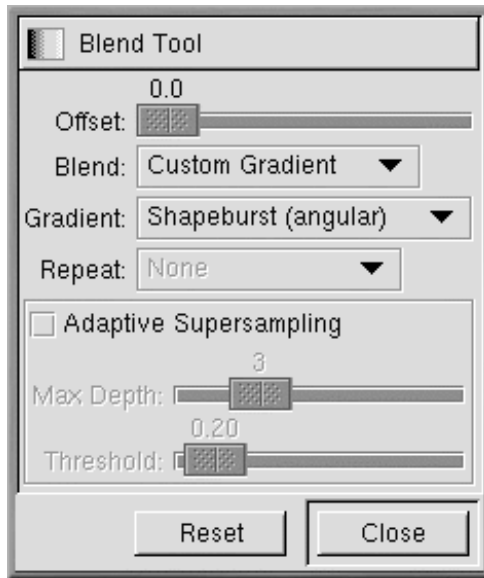
Figure 9–27 Blurred Text

Now the "real" text should be added to the image. First, the active foreground color needs to be changed. In this case, a faded red (RGB 204 051 051) is chosen. Then with the text tool active, click on the image. The **Text Tool** dialog will appear. Make sure the same settings are selected (they will be there by default, unless you closed the **GIMP**). Click on **OK** to add a red "Hello World!" to the image, and then move it into the right position, as shown in Figure 9–28, *Colored Text with a Drop Shadow*.

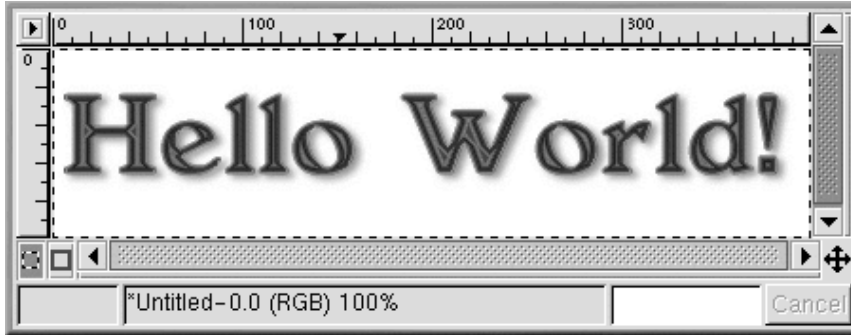
Figure 9–28 Colored Text with a Drop Shadow

Perhaps this still looks a little plain, and you would like something more interesting for your Web page. One option is to apply one of the GIMP's gradients to the text.

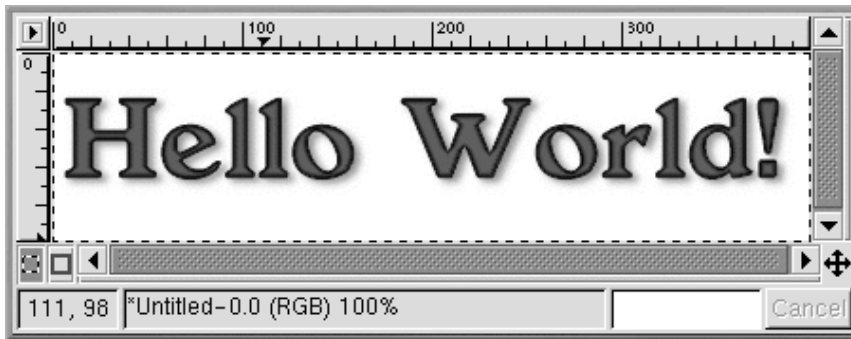
With the red "Hello World!" as the active selection, double-click on the gradient tool to make the gradient tool active and display its **Tool Options**. For this effect, **Custom Gradient** is selected as the **Blend** and **Shapeburst (angular)** is selected as the **Gradient**, as shown in Figure 9–29, *Gradient Options*.

Figure 9–29 Gradient Options

The next step is to choose which of the GIMP's many gradients to use. Click on the active gradient on the Toolbox to display the palette of available gradients. Click on a gradient to make it the active gradient. To apply a gradient to your text, make sure the text is still the active selection. Then click and drag on part of the text (since we chose **Shapeburst (angular)**, the length of the drag will not affect the appearance of the gradient, which will instead follow the edges of the selection). For example, if you apply these settings with the **Greens** gradient, the image looks like Figure 9–30, *Text in the Greens Gradient*.

Figure 9–30 Text in the Greens Gradient

Starting with the plain red "Hello World!" (just use [Ctrl]-[z] to go back) and the same gradient parameters, the **Tube_Red** gradient produces this effect, which will be used in the final Web page, as shown in Figure 9–31, *Text in the Tube_Red Gradient*.

Figure 9–31 Text in the Tube_Red Gradient

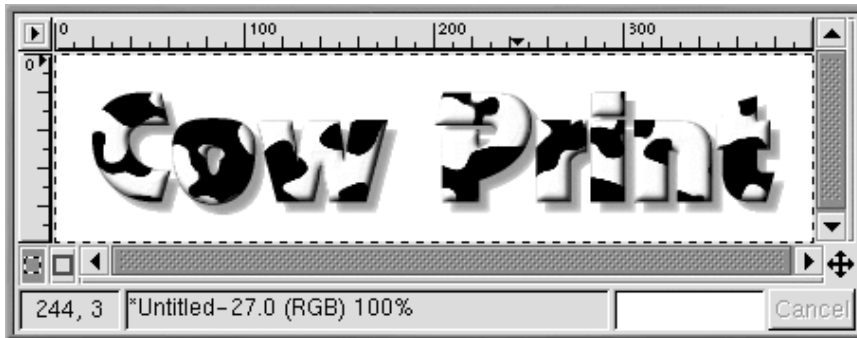
Script-Fu

As we have shown, you can use the tools and filters of the GIMP to create unique logos. You can also use the GIMP's Script-Fus to make graphics that may not be completely unique, but that are quickly created, easy, and very professional-looking.

Script-Fus provide a way for non-programmers to take advantage of GIMP's scripting abilities. Basically, they provide different GUIs for creating logos, patterns, brushes, and other special effects. You can also create your own Script-Fus. See Section 9.3, *Additional Resources* for sources of information about writing your own Script-Fus.

The easiest way to get an idea of what Script-Fus can do is to try one. From the Toolbox, click on **Xtns** => **Script-Fu** to see the menu of available Script-Fus. For example, if you chose **Xtns** => **Script-Fu** => **Logos** => **Bovination**, you will see the **Script-Fu: Logos/Bovination** dialog window. You can change the **Script Arguments**; in this case, we chose a font and changed the **Text**. Once you click on **OK**, you will see the GIMP apply a series of filters, and then a new image window will display the graphic created by Script-Fu: Figure 9–32, *Cow Print Text*.

Figure 9–32 Cow Print Text



A cow print logo may not be right for your Web page, but it does provide an excellent example of Script-Fu's ability to create special effects!

9.2.4 Combining the Graphics We Have Created on a Web Page

The background, title, and edited photograph can all be used on the same simple Web page: Figure 9–33, *Sample Web Page*.

Figure 9–33 Sample Web Page

9.3 Additional Resources

The GIMP can do so much more than what we have covered in this chapter! Please seek out some of the following resources if you are interested in learning more about the GIMP.

9.3.1 Useful Websites

Information about the GIMP is available on the Web:

<http://www.gimp.org/>

The official GIMP website

<http://www.rru.com/~meo/gimp/faq-user.html>

A Frequently Asked Questions (FAQ) list for questions commonly asked about the GIMP by GIMP users (as opposed to developers)

<http://manual.gimp.org/manual/>

The *GIMP User Manual* (by Karin Kylander and Olof S. Kylander) website, which includes the chapter "Mike Terry's Black Belt School of Script-Fu," an excellent resource for anyone who wants to learn how to write a Script-Fu

<http://empyrean.lib.ndsu.nodak.edu/~nem/gimp/tuts/>

The GIMP Tutorials Pointer Page

<http://gimp-savvy.com/>

The companion website to the book *Grokking the GIMP*, by Carey Bunks

<http://tigert.gimp.org/gimp/>

The GIMP website of tigert (Tuomas Kuosmanen), the artist who created Wilber (the GIMP mascot), as well as many other GIMP graphics

<http://brahms.fmi.uni-passau.de/~anderss/GIMP/>

The GIMP 1.0 Quick Reference Sheet — a tri-fold list of GIMP commands.

9.3.2 Related Books

Many books have been written about the GIMP. If you need in-depth information about the many capabilities of the GIMP, try your favorite bookstore. The following books were available at the time of this writing:

- *The Artists' Guide to the GIMP* by Michael J. Hammel; Frank Kasper and Associates, Inc.
 - *GIMP Essential Reference* by Alex Harford; New Riders Publishing
 - *GIMP for Linux Bible* by Stephanie Cottrell Bryant, et al; Hungry Minds, Inc.
 - *GIMP: The Official Handbook* by Karin Kylander and Olof S. Kylander (including "Mike Terry's Black Belt School of Script-Fu," an excellent how-to chapter on writing Script-Fus); The Coriolis Group
 - *Grokking the GIMP* by Carey Bunks; New Riders Publishing
 - *Sams Teach Yourself GIMP in 24 Hours* by Joshua and Ramona Pruitt; Sams
-

Part II Intermediate Tasks

10 Shell Prompt Basics

10.1 Why Use a Shell Prompt?

Graphical environments for Linux have come a long way in the past few years. You can be as productive as you'd like in the X Window System, without ever having to open a shell prompt.

However, it is worthwhile to learn how to work from a shell prompt, because using commands via the shell prompt can be quite fast. In the time it might take you to open the file manager in GNOME or KDE, locate a directory, and then create, delete, or modify files, you could have finished your work with several commands from a shell prompt.

In this section, we'll show you how to navigate, manipulate files, perform some basic administration tasks, and other shell prompt basics.

There's one component of your new operating system you can't do without: the shell. A shell prompt looks like an MS-DOS screen. Users type commands at a shell prompt, the shell interprets these commands, and then the shell tells the OS what to do. Many new users work primarily in a GUI rather than a shell while learning, but there are some tasks that simply cannot be performed in a GUI. Experienced users can write shell scripts to expand their capabilities even more. We've made numerous references to the shell, as in "shell prompt," or "bash." Now, it's time to learn a little more about this indispensable tool.

10.2 The History of the Shell

In the days when AT&T's Dennis Ritchie and Ken Thompson were designing UNIX™, they wanted to create a way for people to interact with their new system.

Operating systems at the time came with command interpreters, which could take commands from the user and interpret them so the machine could use them.

But Ritchie and Thompson wanted something more, something that offered better features than the command interpreters of the day. This led to the development of the Bourne shell (known simply as sh), created by S.R. Bourne. Since the creation of the Bourne shell, other shells have been developed, such as the C shell (csh) and the Korn shell (ksh).

When the Free Software Foundation sought a royalty-free shell, developers began to work on the language behind the Bourne shell as well as some of the popular features from other shells available at the time.

The result was the Bourne Again Shell, or bash.

By now, you may have seen the word `bash` when you've mistyped commands at the shell prompt (as in `bash: somecommand: command not found`).

More about bash

You can learn more about `bash` by reading the `bash` man page. At the shell prompt, type `man bash` (or you can save the file as a text file by typing `man bash | col -b > bash.txt`, which you can then open to read with an editor like `pico` or a pager like `less`). You can also print the file with `man bash | col -b | lpr`, but be warned: it's a large file. If you want more information, O'Reilly & Associates publishes *Learning the bash Shell*, by Cameron Newham and Bill Rosenblatt.

Although your system came with several different shells, `bash` is the default shell for Red Hat Linux.

10.3 Bash Environment Variables

The `bash` environment variables are commands that are simply expected to be there. As long as `bash` has the right pointers, it will fulfill your commands quickly. Take a look at the environment variables. At the shell prompt, type:

```
efunnv
```

A long list of `bash` environment variables appears. Each one helps customize the environment for you.

The `PATH` environment variable defines what is known as the default path. The `PATH` environment variable for our account `newuser` might look something like this:

```
PATH=/usr/local/bin:/usr/X11R6/bin:/usr/bin:/bin:/usr/X11R6/bin:/home/newuser/b
```

The `PATH` statement looks like a confusing jumble, but is actually a signpost which points to where programs can be found.

A PATH Standard

Remember the earlier reference to the Filesystem Hierarchy Standard (see Section 11.4, *A Larger Picture of the Filesystem*)? The `PATH` statement is set according to that standard, and programs are installed in directories in accordance with the FHS as well. The result is that the `PATH` statement will enable `bash` to automatically find nearly any program, assuming it has been installed in accordance with the FHS.

10.4 Creating a Boot Disk

When you're logged in as root, you might want to take a few minutes to create a fresh boot disk or copy the boot disk you already have.

There are a number of reasons you should make a boot disk. It can help you recover from a system failure, it can help you test a new kernel you've downloaded and compiled, and it can help you share your computer with more than one operating system.

You were given the opportunity to make a boot disk when you installed Red Hat Linux. If you chose not to make a boot disk at installation, here's your chance to start from scratch.

To create a boot disk:

Go to a shell prompt and make sure you're logged in as root. At the shell prompt, if you see something like `[newuser@localhost newuser]$`, for example, type:

```
[newuser@localhost newuser]$ su -  
Password: yourrootpassword  
[root@localhost newuser]#
```

Put a standard diskette in the floppy drive.

Naming The Floppy Drive

In Linux, the floppy drive is referred to as `/dev/fd0`.

If you have previously used the diskette, remember that you will lose everything on the diskette!

At the prompt, type:

```
uname -r
```

Your kernel version will be displayed. The kernel is the heart of any Linux system. Your kernel version will be something similar to:

```
2.4.x-yy
```

There will be several numbers after 2.4, for example: 2.4.1).

Now that you've found the kernel version, you can tell the `mkbootdisk` command which kernel to copy to your diskette.

Type the following command:

```
mkbootdisk --device /dev/fd0 2.4.x-yy
```

If you don't tell `mkbootdisk` where to copy the kernel, it will default to copying to the diskette in `/dev/fd0`.

Press [Enter]. When the light on your floppy drive goes off, remove and label the disk.

Clearing The Screen

If your screen becomes crowded, you can always start with a clean slate by typing `clear` at the prompt.

The `su` and `su -` Commands

The command `su` means substitute users, and it lets you temporarily log in as another user. When you type `su` all by itself and press [Enter], you become root (also called the superuser) while still inside your login shell. Typing `su -` makes you become root with root's login shell — that is, it's as if you had logged in as root. What's the difference? There are some commands which can be performed only if you've logged in as root; so typing `su -` allows you to perform these commands without logging out and logging back in.

10.5 Use Man Pages for Information

One of the easiest ways to find out how to use many commands and some applications is through the `man` command.

The word "man" stands for "manual," a series of online pages which can tell you the purpose of many commands. In a highly condensed format, man pages provide a summary of a command's purpose, the options available, and the syntax which is used to issue the command.

If you are new to Linux, you might not find man pages as useful as someone who is more accustomed to their terse delivery of information. But man pages can provide information on how to use commands on your system. Even at this point, you can gain insight into your system by familiarizing yourself with the man pages. You'll certainly want to know how to use them eventually.

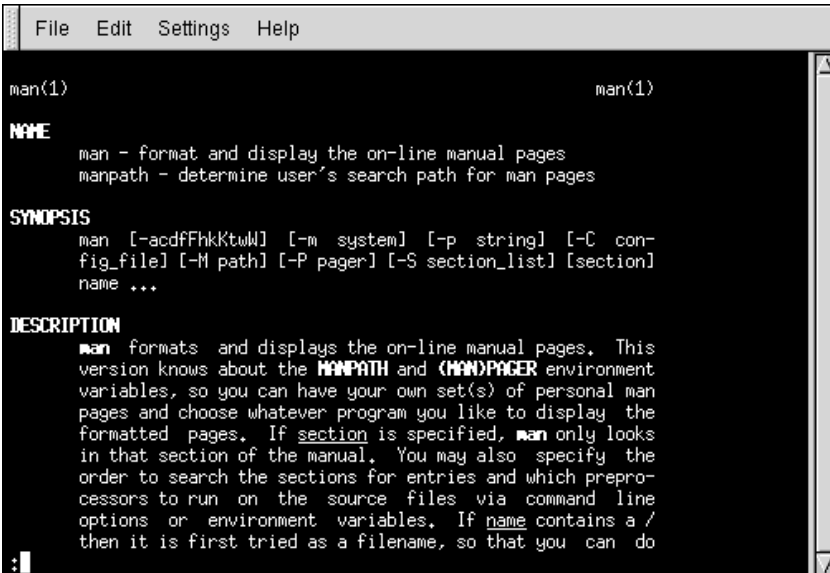
There are several ways to view the man pages in a graphical presentation:

- From the GNOME help browser (see Section 2.6, *Finding Help*)
 - From the KDE help browser (see Section 3.9, *Finding Help*)
 - From an application called `xman` at the shell prompt
-

You can quickly access a man page for a particular page by typing **man** followed by a space and any command at a shell prompt. For example, type **man su** and the man page for the **su** command appears.

To scroll forward through the document, press [Space]; to scroll back, press [b]. To quit the document, press [q].

Figure 10–1 Reading a Man Page at the Shell Prompt



```
File Edit Settings Help
man(1) man(1)
NAME
  man - format and display the on-line manual pages
  manpath - determine user's search path for man pages
SYNOPSIS
  man [-acdfFhkKtW] [-m system] [-p string] [-C con-
  fig_file] [-M path] [-P pager] [-S section_list] [section]
  name ...
DESCRIPTION
  man formats and displays the on-line manual pages. This
  version knows about the MANPATH and MANPAGER environment
  variables, so you can have your own set(s) of personal man
  pages and choose whatever program you like to display the
  formatted pages. If section is specified, man only looks
  in that section of the manual. You may also specify the
  order to search the sections for entries and which prepro-
  cessors to run on the source files via command line
  options or environment variables. If name contains a /
  then it is first tried as a filename, so that you can do
```

Of course, like any good help system, the man command has its own man page. At the prompt, type:

```
man man
```

to display the manual page (as shown in Figure 10–1, *Reading a Man Page at the Shell Prompt*).

For more advanced information on man pages, see the Official Red Hat Linux Reference Guide.

10.5.1 Printing a Man Page

Sometimes, just viewing the man page on the screen isn't enough; you may want to have a printed copy in front of you. Although you could send the page to a printer, because of certain text formatting in

the man pages, you could end up with a document filled with garbage, (symbols which didn't translate from your screen to the printer).

To print a man page, you need to remove the formatting from the page, which you can do with the `col` command. (As you might guess, there's a man page for `col`, also.)

For example, to print a man page for the man, type:

```
man man | col -b | lpr
```

In detail, the above command sends the output of the manual page entry through the `col` filter, which helps format the output for the printer. Then, the output from `col` is sent to the printer. This is called piping, and you can learn more about it in Section 10.13, *More Basic Commands for Reading Text Files*.

Use a User Account

Remember, it can be dangerous to work in the root account unless you really need to. If you didn't create your user account at the time of your Red Hat Linux installation and you haven't done so yet, please do so now. Turn to Section 1.2, *Creating a user account* if you need assistance on how to create your user account.

10.6 Determining Your Current Directory with `pwd`

Once you start looking through directories, it's easy to get lost, or forget the name of your current directory. `Bash`, the shell for your Linux system shows, by default, just your current directory, not the entire path.

Figure 10–2 The Command `pwd` Shows You Where You Are

A screenshot of a terminal window with a menu bar at the top containing 'File', 'Edit', 'Settings', and 'Help'. The terminal text shows a prompt '[newuser@localhost newuser]\$' followed by the command 'pwd'. The output is '/home/newuser'. The prompt is repeated on the next line: '[newuser@localhost newuser]\$' with a cursor.

To determine the exact location of your current directory within the filesystem, go to a shell prompt and type the following command:

```
pwd
```

You should see something like:

```
/home/newuser
```

This is telling you that you are in the `/newuser` directory, which is in your `/home` directory.

The command `pwd` stands for print working directory. When you typed `pwd`, you were asking your Linux system, "Where am I?" Your system responded by printing the directory you're in on the monitor, also known as the standard output.

You'll be using `pwd` often as you look around. Even Linux experts depend on this command.

10.7 Changing Directories with `cd`

Changing directories is easy as long as you know where you are (your current directory) and how that relates to where you want to go. Is the directory you want above or below your current directory?

To change directories, use the `cd` command. This command by itself will always return you to your home directory; moving to any other directory requires a pathname.

You can use absolute or relative pathnames. Absolute paths start at the top `/` (referred to as root) and then look down for the requested directory; relative paths look down from your current directory, wherever that may be. The tree below is used only as an example for the purpose of explaining `cd`.

```
/
directory1
directory2
directory3
```

If you are currently in `directory3` and you want to switch to `directory1`, you need to move up in the directory tree.

If you type:

```
cd directory1
```

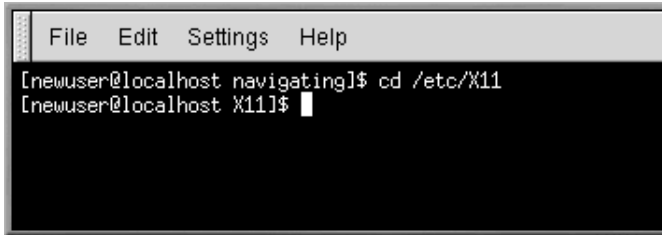
while you are in `directory3`, you will get an error message, telling you that there is no such directory. That's because there is no `directory1` below `directory3`.

To move up to `directory1`, you would type:

```
cd /directory1
```

This is an absolute path. It tells Linux to start at the top and look down until it finds `directory1`.

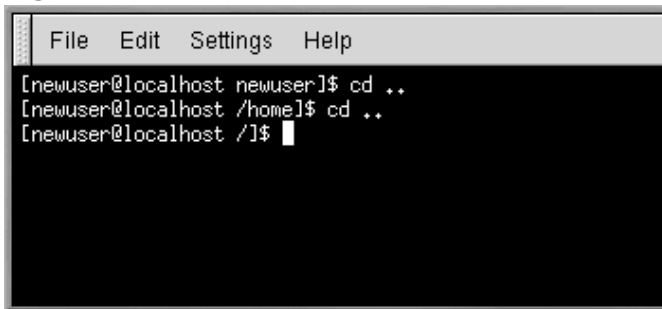
Just remember that absolute paths will take you TO any directory, FROM any directory and relative paths will only take you to directories below your current one.

Figure 10–3 Absolute Pathnames State the Full PathA terminal window with a menu bar (File, Edit, Settings, Help) and a black background. The text shows a user navigating from the root directory to a subdirectory using an absolute path.

```
[newuser@localhost navigating]$ cd /etc/X11
[newuser@localhost X11]$
```

Is the Path Absolute or Relative?

A path is absolute if the first character is a /; otherwise, it's a relative path.

Figure 10–4 Relative Pathnames are Relative to Current PositionA terminal window with a menu bar (File, Edit, Settings, Help) and a black background. The text shows a user navigating from their home directory to the root directory using relative paths.

```
[newuser@localhost newuser]$ cd ..
[newuser@localhost /home]$ cd ..
[newuser@localhost /]$
```

Here's an exercise involving absolute and relative paths. From your home directory, type the relative path:

```
cd ../../etc/X11
```

A `cd ..` tells your system to go up to the directory immediately above the one in which you are currently working. Obviously, `cd ../../` tells it to go up two directories.

After using the full command in the example, you should be in the directory `/X11`, which is where you'll find configuration files and directories related to the X Window System.

Take a look at your last `cd` command. You told your system to:

1. Go up one level to your login directory's parent directory (probably `/home`)
 2. Then go up to that directory's parent (which is the `/` directory)
-

3. Then go down to the `etc` directory
4. Finally, go to the `/X11` directory

Using an absolute path would get you to the `/X11` directory quickly. Type:

```
cd /etc/X11
```

and you're there.

Be Aware of Where You Are

Always make sure you know which working directory you're in before you state the relative path to the directory or file you want to get to. You don't have to worry about your position in the filesystem, though, when you state the absolute path to another directory or file. If you aren't sure, type `pwd`.

Table 10–1 `cd` Options

Command	Function
<code>cd</code>	returns you to your login directory
<code>cd ~</code>	also returns you to your login directory
<code>cd /</code>	takes you to the entire system's root directory
<code>cd /root</code>	takes you to the home directory of the root, or superuser, account created at installation
<code>cd /home</code>	takes you to the home directory, where user login directories are usually stored
<code>cd ..</code>	moves you up one directory
<code>cd ~otheruser</code>	takes you to <i>otheruser's</i> login directory, if <i>otheruser</i> has given you permission
<code>cd /dir1/subdirfoo</code>	regardless of which directory you're in, this absolute path would take you straight to subdirfoo , a subdirectory of dir1
<code>cd ../../dir3/X11</code>	this relative path would take you up two directories to root, then to <code>dir3</code> , then to the <code>X11</code> directory.

Now that you're starting to understand how to change directories, see what happens when you change to root's login directory (the superuser account). Type:

```
cd /root
```

You're not logged in as root, so you're "denied permission" to access that directory.

Denying access to the root and other users' accounts (or login directories) is one way your Linux system prevents accidental or malicious tampering. See Section 10.16, *Actions*

To change to the root login, use the `su` command. Type this series of commands:

```
[newuser@localhost newuser]$ su
Password: your root password
[root@localhost newuser]# cd /root
[root@localhost /root]#
```

As soon as you give the root password, you'll see the changes in your command prompt to show your new, superuser status: the root account designation at the front of the prompt and "#" at the end (as shown in Figure 10-5, *Becoming Root*).

Figure 10-5 Becoming Root



```
File Edit Settings Help
[newuser@localhost newuser]$ su
Password:
[root@localhost newuser]# cd /root
[root@localhost /root]#
```

Now when you `cd` to root's login directory, you'll be granted access.

When you're done working as root, just type `exit` at the prompt.

```
[root@localhost /root]# exit
exit
[newuser@localhost newuser]$
```

10.8 View Directory Contents with `ls`

Now that you know how to change directories, it's time to take a look at what's in these directories.

Type **ls** and press [Enter]. You should see the contents of your current directory — or most of it, at least.

The **ls** command, by itself, won't show you all the files in your directory. To see everything, you must include another option or two.

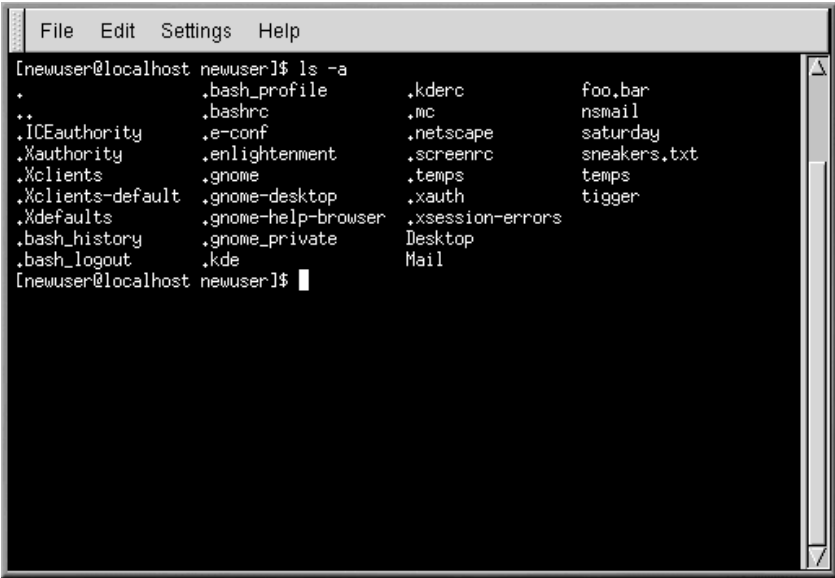
A multitude of options are available with the **ls** command.

Read the **ls** Man Page

If you want to see all the options of the **ls** command, you can read the man page by typing **man ls** at a shell prompt. If you want to print the man page, type **man ls | col -b | lpr** at the prompt.

Why are there so many options? Because they can help you sort information according to your needs. For example, you can specify how files are displayed, see their permissions and much more.

Figure 10–6 ls with -a Option



```
[newuser@localhost newuser]$ ls -a
.          .bash_profile  .kderc       foo,bar
..         .bashrc       .mc          nsmail
.ICEauthority .e-conf       .netscape   saturday
.Xauthority .enlightenment .screenrc    sneakers.txt
.Xclients   .gnome        .temps       temps
.Xclients-default .gnome-desktop .xauth       tigger
.Xdefaults .gnome-help-browser .xsession-errors
.bash_history .gnome_private Desktop
.bash_logout .kde          Mail
[newuser@localhost newuser]$
```

Type **ls -a**. Now you'll see files that begin with dots. These are called hidden files or, appropriately enough, dot files.

Hidden files are mostly configuration files which set preferences in programs, window managers, shells, and more. The reason they're hidden is to help prevent any accidental tampering by the user. Besides, when you're searching for something in a directory, you're not usually looking for these configuration files, so keeping them hidden helps to avoid some screen clutter.

Viewing all the files (**ls -a**) can give you plenty of detail, but you can view still more information, simply by adding more than one option.

If you want to see the size of a file or directory, when it was created and more, just add the "long" option (**-l**) to the **ls -a** command:

```
ls -al
```

This command shows the file creation date, its size, ownership, permissions, and more.

You don't have to be in the directory whose contents you want to view to use the **ls** command.

See what's in the `/etc` directory by typing:

```
ls -al /etc
```

You'll get plenty of information about the contents of the `/etc` directory.

Here's a short list of some popular options with **ls**. Remember, you can view the full list by reading the **ls** man page (**man ls**).

- **-a** — all. Lists all the files in the directory, including the hidden files (`.filename`). The `..` and `.` at the top of your list refer to the parent directory and the current directory, respectively.
- **-l** — long. Lists details about contents, including permissions (modes), owner, group, size, creation date, whether the file is a link to somewhere else on the system and where its link points.
- **-F** — file type. Adds a symbol to the end of each listing. These symbols include `/` to indicate a directory; `@` to indicate a symbolic link to another file; and `*` to indicate an executable file.
- **-r** — reverse. Lists the contents of the directory from back to front.
- **-R** — recursive. This recursive option lists the contents of all directories (below the current directory) recursively.
- **-s** — size. Sorts files by their size.

A little later in this chapter, when we introduce you to pipes and I/O redirection, you'll discover that there are other ways to view the contents of a directory.

10.9 Locating Files and Directories

There will be times when you know a file or directory exists but you won't know where to find it. Searching for a file or directory can be easier with the **locate** command.

With **locate**, you'll see every related file or directory that matches our search criterion. Let's say you want to search for all files related to the **finger** command (**finger** tells you who is using your computer).

```
locate finger
```

The **locate** command uses a database to check for files and directories that match the string **finger**.

More About Locate

To learn more about **locate**, read the **locate** man page (type **man locate** at a shell prompt).

The **locate** command that works very quickly, as long as the database is up to date. That database is automatically updated on a nightly basis, from **cron**. **Cron** is a small program that runs in the background, performing various tasks, such as updating the **locate** database, at regularly scheduled intervals.

More About Cron

cron is a **daemon** that executes tasks at regularly scheduled intervals. Daemons handle tasks in the background. To read the **cron** man page, type **man cron** at the shell prompt.

If you have more than one operating system on your machine and switch between them (causing Red Hat Linux to halt and restart), or if you shutdown your machine at the end of the day, **cron** rarely has a chance to update the **slocate** database, which is used to catalog file location.

To update the database manually, log in as root (type **su** at a shell prompt and then your root password), and then type **updatedb**.

```
updatedb
```

After a few minutes, the **slocate** database will be current.

Update Automatically with Anacron

You can run **anacron** to have your system execute commands periodically, with a frequency specified in days. Unlike **cron**, it does not assume that the machine is running continuously. Hence, it can be used on machines that aren't running 24 hours a day, to control daily, weekly, and monthly jobs that are usually controlled by cron.

Read the man or info page on **anacron** (type **man anacron** or **info anacron** at the command line) for more information.

10.10 Clear and Reset the Window

After even one **ls** command in a shell prompt, the screen can start to look crowded. You can always exit from the terminal window and open a new one, but here's a quicker way to clean up the screen.

Type the following command:

```
clear
```

at the shell prompt. The **clear** command does just what it implies: it clears the screen.

Sometimes, you may accidentally open a program file or some other non-text file in a terminal window. Once you close the file, you could find that the text you're typing doesn't match with the output on the monitor.

In such cases, you simply have to type:

```
reset
```

to return the window to its default values.

10.11 View, Redirect, and Append Files with cat

Red Hat Linux has a utility which can help you keep short lists, gather those lists together and, at the same time, show you a little of the power behind your system.

The utility is called **cat**, short for "concatenate," which means that it strings files together.

The command **cat** will also display the contents of an entire file on the screen (for example, type **cat filename.txt**). Using **cat** can be handy if the file is fairly short. But if a file is fairly long, it will quickly scroll past you on the screen, since **cat** displays the whole file.

But **cat** can also perform a quick demonstration of two important terms: standard input and standard output.

Standard input and standard output direct input and output (often referred to as I/O) to the user. If a program reads from standard input, it will by default be reading from the keyboard. If a program writes to standard output, by default it will be writing to the screen.

Start `cat` to see what this means. At the shell prompt, type:

```
cat
```

The cursor moves to a blank line. Now, in that blank line, type:

```
stop by sneaker store
```

and press the [Enter] key. Your screen will look like:

```
[newuser@localhost newuser]$ cat
stop by sneaker store
stop by sneaker store
```

Figure 10–7 `cat` Demonstrates Standard Input and Standard Output



To quit `cat`, move the cursor to a blank line by pressing [Enter]. Then press [Ctrl]-[D].

The `cat` command has just demonstrated the definition of standard input and standard output; you typed words (standard input) and they appeared on the screen (standard output).

10.11.1 Using Redirection

Redirection means causing the shell to change what it considers to be standard input or where the standard output is going.

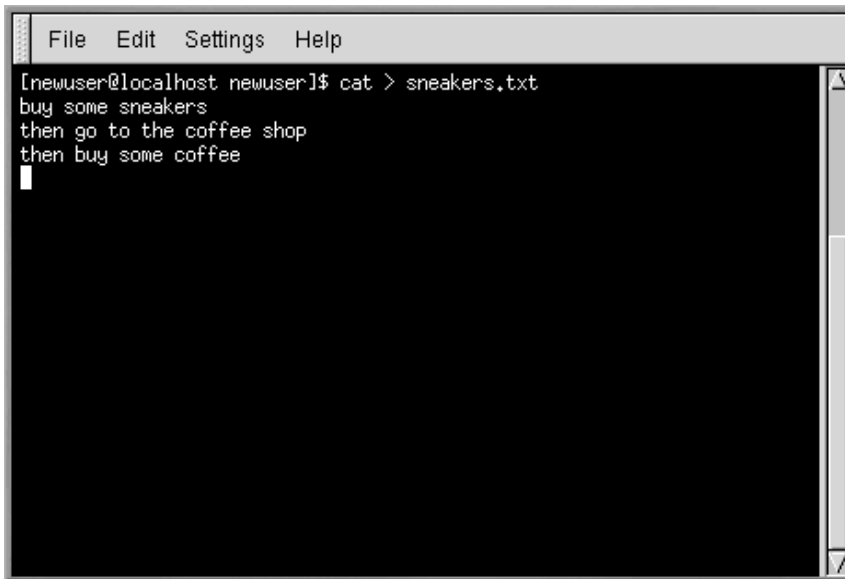
We used `cat` before to demonstrate the idea behind standard input and standard output. Now, let's use `cat` to see how standard output can be redirected.

To redirect standard output, we'll use the `>` symbol. Placing `>` after the `cat` command (or after any utility or application that writes to standard output) will direct its output to the filename following the symbol.

Let's try it. In a shell prompt type:

```
[newuser@localhost newuser]$ cat > sneakers.txt
buy some sneakers
then go to the coffee shop
then buy some coffee
```

Figure 10–8 Redirecting Output to a File



Now press `[Enter]` to go to an empty line, and use the `[Ctrl]-[D]` keys to quit `cat`.

Notice the difference (see Figure 10–8, *Redirecting Output to a File*)? For one thing, there are no double entries. That’s because the standard output from `cat` was redirected. That redirection was to a brand new file you made called `sneakers.txt`.

You can find the file in the directory you were in when you started `cat`(type `ls` if you want to see it listed).

You can even use `cat` to read the file, by typing:

```
cat sneakers.txt
```

at the prompt.



Be careful when you redirect the output to a file, because you can easily overwrite an existing file! Make sure the name of the file you’re creating doesn’t match the name of a pre-existing file, unless you want to replace it.

Let’s use output redirection for another file and call it `home.txt`. Type the following:

```
[newuser@localhost newuser]$ cat > home.txt  
bring the coffee home  
take off shoes  
put on sneakers  
make some coffee  
relax!
```

Now, on an empty line, use the [Ctrl]-[D] keys again to quit `cat`.

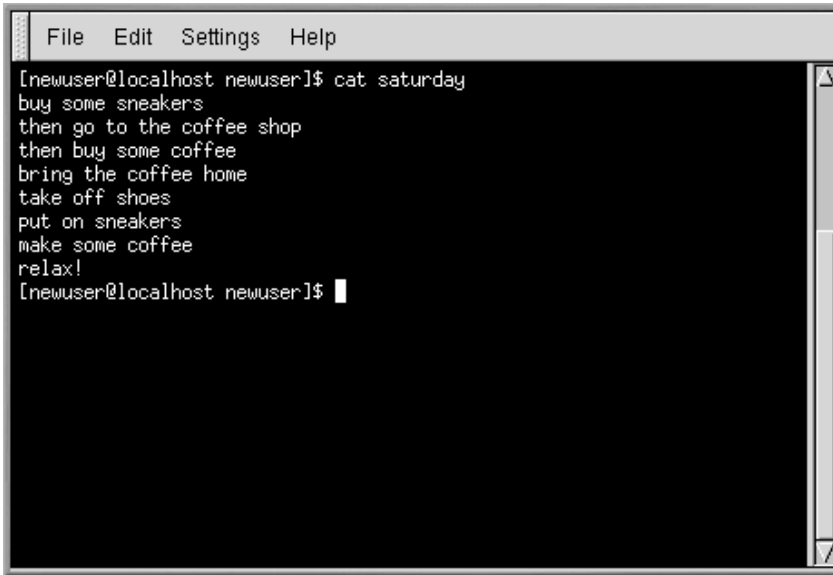
We can check the file again by typing:

```
cat home.txt
```

at the prompt.

Use `cat` again to join `home.txt` with `sneakers.txt` and redirect the output of both files to a brand new file called `saturday` (you’ll find an example in Figure 10–9, *Joining Files and Redirecting Output*). Type the following:

```
[newuser@localhost newuser]$ cat sneakers.txt home.txt > saturday
```

Figure 10–9 Joining Files and Redirecting OutputA screenshot of a terminal window with a menu bar at the top containing 'File', 'Edit', 'Settings', and 'Help'. The terminal text shows a shell prompt '[newuser@localhost newuser]\$' followed by the command 'cat saturday'. The output consists of eight lines of text: 'buy some sneakers', 'then go to the coffee shop', 'then buy some coffee', 'bring the coffee home', 'take off shoes', 'put on sneakers', 'make some coffee', and 'relax!'. The prompt '[newuser@localhost newuser]\$' appears again at the end of the output.

```
File Edit Settings Help
[newuser@localhost newuser]$ cat saturday
buy some sneakers
then go to the coffee shop
then buy some coffee
bring the coffee home
take off shoes
put on sneakers
make some coffee
relax!
[newuser@localhost newuser]$
```

Now it's time to check your work. Type:

```
[newuser@localhost newuser]$ cat saturday
```

and you should see something like this:

```
[newuser @localhost newuser]$ cat saturday
buy some sneakers
then go to the coffee shop
then buy some coffee
bring the coffee home
take off shoes
put on sneakers
make some coffee
relax!
[newuser @localhost newuser]$
```

You can see that `cat` has added `home.txt` where `sneakers.txt` left off.

Combining Files With cat

Creating and combining short files with `cat` can be a convenient alternative to using a text editor like Pico.

10.11.2 Appending Standard Output

You can use output redirection to add new information to the end of an existing file. Similar to when you used the `>` symbol, you tell your shell to send the information somewhere other than standard output.

However, when you use `>>`, you're *adding* information, rather than replacing it.

The best explanation is a demonstration, so take two files which have already been created — `sneakers.txt` and `home.txt` — and join them by using the append output symbol. You want to add the information in `home.txt` to the information already in `sneakers.txt`, so type:

```
cat home.txt >> sneakers.txt
```

Now check the file by typing:

```
cat sneakers.txt
```

And there it is, with the contents of `home.txt` at the end.

The command you typed told the system to "append the output from the file `home.txt` to the file `sneakers.txt`."

By appending the output, you save yourself a step or two (and a bit of disk clutter) by using existing files, rather than creating a new file.

Compare the results of the files `sneakers.txt` and `saturday` now, and you'll see that they're identical. To make your comparison, type:

```
cat sneakers.txt; cat saturday
```

The contents of both files will be displayed — first `sneakers.txt`, then `saturday` (as shown in Figure 10–10, *Stringing Commands and Comparing Files*).



Remember that when you append output, you've got to include two greater-than symbols (>>). Otherwise, you'll end up replacing the very file to which you want to append information!

Figure 10–10 Stringing Commands and Comparing Files

```
File Edit Settings Help
[newuser@localhost newuser]$ cat sneakers.txt; cat saturday
buy some sneakers
then go to the coffee shop
then buy some coffee
bring the coffee home
take off shoes
put on sneakers
make some coffee
relax!
buy some sneakers
then go to the coffee shop
then buy some coffee
bring the coffee home
take off shoes
put on sneakers
make some coffee
relax!
[newuser@localhost newuser]$
```

10.11.3 Redirecting Standard Input

Not only can you redirect standard output, you can perform the same type of redirection with standard input.

When you use the redirect standard input symbol <, you're telling the shell that you want a file to be read as input for a command.

Use a file you've already created to demonstrate this idea. Just type:

```
cat < sneakers.txt
```

Because you used the less-than symbol (<) to separate the **cat** command from the file, the output of `sneakers.txt` was read by `cat`.

10.12 Pipes

In Linux, pipes connect the standard output of one command to the standard input of another command.

Consider the **ls** command that was discussed earlier. There are plenty of options available with **ls**, but what if the contents of a directory stream by too quickly for you to view them?

View the contents of the `/etc` directory.

```
ls -al /etc
```

How do you get a closer look at the output before it moves off the screen?

One way is to pipe the output to a utility called **less**. Known as a **pager**, **less** allows you to view information one page (or screen) at a time.

Use the vertical bar (|) to pipe the commands (as shown in Figure 10–11, *Piping Output of ls to less*).

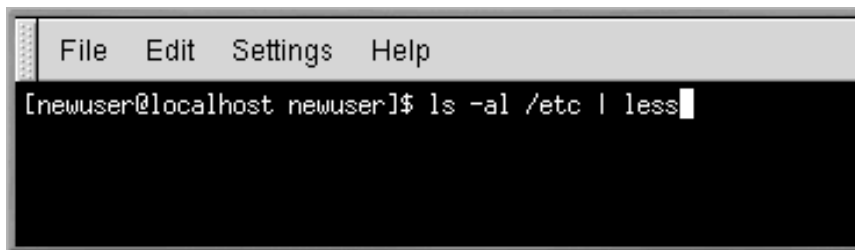
```
ls -al /etc | less
```

Now we can view the contents one screen at a time. To move forward a screen, press [Space]; to move back a screen, press [b]; to quit, press [q].

How to Read Your Startup Messages

To read startup messages more closely, at a shell prompt, type **dmesg | less**. You'll be able to read the file one screen at a time. To move forward, press the [Spacebar]; to quit, press [Q].

Figure 10–11 Piping Output of ls to less



Actually, pipes have already been introduced in this manual. In previous references to man pages, you used the following command to print them:

```
man ls | col -b | lpr
```

Here, the output of **man ls** is sent to a filter called **col** with an option of **-b** to help format the text for the printer. Then that output is sent to the printer using the **lpr** command.

For another example, type:

```
grep coffee sneakers.txt | lpr
```

This will print every line in the `sneakers.txt` file that mentions the word "coffee" (read more about **grep** in Section 10.13.3, *The grep Command*).

10.12.1 The more Command

The main difference between **more** and **less** is that **more** only lets you move forward through a file and **less** lets you move backwards and forwards.

Let's take a look at the man page for **more**, but this time, we'll open the page using **more** — by piping man's output to **more**.

```
man more | more
```

10.13 More Basic Commands for Reading Text Files

You've already been introduced to several basic shell prompt commands for reading files in text editors. Here are just a few more.

10.13.1 The head Command

You can use the **head** command if you just want to look at the beginning of a file. The command is:

```
head <filename>
```

Head can be a useful command, but because it's limited to the first several lines, you won't see how long the file actually is. By default, you can only read the first ten lines of a file, although you can change this number by specifying a number, as in the following command:

```
head -20 <filename>
```

10.13.2 The tail Command

The reverse of **head** is **tail**. Using **tail**, you can review the last ten lines of a file.

10.13.3 The `grep` Command

The `grep` command is useful for finding specific character strings in a file. For example, if you want to find every reference made to "coffee" in the file `sneakers.txt`, you would type:

```
grep coffee sneakers.txt
```

You would see every line in that file where the word "coffee" is found.

Remember Case

Unless otherwise specified, `grep` searches are **case sensitive**. That means that searching for *Coffee* is different than searching for *coffee*. So among `grep`'s options is `-i`, which allows you to make a case-insensitive search through a file. Read the `grep` man page for more about this command.

10.13.4 I/O Redirection and Pipes

You can use pipes and output redirection when you want to store and/or print information to read at a later time.

You can, for example, use `grep` to search for particular contents of a file, then have those results either saved as a file or sent to a printer.

To print the information about references to "coffee" in `sneakers.txt`, for example, just type:

```
grep coffee sneakers.txt | lpr
```

10.13.5 Wildcards and Regular Expressions

What if you forget the name of the file you're looking for? Using wildcards or regular expressions, you can perform actions on a file or files without knowing the complete filename. Just fill out what you know, then substitute the remainder with a wildcard.

More Information About Wildcards and Regular Expressions

To read more about wildcards and regular expressions, take a look at the `bash` man page (`man bash`). Remember that you can save the file to a text file by typing `man bash | col -b > bash.txt`. Then, you can open and read the file with `less` or `pico` (`pico bash.txt`). If you want to print the file, be aware that it is quite long.

We know the file's called "sneak____.txt," so just type:

```
ls sneak*.txt
```

and there's the name of the file:

```
sneakers.txt
```

You'll probably use the asterisk (*) most frequently when you're searching. The asterisk will search out everything that matches the pattern you're looking for. So even by typing:

```
ls *.txt
```

or:

```
ls sn*
```

You'd find `sneakers.txt` and any other files whose names begin with "sn." It helps to narrow your search as much as possible.

One way to narrow a search is to use the question mark symbol (?). Like the asterisk, using ? can help locate a file matching a search pattern.

In this case, though, ? is useful for matching a single character, so if you were searching for `sneaker?.txt`, you'd get `sneakers.txt` as a result, and/or `sneakerz.txt`, if there were such a filename.

When an asterisk, for example, just happens to be part of a filename, as might be the case if the file `sneakers.txt` was called `sneak*.txt`, that's when regular expressions can be useful.

Regular expressions are more complex than the straightforward asterisk or question mark.

Using the backslash (\), you can specify that you don't want to search out *everything* by using the asterisk, but you're instead looking for a file with an asterisk in the name.

If the file is called `sneak*.txt`, then, type:

```
sneak\*.txt
```

Here is a brief list of wildcards and regular expressions:

- * — Matches all characters
 - ? — Matches one character in a string (such as `sneaker?.txt`)
 - * — Matches the * character
 - \? — Matches the ? character
 - \) — Matches the) character
-

10.14 Command History and Tab Completion

It doesn't take long before the thought of typing the same command over and over becomes unappealing, at best. In Linux, since you can string together commands at the shell prompt, one minor typing error can ruin lines of a command.

One solution is to use the command line history. By scrolling with the up and down arrow keys, you can find plenty of your previously typed commands.

Try it by taking a look again at `sneakers.txt` (created in Section 10.11.1, *Using Redirection*). The first time, however, at the shell prompt, type:

```
cat sneakers.txt
```

Nothing happens, of course, because there is no `sneakers.txt` file. No problem. We'll just use the up-arrow key to bring back the command, then use the left-arrow key to get to the point where we missed the "e." Insert the letter and press [Enter] again.

We now see the contents of `sneakers.txt`.

By default, up to 500 commands can be stored in the `bash` command line history file.

The History Environment Variable

By typing the `env` command at a shell prompt, we can see the environment variable that controls the size of the command line history. The line which reads, `HISTFILESIZE=500` shows the number of commands that `bash` will store.

The command line history is actually kept in a file, called `.bash_history` in our login directory. We can read it in a number of ways: by using `pico`, `cat`, `less`, `more`, and others.

Be aware that the file can be long.

Let's read it with `more`:

```
more .bash_history
```

To move forward a screen, press [Space]; to move back a screen, press [b]; to quit, press [q].

Locating a Previously Used Command

Want to find a command in your history file without having to keep hitting the arrow keys or page through the history file? Use **grep**, a powerful search utility (see Section 10.13.3, *The grep Command*). Here's how you can quickly find a previously used command: Let's say you're searching for the command that was something like **cat sneak**-something. You've used the command and think it might be in your history file. At the shell prompt, then, type

```
history | grep sneak
```

Another time-saving tool is known as command completion. If you type part of a file, command, or pathname and then press the [Tab] key, **bash** will present you with either the remaining portion of the file/path, or a beep. If you get a beep, just press [Tab] again to obtain a list of the files/paths that match what's been typed so far.

For example, if you forget the command **updatedb**, but remember a portion of the command, you can **su** to root, then at the shell prompt, type **up**, press the [Tab] key twice and you'll see a list of possible completions, including **updatedb** and **uptime**. By adding the letter "d" to **up** and pressing [Tab] again, your command is completed for you.

10.15 Stringing Commands Together

Linux allows you to enter multiple commands at one time. The only requirement is that you separate the commands with a semicolon (you can see an example in Figure 10–10, *Stringing Commands and Comparing Files*).

Want to see how long you've been online using Netscape? Just combine the date command with Netscape's command.

```
date; netscape; date
```

Remember that commands are case sensitive, so the command to start Netscape must be in lowercase to start the browser.

You'll see something like this:

```
[newuser@localhost newuser]$ date; netscape; date
Mon Feb 7 13:26:27 EST 2000
```

A second date entry appears when you close out of Netscape. Then, the screen will look like this:

```
[newuser@localhost newuser]$ date; netscape; date
Mon Feb 7 13:26:27 EST 2000
```

```
Mon Feb 7 14:28:32 EST 2000
[newuser@localhost newuser]$
```

And the prompt will return. The discrepancy between the two results from the `date` command shows that you were using Netscape for just over an hour.

10.16 Ownership and Permissions

Earlier in this chapter, when you tried to `cd` to root's login directory, you received the following message:

```
[newuser@localhost newuser]$ cd /root
bash: /root: Permission denied
[newuser@localhost newuser]$
```

That was one demonstration of Linux's security features. Linux, like UNIX, is a multi-user system, and file permissions are one way the system protects against any type of damage.

One way to gain entry when you are denied permission is to `su` to root, as you learned earlier. That's because whoever knows the root password has complete access.

```
[newuser@localhost newuser]$ su
Password: your root password
[root@localhost newuser]# cd /root
[root@localhost /root]#
```

But switching to superuser isn't always convenient, or wise, since it's easy to make mistakes and alter important configuration files.

All files and directories are "owned" by the person who created them. You created the file `sneakers.txt` (see Section 10.11.1, *Using Redirection* in your login directory, so `sneakers.txt` "belongs" to you.

That means you can specify who's allowed to read the file, write to the file or, if it's an application instead of a text file, who can execute the file.

Reading, writing, and executing are the three main settings in permissions.

Since users are placed into a group when their accounts are created, then you can also specify whether certain groups can read, write to, or execute a file.

Take a closer look at `sneakers.txt` with the `ls` command using the `-l` (long) option (see Figure 10-12, *Permissions for sneakers.txt*).

```
[newuser@localhost newuser]$ ls -l sneakers.txt
-rw-rw-r-- 1 newuser newuser 150 Mar 19 08:08 sneakers.txt
```

There's a lot of detail provided here. You can see who can read (r) and write to (w) the file, as well as who created the file (newuser) and to which group the owner belongs (newuser).

Your default group

Remember that, by default, your group is the same as your login name.

Figure 10–12 Permissions for sneakers.txt

```

File Edit Settings Help
[newuser@localhost newuser]$ ls -l
total 28
drwxr-xr-x  5 newuser newuser  4096 Dec  8 05:43 Desktop
drwx----- 2 newuser newuser  4096 Dec 14 08:48 Mail
-rw-rw-r--  1 newuser newuser    0 Feb  6 07:18 foo,bar
drwx----- 2 newuser newuser  4096 Dec 14 08:50 nsmail
-rw-rw-r--  1 newuser newuser  143 Feb  6 06:43 saturday
-rw-r--r--  1 newuser newuser  143 Feb  6 06:45 sneakers.txt
drwxrwxr-x  5 newuser newuser  4096 Feb  6 06:30 temps
drwxrwxr-x  2 newuser newuser  4096 Feb  6 07:19 tigger
[newuser@localhost newuser]$

```

Other information to the right of the group includes file size, date and time of file creation, and file name.

```
-rw-rw-r--
```

The first column (shown above) shows current permissions; it has ten slots. The first slot represents the type of file. The remaining nine slots are actually three sets of permissions for three different categories of users.

Those three sets are: the owner of the file, the group in which the file belongs, and "others," meaning users and groups other than the owner of the file (newuser), and those in newuser's group (which is also newuser).

```

-      (rw-)  (rw-)  (r--)   1 newuser newuser
|      |     |     |     |
|      |     |     |     |

```

```
type owner group others
```

The first item, which specifies the file type, can show one of the following:

- `d` — a directory
- `-`(dash) — a regular file (rather than directory or link)
- `l` — a symbolic link to another program or file elsewhere on the system

Beyond the first item, in the following three sets, you'll see one of the following:

- `r` — file can be read
- `w` — file can be written to
- `x` — file can be executed (if it's a program)

When you see a dash in owner, group, or others, it means that particular permission has not been granted.

Look again at first column of `sneakers.txt` and identify its permissions. (See Figure 10–13, *A Closer View of Permissions*)

```
[newuser@localhost newuser]$ ls -l sneakers.txt
-rw-rw-r-- 1 newuser newuser 150 Mar 19 08:08 sneakers.txt
[newuser@localhost newuser]$
```

Figure 10–13 A Closer View of Permissions



The file's owner (in this case, `newuser`) has permission to read and write to the file. It is not a program, so `newuser` doesn't have permission to execute it. The group, `newuser`, has permission to read and write to `sneakers.txt`, as well. Similar to the program notation for owner `newuser`, there's no execute permission for group `newuser`.

In the last set, you can see that those who aren't either the user `newuser` or in the group called `newuser` can read the file, but can't write to it or execute it.

Change the permissions on `sneakers.txt` with the `chmod` command.

The original file looks like this, with its initial permissions settings:

```
-rw-rw-r-- 1 newuser newuser 150 Mar 19 08:08 sneakers.txt
```

If you are the owner of the file or are logged into the root account you can change any permissions for the owner, group, and others.

Right now, the owner and group can read and write to the file. Anyone outside of the group can only read the file (`r--`).



Remember that file permissions are a security feature. Whenever you allow everyone to read, write to, and execute files, you are increasing the risk of files being tampered with, altered, or deleted. As a rule, then, you should only grant read and write permissions to those who truly need them.

In the following example, you want to allow everyone to write to the file, so they can read it, write notes in it, and save it. That means you'll have to change the "others" section of the file permissions.

Since you're the owner of the file, you don't have to **su** to root to do it. Take a look at the file first. At the shell prompt, type:

```
ls -l sneakers.txt
```

The previous command displays this file information:

```
-rw-rw-r--  1 newuser newuser  150 Mar 19 08:08 sneakers.txt
```

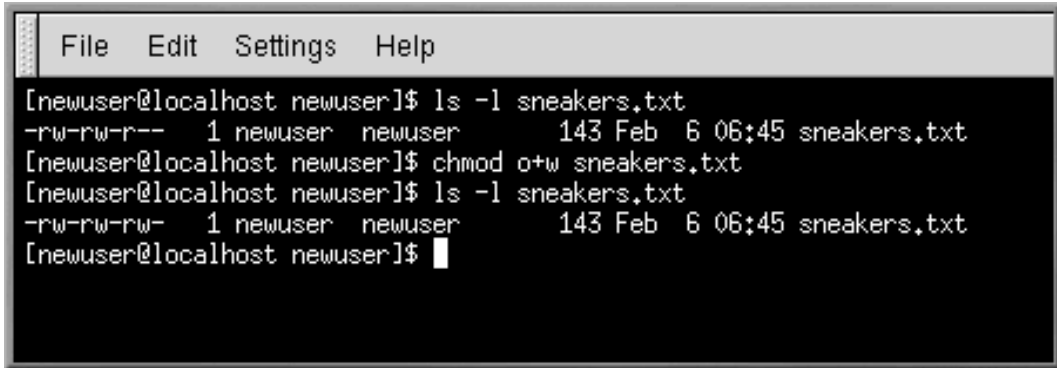
Now, type the following:

```
chmod o+w sneakers.txt
```

To check the results, list the file's details again. Now, the file looks like this:

```
-rw-rw-rw-  1 newuser newuser  150 Mar 19 08:08 sneakers.txt
```

Now, everyone can read and write to the file (Figure 10–14, *Changing Permissions for sneakers.txt*).

Figure 10–14 Changing Permissions for sneakers.txt

```
File Edit Settings Help
[newuser@localhost newuser]$ ls -l sneakers.txt
-rw-rw-r-- 1 newuser newuser 143 Feb 6 06:45 sneakers.txt
[newuser@localhost newuser]$ chmod o+w sneakers.txt
[newuser@localhost newuser]$ ls -l sneakers.txt
-rw-rw-rw- 1 newuser newuser 143 Feb 6 06:45 sneakers.txt
[newuser@localhost newuser]$
```

The **o+w** command tells the system you want to give others write permission to the file `sneakers.txt`.

To remove read and write permissions from `sneakers.txt` use the **chmod** command to take away both the read and write permissions like so:

```
chmod go-rw sneakers.txt
```

and the result will look like this:

```
-rw----- 1 newuser newuser 150 Mar 19 08:08 sneakers.txt
```

By typing **go-rw**, you are telling the system to remove read and write permissions for the group and for others from the file `sneakers.txt`.

You might think of these settings as a kind of shorthand when you want to change permissions with **chmod**, because all you really have to do is remember a few symbols and letters with the **chmod** command.

Here a list of what the shorthand represents:

10.16 Identities

u — the user who owns the file (that is, the owner)

g — the group to which the user belongs

o — others (not the owner or the owner's group)

a — everyone or all (**u**, **g**, and **o**)

10.16 Permissions

- r** — read access
- w** — write access
- x** — execute access

10.16 Actions

- +** — adds the permission
- — removes the permission
- =** — makes it the only permission

An Additional Permission

Another permission symbol is **t**, for the sticky bit. If a sticky bit is assigned to a file, a user who wants to remove or rename that file must own the file, own the directory, have write permission, or be root (see *File Properties* in Section 11.1.1).

Want to test your permissions skills? Remove all permissions from `sneakers.txt` — for everyone.

```
chmod a-rwx sneakers.txt
```

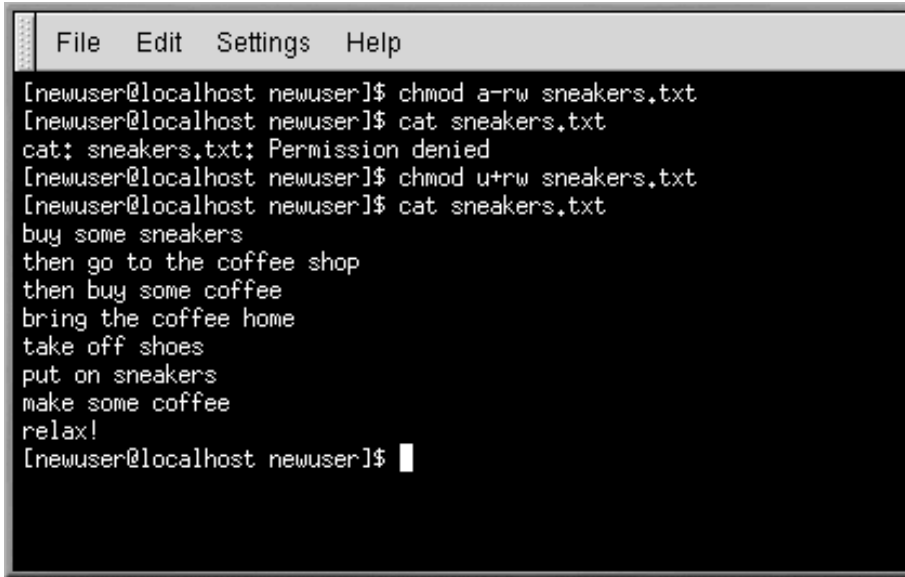
Now, see if you can read the file:

```
[newuser@localhost newuser]$ cat sneakers.txt
cat: sneakers.txt: Permission denied
[newuser@localhost newuser]$
```

It worked. But since the file belongs to you, you can always change its permissions back (see Figure 10–15, *Removing and Restoring Permissions*).

```
[newuser@localhost newuser]$ chmod u+rw sneakers.txt
[newuser@localhost newuser]$ cat sneakers.txt
buy some sneakers
then go to the coffee shop
then buy some coffee
bring the coffee home
take off shoes
put on sneakers
make some coffee
relax!
```

```
[newuser@localhost newuser]$
```

Figure 10–15 Removing and Restoring Permissions

```
File Edit Settings Help
[newuser@localhost newuser]$ chmod a-rw sneakers.txt
[newuser@localhost newuser]$ cat sneakers.txt
cat: sneakers.txt: Permission denied
[newuser@localhost newuser]$ chmod u+rw sneakers.txt
[newuser@localhost newuser]$ cat sneakers.txt
buy some sneakers
then go to the coffee shop
then buy some coffee
bring the coffee home
take off shoes
put on sneakers
make some coffee
relax!
[newuser@localhost newuser]$
```

Here are some common examples of settings that can be used with **chmod**:

- **g+w** — adds write access for the group
- **o-rwx** — removes all permissions for others
- **u+x** — allows the file owner to execute the file
- **a+rw** — allows everyone to read and write to the file
- **ug+r** — allows the owner and group to read the file
- **g-rx** — lets the group only read and execute (not write)

By adding the **-R** option, you can change permissions for entire directory trees.

Because you can't really "execute" a directory as you would an application, when you add or remove execute permission for a directory, you're really allowing (or denying) permission to search through that directory.

To allow everyone read and write access to every file in the `tigger` directory in your login directory, type:

```
chmod -R a+rw tigger
```

But... if you don't allow others to have execute permission to `tigger`, it doesn't matter who has read or write access, because no one will be able to get into the directory — unless they know the exact filename they want.

For example, type:

```
chmod a-x tigger
```

to remove everyone's execute permissions.

Here's what happens now when you try to `cd` to into `tigger`:

```
[newuser@localhost newuser]$ cd tigger
bash: tigger: Permission denied
[newuser@localhost newuser]$
```

Restore your own and your group's access.

```
chmod ug+x tigger
```

Now, if you check your work with `ls -dl` you'll see that only others will be denied access to the `tigger` directory.

10.17 Changing Permissions With Numbers

Remember the reference to the shorthand method of `chmod`? Here's another way to change permissions; it may seem a little complex at first.

Go back to the original permissions for `sneakers.txt` (type `ls -l sneakers.txt`).

```
-rw-rw-r-- 1 newuser newuser 150 Mar 19 08:08 sneakers.txt
```

Each permission setting can be represented by a numerical value:

- `r = 4`
- `w = 2`
- `x = 1`
- `- = 0`

When these values are added together, the total is used to set specific permissions.

For `sneakers.txt`, here are the numerical permissions settings:

```

-  (rw-)  (rw-)  (r--)
   |      |      |
  4+2+0  4+2+0  4+0+0

```

The total for the user is six, the total for the group is six and the total for others is four. The permissions setting, then, is read as 664.

If you want to change `sneakers.txt` so those in your group won't have write access, but can still read the file (as shown in Figure 10–16, *Removing Group Write Permissions*), remove the access by subtracting 2 from that set of numbers.

The numerical values, then, would become six, four, and four — or 644.

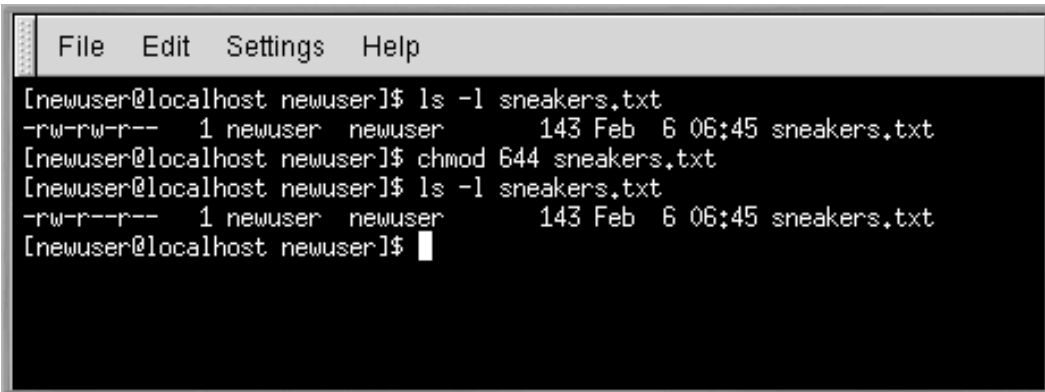
So type:

```
chmod 644 sneakers.txt
```

Check the changes by listing the file (`ls -l sneakers.txt`):

```
-rw-r--r--  1 newuser newuser  150 Mar 19 08:08 sneakers.txt
```

Figure 10–16 Removing Group Write Permissions



```
File Edit Settings Help
[newuser@localhost newuser]$ ls -l sneakers.txt
-rw-rw-r--  1 newuser newuser  143 Feb  6 06:45 sneakers.txt
[newuser@localhost newuser]$ chmod 644 sneakers.txt
[newuser@localhost newuser]$ ls -l sneakers.txt
-rw-r--r--  1 newuser newuser  143 Feb  6 06:45 sneakers.txt
[newuser@localhost newuser]$
```

Now, neither the group nor others have write permission to `sneakers.txt`. To return the group's write access for the file, add the value of `w` (2) to the second set of permissions.

```
chmod 664 sneakers.txt
```

WARNING

Setting permissions to 666 or 777 will allow everyone to read and write to a file or directory. These permissions could allow tampering with sensitive files, so in general, it's not a good idea to use these settings.

Here's a list of some common settings, numerical values and their meanings:

- `-rw-----` (600) — Only the owner has read and write permissions.
- `-rw-r--r--` (644) — Only the owner has read and write permissions; the group and others can read only.
- `-rwx-----` (700) — Only the owner has read, write and execute permissions.
- `-rwxr-xr-x` (755) — The owner has read, write and execute permissions; the group and others can only read and execute.
- `-rwx--x--x` (711) — The owner has read, write and execute permissions; the group and others can only execute.
- `-rw-rw-rw-` (666) — Everyone can read and write to the file. (Be careful with these permissions.)
- `-rwxrwxrwx` (777) — Everyone can read, write and execute. (Again, this permissions setting can be hazardous.)

Here are some common settings for directories:

- `drwx-----` (700) — Only the user can read, write in this directory.
 - `drwxr-xr-x` (755) — Everyone can read the directory, but its contents can only be changed by the user.
-

11 Managing Files and Directories

The GNOME and KDE file managers are powerful and important tools. Use these applications to help you create, edit, and delete files and directories, as well as accomplish other tasks throughout your system. This chapter will also discuss how to manage files and directories from the command line.

Permissions

Unless you're root, you won't be able to gain access to all the files and directories on your system. If you don't have the permission to open, delete or execute a file, you'll receive an error message that your access is denied.

See *Introductory Terms* for information on logging in with **su** (as opposed to **su -**) and Section 10.16, *Actions* for more on permissions.

This chapter will provide an overview of GMC and Konquerer, the file managers for GNOME and KDE. To learn more details about using them, read the *GNOME User's Guide* or the KDE user's documentation in their respective help browsers. You'll also be able to find the latest documentation at their websites: <http://www.gnome.org> and <http://www.kde.org>.

11.1 The GNOME File Manager

The GNOME File Manager lets you easily browse and work with files and directories. The proper name for the file manager is GNU Midnight Commander, or GMC, because it is GNOME's version of the popular Midnight Commander file manager.

You Can Still Use Midnight Commander

If you want to use Midnight Commander, you can start it in a shell prompt by typing **mc** at the prompt.

11.1.1 Using the File Manager

There are two ways to start GMC:

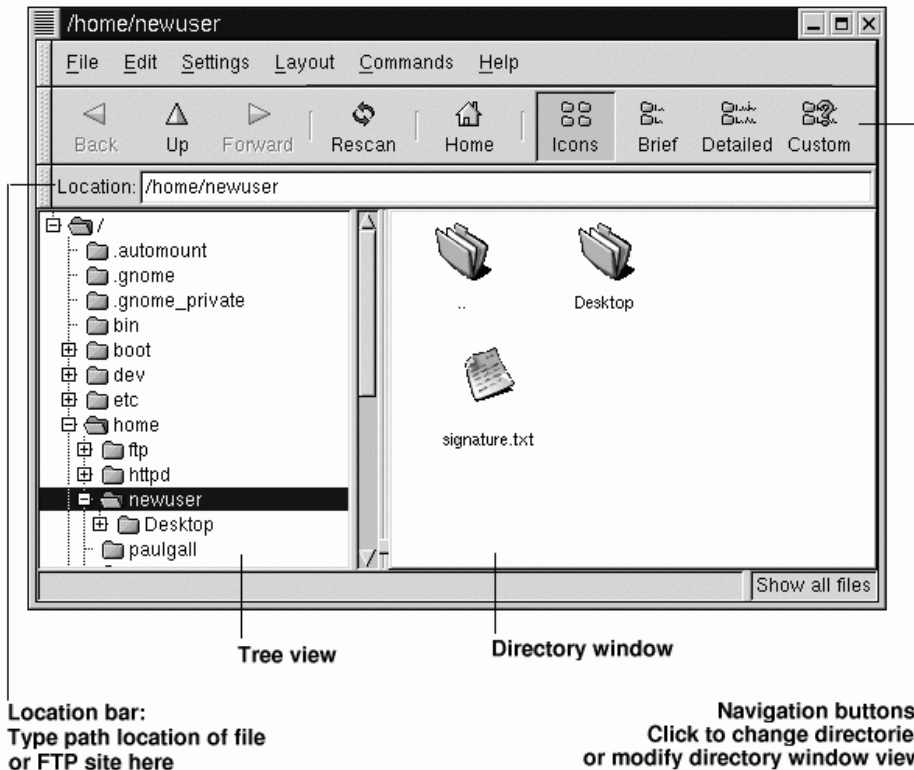
- From the **Main Menu Button**, click on **File Manager**.
-

- From the desktop, double-click on the file folder labeled **Home directory**, which looks like:



When you first open GMC, you'll see something similar to Figure 11–1, *A Sample GMC Window*.

Figure 11–1 A Sample GMC Window



As a new user, it's unlikely you'll find many new files or directories when you first open the file manager. That's because by default, GMC opens in your login directory. You will see the file `signature.txt` in Figure 11–1, *A Sample GMC Window*, if you created a signature file while configuring

Netscape Messenger. If you have not created a signature file and would like to, see *Creating a Signature* in Section 7.2.1 for instructions.

The tree view, to the left, will reveal all of the directories on your system. Single-click on a folder to reveal its contents in the directory window, at right. Folders which have a **+** next to them indicate that they include subdirectories and the view is collapsed; click on the **+** to expand the view and reveal the subdirectories.

Use the following buttons on the menu above the **Location** bar to determine the view you want:

- **Icons** — The default view. Displays icons to represent each file and directory type.
- **Brief** — Shows directories and files in a list, with directories at the top.
- **Detailed** — Shows a list, along with details such as the size and modification time of the files.
- **Custom** — Shows a customized detailed list (you can select items you want to include from the **Settings** menu, in **Preferences => Custom View**).

Changing the Order

If you view directory contents as lists, you can arrange your view of the list by clicking on one of the list headings. For example, if you want to see the contents alphabetically, click on the **Name** heading.

Navigation

Like many file managers, you can move around using the scrollbar next to the tree view.

You can also use the navigation buttons above the **Location** bar, similar to the way you would use the navigation buttons in Netscape Navigator:

- **Back** and **Forward** — Move you up or down through the directory listing history.
- **Up** — Moves you "up" the directory tree.
- **Rescan** — Refreshes the view of the current directory.
- **Home** — Lets you jump back to your default directory.

You can type a directory location straight into the **Location** bar. If you know the path where you want to go, for example `/etc/X11`, you can type it into the **Location** bar and press [Enter] to move to that location.

The **Location** bar lets you browse more than just your local system. If you're online, and you type in the location of an FTP site, such as `ftp://ftp.redhat.com`, you'll be able to see the files on

that site which are available for download. To download, just copy a file to a directory on your local machine.

Copying and Moving Files

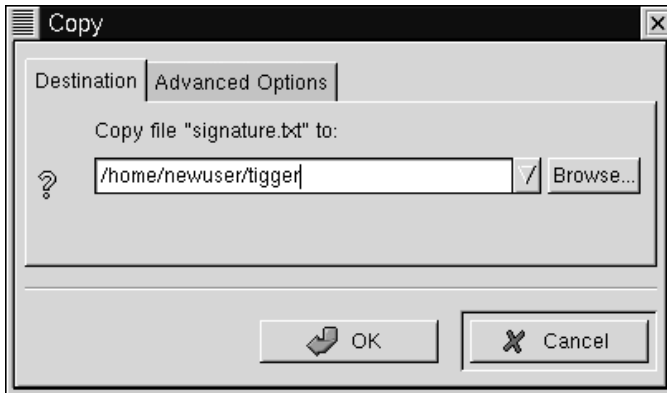
You can copy and move files from the directory window to your desktop or to another folder (that is, directory). If you want to move a file to your desktop, just drag and drop it on the desktop; by default, this action causes the file to be moved to your desktop.

If you'd prefer to copy the file rather than move it, click on the file, then drag it while holding down the [Shift] key.

Deciding Whether to Copy or Move a File

Not sure whether you want to move or copy a file? Use the [Alt] key when you drag a file. A pop-up menu will appear once you release the file, letting you choose whether to copy or move the file. You can also choose to link the file, which essentially is a shortcut to the file in its original location.

Figure 11–2 Copying File Dialog



If you know the path to the directory into which you want to copy a file, you can right-click on the file and choose **Copy** from the menu of options which opens. A dialog will appear, in which you can type the file's destination (as in Figure 11–2, *Copying File Dialog*).

In the **Advanced Options** tab of the **Copy** dialog, you can choose to **Preserve symlinks**, which will make certain that if the file you're copying is a symbolic link, or shortcut, it will be the same shortcut

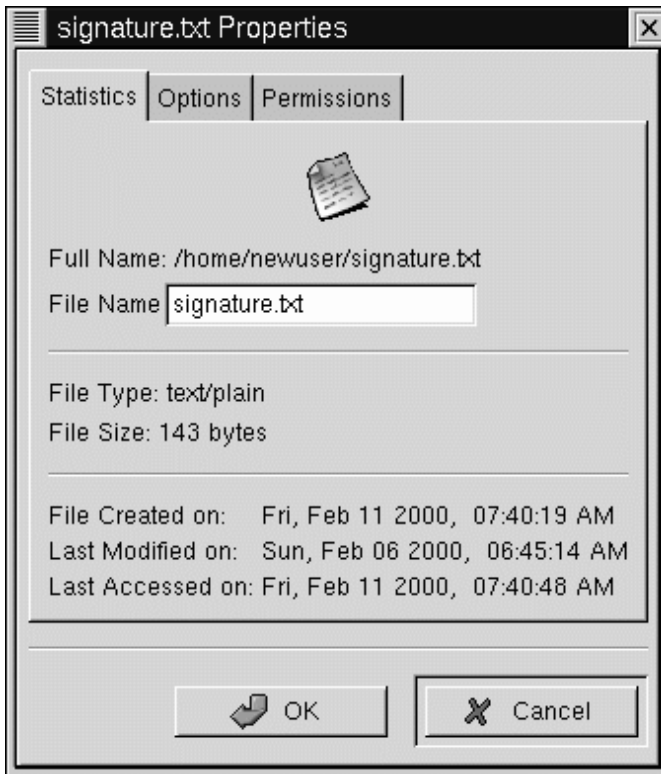
after it's copied. Rather than risk losing a shortcut, you should make certain you select this option if you're copying or moving a file that is a shortcut to another file.

Moving Using Right-Click

Just as you can copy a file by right-clicking, you can move a file by right-clicking on it and selecting **Move** from the menu that appears. If you want to rename the file while moving or copying it, type its new name in the **Copy** or **Move** box that appears. For example, if you want to copy the file `signature.txt` to `/home/newuser/tigger` and rename it `backup.txt`, you would type `/home/newuser/tigger/backup.txt`.

File Properties

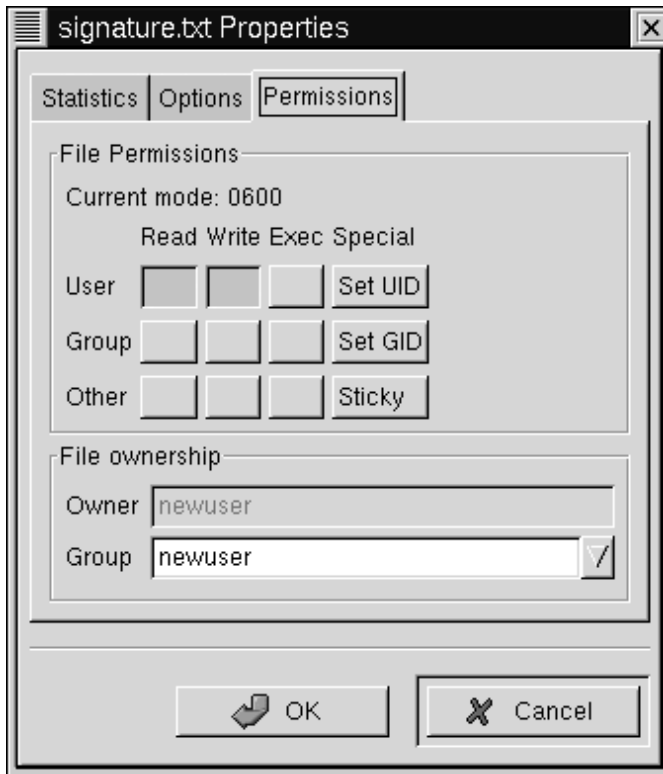
To change a file's properties, right-click on a file or directory in the directory window and choose **Properties**. A dialog, similar to Figure 11-3, *File Properties Dialog*, will open.

Figure 11–3 File Properties Dialog

On the **Statistics** tab, you'll find information about the file, such as the date and time it was created and modified.

In the **File Name** field, you can change the name of the file.

On the **Options** tab, you can change action options for the file, such as how the file will be opened, viewed, and edited. You probably won't have a reason to worry about these items; default settings are provided.

Figure 11–4 The Permissions Tab in File Properties

On the **Permissions** tab (see Figure 11–4, *The Permissions Tab in File Properties*), you can change the permissions and ownership of a file (that is, if you have the right permissions yourself). You can change the read, write, and execute settings, as well set UID, GID, and sticky bits.

UID, GID, and Sticky Bits?

Essentially, these items refer to user management and permissions. UID means User ID, a unique number given to every user on the system; GID means Group ID, the ID of the user's default group.

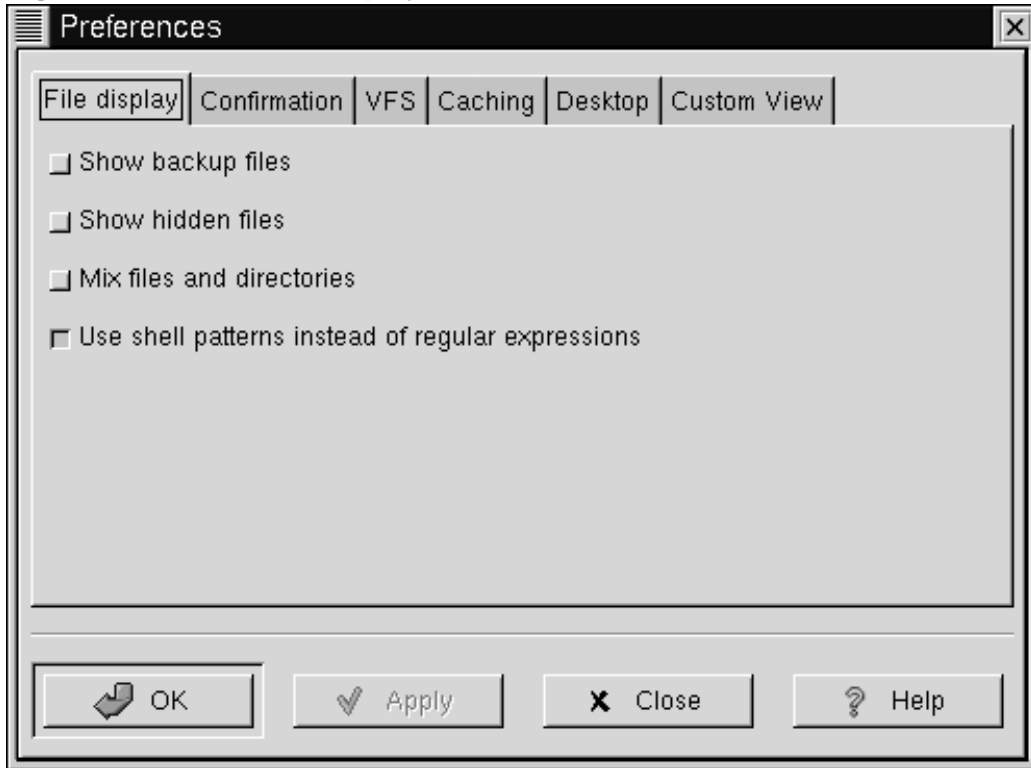
You probably won't have to worry about setting the sticky bit, but basically, setting a directory with a sticky bit gives it even more security. If a person wants to remove or rename a file that has a sticky bit, that person must own the file, own the directory, have "write" permission, or be root.

For more about how to work with permissions, see Section 10.16, *Actions*. Once you understand the ideas behind file permissions, you may find using the **Permissions** tab is a convenient way to change a file or directory's permission settings.

11.1.2 Setting GMC's Preferences

You can adjust quite a few settings for GMC in the **Preferences** dialog (**Settings => Preferences**); see Figure 11-5, *The File Display Tab in Preferences* for an example of the **Preferences** dialog.

Figure 11–5 The File Display Tab in Preferences



The dialog includes the following tabbed sections:

- **File display** — Modify the way files are viewed. Select **Show backup files** to reveal backup files. Select **Show hidden files** to show **dot files** (usually configuration files and directories). **Mix files and directories** allows you to see files and directories in the order you select in the directory window. You probably will not need to worry about the **Use shell patterns...** choice, since it concerns sorting with regular expressions, which is more useful to advanced users.
- **Confirmation** — Select whether you should be required to confirm any decision to delete, overwrite, and execute files. You can also choose whether you want to see a progress indicator while the actions are being executed.
- **VFS** — VFS means Virtual File System. VFS means that you can work with files which aren't on your local machine. Information in this tab applies to actions related to FTP sites. **VFS Timeout**

refers to the time (in seconds) you can be connected without activity, before you're disconnected. The entry in **Anonymous FTP password** refers to the identification you want to be sent during anonymous logins at FTP sites (typically, this is your email address). Enable the option to **Always use FTP proxy** if you're required to use a proxy to connect to FTP sites.

- **Caching** — These settings may help to increase the speed of GMC. Select **Fast directory reload** to store directory information in memory to speed the load time. Using this option may not always result in an updated display, however. **Compute totals before copying files** will cause GMC to calculate the number of files you're copying so it can provide information to you about the task. **FTP directory cache timeout** is the length of time (in seconds) to hold information about an FTP site in memory. **Allow customization of icons in icon view** lets you change the icon style in the directory window. Note that checking this may decrease performance.
- **Desktop** — Here, you can specify ways to view the items on your desktop. Click inside the **Icon position** box to specify how the icons should be aligned on your desktop. Select **Automatic icon placement** to arrange icons on your desktop automatically, rather than arranging them manually. Click **Snap icons to grid** if you want icons on the desktop to be aligned. **Use shaped icons** and **Use shaped text** allow the icons and related text labels to be semi-transparent on your desktop, rather than "blocky" icons and labels.
- **Custom View** — In this dialog, you can specify the additional information you want to see when you select the **Custom** button from GMC's menu.

11.2 The KDE File Manager

Like GNOME's file manager, Konquerer is a graphical tool you can use to view and work with directories and files.

Useful Online and Offline

Because Konquerer uses HTML to display information, it can be used as a Web browser, as well as a browser for the files on your system. Just type a Web address (a URL) into the **Location** bar when you're online, and you'll jump to your chosen website.

11.2.1 Using Konquerer

The easiest ways to start Konquerer are:

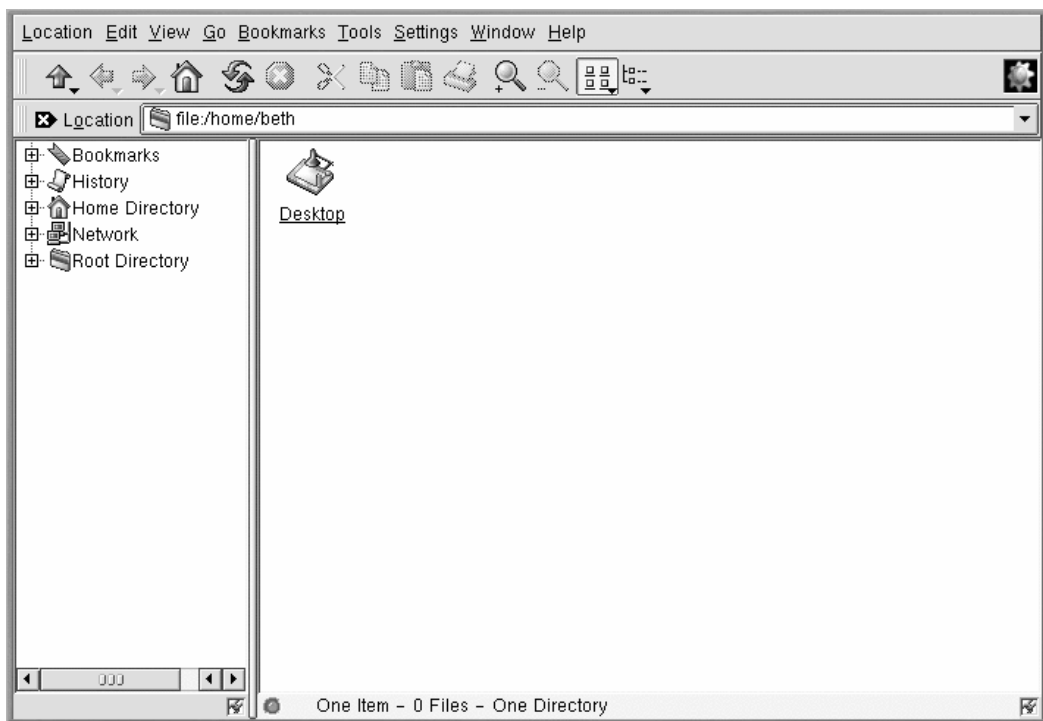
- From the **Main Menu K** icon — Click on the **Home Directory** entry.
-



- From the panel — Click on the **Home Directory** icon, which looks like:

When your home directory window opens, you'll see something similar to Figure 11–6, *A Sample Konquerer Window*. By default, the view contains icons and links to associated files on your system. You can change the view, using the **View** menu.

Figure 11–6 A Sample Konquerer Window



In fact, you have quite a few choices for viewing files and directories in the content area; when you select (or deselect) a choice, the content area will refresh with your new view. Some of the options under **View** are:

- **View Mode** — Select the way you want the icons to appear in the Konquerer window.
- **Icon Size** — Determine the size of the icons.

- **Show Hidden Files** — View hidden files (also called "dot files") in the Konquerer window. Hidden files are usually configuration files and are not often accessed by users.
- **Use index.html** — Select this view if you want to see a directory as a Web page. This can be fun if you know HTML, or want to learn how to write a Web page. All you have to do is name your file `index.html`, and place your content as links in the file. When Konquerer opens the directory, it will open the `index.html` file.

Click once on a file to open the file in its associated application. For example, the file `signature.txt` is a text file. Click on it to open `kedit`, KDE's text editor.

To open a directory, click once on the corresponding file folder.

Express Yourself With Backgrounds

Want to give the content area a colorful image background? Just right-click inside the content area of a Konquerer window, go to the **Dir** tab, and you can change your background. If you want to use one of the included backgrounds, select an image from the pulldown list.

Note, however, that some of the included backgrounds will probably put a strain on your eyesight. With names such as **spoiled_sprouts** and **ring-worm_circus**, you shouldn't expect a soothing visual experience. You can also select a background of your own by clicking on the **Browse** button and picking an image elsewhere on your system (for example, an image file in your `/home` directory).

If you prefer to change only the color, you can modify the color settings by going to the menu and clicking **Options => Configure File Manager**. Change the background by selecting the **Color** tab; you can change the fonts by selecting the **Font** tab.

Navigation

If you've used a Web browser or file manager before, you'll find that moving around with Konquerer seems familiar. You can type the path location of a file (and the address of a website or FTP site) in the **Location** bar. Above the **Location** bar, icons on the **Navigation bar** help you quickly move to other directories. Briefly, here's a description of some of the icons:

- The arrow pointing up will take you up the directory tree. For example, if you're in `/home/newuser` and you click on the up arrow, you will move to `/home`; click once more, and you'll be at `/`, or root (the root of your filesystem, that is, not the *root account's* login directory).
-

- Click on the arrow pointing left to take you to a previously viewed directory. Click on the arrow pointing right to move forward through your navigation history.
- To jump to your home location, such as `/home/newuser`, just click on the home icon.
- Click on the circular arrows to refresh your view of the current content area.
- To get help, click on the question mark.
- To stop loading a page or directory in the content area, click on the traffic light.

To open a new Konquerer window, just click on the KDE icon (which looks like a gear) on the far right of the navigation bar.

Drag and Drop to Open, Move, and Copy

Keeping important documents and applications within easy reach is simple with Konquerer. To open a text file, for example, you can drag it from the content area of Konquerer by left-clicking on it and holding your mouse button down while you drag it. If you drop the file in an open text editor, it will open, ready for you to modify its contents.

In the same way, you can drag and drop files from the content area to your desktop or to other folders. When you reach your destination, a pop-up menu will offer you the choice of copying, moving or linking the file. If you select **Link** from the menu, any changes you make to a file in its new location will be reflected in the original location. A link is like a shortcut to the original file.

11.3 Creating Files and Directories in KDE

To create an empty file, move to your login directory and use the `touch` command at the shell prompt. To try it, type:

```
touch foo.bar
```

Now, in your login directory, you've got an empty file called `foo.bar`.

Let's also create a new directory, using the `mkdir` command.

Move to your login directory and type:

```
mkdir tigger
```

Now, you've created a directory called `tigger` in your login directory. Your new directory's absolute pathname is `/home/yourlogin/tigger`, and your home directory is the parent of `tigger`.

11.4 A Larger Picture of the Filesystem

Every operating system has a method of storing its files and directories so that it can keep track of additions, modifications, and other changes.

In Linux, every file is stored on the system with a unique name, in directories which can also hold other files and directories (or subdirectories).

You might think of the system as a tree-like structure, in which directories "branch off." Those directories may contain, or be the "parent" of, other directories which may hold files or directories of their own.

There wouldn't be a tree without a root, and the same is true for the Linux filesystem. No matter how far away the branches, everything is connected to the root, which is represented as a single forward slash (/).

Red Hat Linux uses the term "root" in several different ways, which might be confusing to new users. There's the root account (the superuser, who has permission to do anything), the root account's login directory (/root) and the root directory for the entire filesystem (/). When you are speaking to someone and using the term "root," be sure you know which root you are talking about."

What is the FHS?

Other Linux distributions exist, and your Red Hat Linux system is probably compatible with them because of the Filesystem Hierarchy Standard (FHS). The FHS guidelines help to standardize the way system programs and files are stored on all Linux systems.

To read more about the FHS, turn to the chapter on system administration in the *Red Hat Linux Reference Guide*. You can also visit the FHS website: <http://www.pathname.com/fhs>.

As long as you're logged into your user account (which will help prevent disastrous mistakes), it might be helpful to take a look around.

First, take a look at the root directory. This will help give a larger picture of where things are.

At the shell prompt, type:

```
cd /
```

You'll see a prompt that looks like:

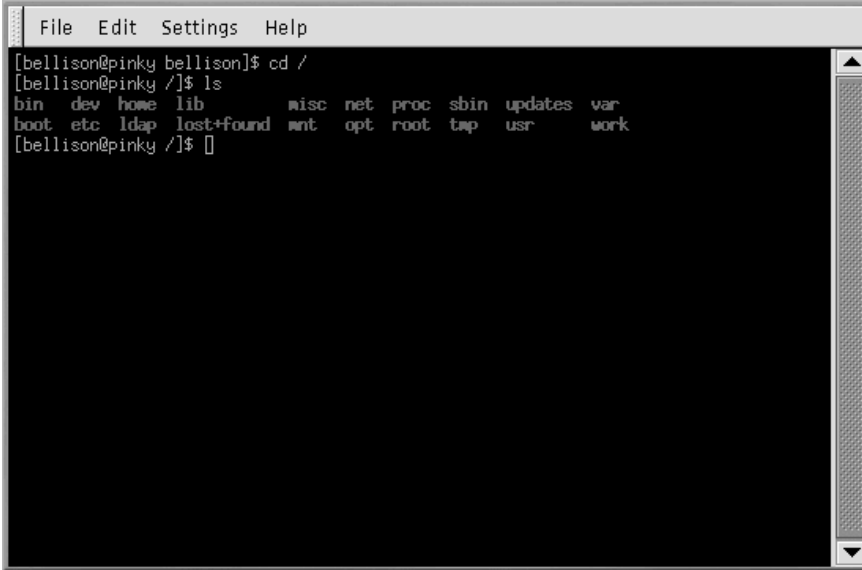
```
[newuser@localhost ~]$
```

Now, take a look at which directories "branch off" the root directory by typing:

```
ls
```

This is a little like viewing the tip of an iceberg. The directories you see are the parent directories of other directories, in which there may be other directories, and so on.

Figure 11–7 A View of the Directories from Root

A terminal window with a menu bar containing 'File', 'Edit', 'Settings', and 'Help'. The terminal text shows a user named 'bellison' on a machine named 'pinky' navigating to the root directory and listing its contents. The output of the 'ls' command is: 'bin dev home lib misc net proc sbin updates var boot etc ldap lost+found mnt opt root tmp usr work'.

```
[bellison@pinky bellison]$ cd /
[bellison@pinky /]$ ls
bin dev home lib misc net proc sbin updates var
boot etc ldap lost+found mnt opt root tmp usr work
[bellison@pinky /]$
```

Here are just a few of the directories you're likely to find:

```
etc      lib      sbin
usr      var
```

There are more, but for now, take a look at the `/etc` directory.

```
[newuser@localhost /]$ cd etc
[newuser@localhost /etc]$ ls
```

Here, among other things, you'll find configuration files, which are files that help make programs work for your system, store program and system settings, and more.

Among the directories in here, you'll see `/etc/X11`, which also contains directories and configuration files for the X Window System.

In the directory `/etc/skel`, you'll find skeleton user files, which are used to populate newly created user accounts with standard, commonly used files.

What's a skeleton file? Well, when you were logged in as root, one of the first things you did was create a user account. When that user account was created, files were taken from `/etc/skel` and placed into the new account. The `/etc/skel` files are the standard files needed by every new account.

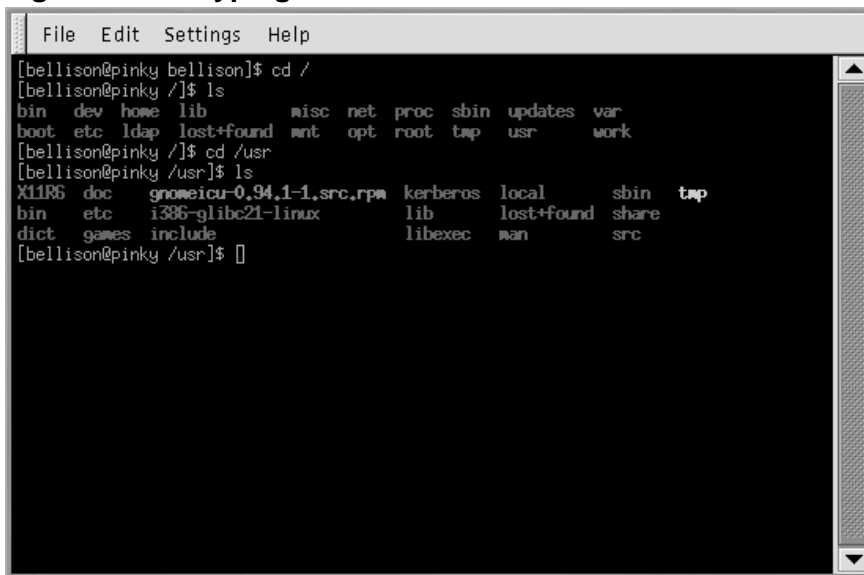
Look around a little in the `/usr` directory. From your current location in `/etc/skel`, type:

```
[newuser@localhost /skel]$ cd /usr
[newuser@localhost /usr]$ ls
```

If you forgot, `cd /usr` moves you to the `/usr` directory and `ls` lists the files in that directory.

In `/usr`, you'll see a number of directories that hold some of your system's most important programs and files (see Figure 11–8, *Typing ls in /usr*).

Figure 11–8 Typing ls in /usr



```
File Edit Settings Help
[bellison@pinky bellison]$ cd /
[bellison@pinky /]$ ls
bin  dev  home  lib          misc  net  proc  sbin  updates  var
boot  etc  ldap  lost+found  mnt   opt  root  tmp   usr      work
[bellison@pinky /]$ cd /usr
[bellison@pinky /usr]$ ls
X11R6  doc      gnomeicu-0.94.1-1.src.rpm  kerberos  local      sbin      tmp
bin    etc      i386-glibc21-linux        lib        lost+found  share
dict   games    include                    libexec    man        src
[bellison@pinky /usr]$
```

In `/usr/share/man`, you'll find the system manual pages; other documentation that isn't covered by man pages will be found in `/usr/share/doc` and in `/usr/share/info`.

In `/usr/X11R6`, you'll find files related to the X Window System, including configuration and documentation files.

In `/usr/lib` you'll find files which are considered libraries for your system. Libraries contain commonly used code that can be shared by many programs.

Red Hat Linux uses the RPM technology of software installation and upgrades. Using RPM, either from the shell prompt or through `Gnome-RPM`, is a safe and convenient way to upgrade or install software. For more information about using `Gnome-RPM`, see the *Official Red Hat Linux Customization Guide*.

Once you become more comfortable with your system, you may want to install software not available in RPM format. To minimize collisions with RPM-managed files, the best place to put such software is in `/usr/local`.

11.5 Identifying and Working with File Types

If you're new to Linux, you may see files with extensions you don't recognize. A file's extension is the last part of a file's name, after the final dot (in the file `sneakers.txt`, "txt" is that file's extension).

Here's a brief listing of extensions and their meanings:

11.5.1 Compressed/Archived Files

- `.Z` — a compressed file
- `.tar` — an archive file (short for *tape archive*)
- `.gz` — a compressed file (gzipped)
- `.tgz` — a tarred and gzipped file

For information on creating zip and tar files, see Section 11.6, *File Compression and Archiving — Gzip, Zip, and Tar*

11.5.2 File Formats

- `.txt` — a plain ASCII text file
- `.html/.htm` — an HTML file
- `.ps` — a PostScript file; formatted for printing
- `.au` — an audio file
- `.wav` — an audio file
- `.xpm` — an image file
- `.jpg` — a graphical or image file, such as a photo or artwork
- `.gif` — a graphical or image file
- `.png` — a graphical or image file
- `.pdf` — an electronic image of a document

For information on viewing and creating PDF files, see Section 11.7, *Viewing PDFs*

11.5.3 System Files

- `.rpm` — a Red Hat Package Manager file
- `.conf` — a configuration file
- `.a` — an archive file
- `.lock` — a "lock" file; determines whether a program is in use

11.5.4 Programming and Scripting Files

- `.h` — a C or C++ program language header file
- `.c` — a C program language source code file
- `.cpp` — a C++ program language source code file
- `.o` — a program object file
- `.pl` — a Perl script
- `.tcl` — a TCL script
- `.so` — a library file

But file extensions are not always used, or used consistently. So what happens when a file doesn't have an extension, or the file doesn't seem to be what the extension says it's supposed to be?

That's when the `file` command can be helpful.

In Section 10.11.1, *Using Redirection*, you created a file called `saturday`, without an extension. Using the `file` command, you can tell what the file is by typing:

```
file saturday
```

and you'll see **ASCII text**, or something similar, telling you it's a text file. Any file that's designated a text file should be readable using `cat`, `more`, or `less`.

Read the Man Page

To learn more about `file`, read the man page by typing `man file`.

For more information on helpful commands for reading files, see Chapter 10, *Shell Prompt Basics*.

11.6 File Compression and Archiving — Gzip, Zip, and Tar

11.6.1 Compressing with Gzip and Zip

Compressed files use less disk space and download faster than large, uncompressed files. You can compress Linux files with the open-source compression tool Gzip or with Zip, which is recognized by most operating systems.

By convention, compressed files are given the extension `.gz`. The command **Gzip** creates a compressed file ending with `.gz`; **Gunzip** extracts the compressed files and removes the `.gz` file.

To compress a file, at a shell prompt, type the following command:

```
gzip filename.ext
```

The file will be compressed and saved as `filename.ext.gz`.

To expand a compressed file, type:

```
gunzip filename.ext.gz
```

The `filename.ext.gz` is deleted and replaced with `filename.ext`.

If you exchange files with non-Linux users, you may want to use **zip** to avoid compatibility problems. Red Hat Linux can easily open zip or gzip files, but non-Linux operating systems may have problems with gzip files.

To compress a file with **zip**, type the following:

```
zip -r filename.zip files
```

In this example, *filename* represents the file you are creating and *files* represents the files you want to put in the new file:

To extract the contents of a zip file, type:

```
unzip filename.zip
```

You can zip or gzip multiple files at the same time. List the files with a space between each one.

```
gzip filename.gz file1 file2 file3 /user/work/school
```

The above command will compress `file1`, `file2`, `file3`, and the contents of the `/user/work/school` directory and put them in `filename.gz`.

11.6.2 Archiving with Tar

Tar files place several files or the contents of a directory or directories in one file. This is a good way to create backups and archives. Usually, tar files end with the `.tar` extension.

To create a tar file, type:

```
tar -cvf filename.tar files/directories
```

In this example, `filename.tar` represents the file you are creating and `files/directories` represents the files or directories you want to put in the new file.

You can use absolute or relative pathnames for these files and directories (for more on pathnames, see Section 10.7, *Changing Directories with cd*). Separate the names of files and directories with a space.

The following input would create a tar file using absolute pathnames:

```
tar -cvf foo.tar /home/mine/work /home/mine/school
```

The above command would place all the files in the `/work` subdirectory and the `/school` subdirectory in a new file called `foo.tar` in the current working directory.

The command `tar -cvf foo.tar file1.txt file2.txt file3.txt` would place `file1.txt`, `file2.txt` and `file3.txt` in a new file called `foo.tar`.

To list the contents of a tar file, type:

```
tar -tvf foo.tar
```

To extract the contents of a tar file, type:

```
tar -xvf foo.tar
```

This command does not remove the `.tar` file, but it places copies of the `.tar` contents in the current working directory.

The `tar` command does not compress files automatically. You can compress tar files with:

```
tar -czvf foo.tar
```

Compressed tar files are conventionally given the extension `.tgz` and are compressed with `gzip`.

To expand a compressed tar file type:

```
tar -xzvf foo.tgz
```

11.7 Viewing PDFs

A PDF (Portable Document Format) file is an electronic image of a document. Red Hat Linux gives you several options for viewing PDFs.

An open source application called `xpdf` is included with Red Hat Linux. The `xpdf` tool is well-developed and easy to use. Right-click inside the screen to see a list of menu options. The toolbar at the bottom has navigational tools that let you move backwards and forwards through the document, as well as standard zoom, print, and find tools. The `xpdf` man page provides lots of useful information on `xpdf` options (open a shell prompt and type `man xpdf` at the command line).

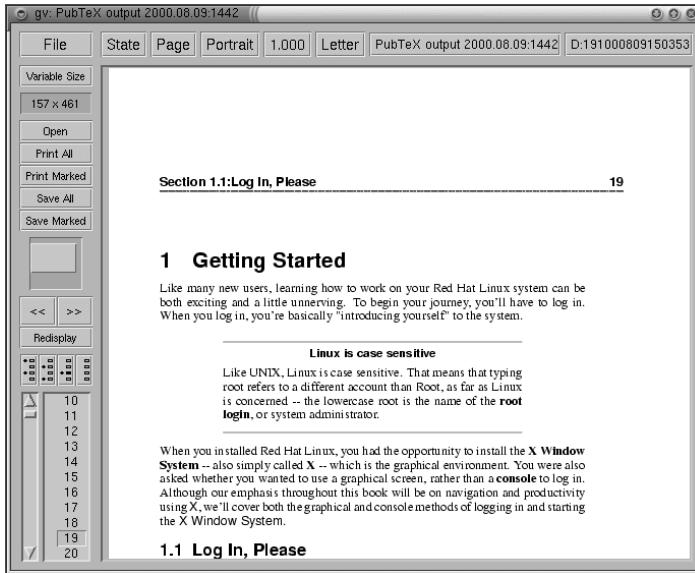
To view a PDF with `xpdf`:

1. Go to **Main Menu => Applications => xpdf**
2. Right click in the `xpdf` screen to display a list of options.
3. Select **Open** to display a list of files.
4. Select the PDF file you want to view and click on **Open**.

Another open source application called `Ghostview` comes with Red Hat Linux and allows you to view and navigate through PostScript™ and PDF files (for information on PostScript go to <http://www.cs.wisc.edu/~ghost/index.htm>). To view a PDF with `Ghostview`:

1. Select **Main Menu => Graphics => Ghostview**.
 2. Select **File => Open** to display a list of available files.
 3. Select the PDF or PostScript file you want to view and click on **Open File**.
-

Figure 11–9 A PDF in Ghostview



PDF Conversion

A quick way to convert a PDF to PostScript is to open a shell prompt and type:

```
pdf2ps input.pdf output.ps
```

`input.pdf` is the file you want to convert and `output.ps` is the new PostScript file you want to create.

The **pdf2ps** command is part of the Ghostscript tool. To see the location of Ghostscript documentation on your system, type `gs -h` at a shell prompt.

The Ghostview user manual is available at <http://wwwthep.physik.uni-mainz.de/~plass/gv/>.

Ghostview and Ghostscript

Ghostview is an interface for Ghostscript. Ghostscript is a PostScript interpreter, a PDF interpreter, and a conversion tool. For more information, go to <http://www.pdflib.com/gsmmanual/index.html>.

Adobe Acrobat Reader is not included in Red Hat Linux, but you can download it free of charge at <http://www.adobe.com/>.

11.8 Copying, Moving, Renaming, and Deleting Files

By now, you've learned a little about the structure of the filesystem and you've learned how to create files and directories.

But just because you know how to create files and directories doesn't mean that you have to keep the changes you've made. This section explains how to copy, move, rename, and delete files and directories.

11.8.1 Copying Files

Like so many Linux features, you have a variety of options from which to choose when you want to manipulate files and directories. You can also use wildcards when you're copying, moving, or deleting files and directories.

To copy a file, type the following command:

```
cp <source> <destination>
```

So, to copy the file `sneakers.txt` to the directory `tigger` in your login directory, move to your login directory and type:

```
cp sneakers.txt tigger
```

Notice that you also used relative pathnames to copy the file. You can use both relative and absolute pathnames with `cp`. Our login directory is the parent of the directory `tigger`; `tigger` is one directory down from our login directory.

Read the `cp` man page (`man cp`) for a full list of the options available with `cp`. Among the options you can use with `cp` are the following:

- `-i` — interactive. Prompts you to confirm if the file is going to overwrite a file in your destination. This is a handy option because it can help prevent you from making mistakes.
 - `-r` — recursive. Rather than just copying all the files and directories, this will copy the whole directory tree, subdirectories and all.
-

- `-v` — verbose. shows the progress of the files being copied.

If you use `cp` with no options, you won't see much when the command is executed. Using an option, such as `-i`, can make the process a little more useful. If you want to copy a file to a location that already has a file with the same name, you'll be asked first if you really want to overwrite (or replace) the file that's already there.

Now that you have the file `sneakers.txt` in the `tigger` directory, use `cp -i` to copy the file again to the same location.

```
[newuser@localhost newuser]$  
cp -i sneakers.txt tigger  
cp: overwrite 'tigger/sneakers.txt'?
```

To overwrite the file that's already there, press [Y] and then [Enter]. Don't want to overwrite the file? Press [N] and [Enter].

11.8.2 Moving Files

To move files, use the `mv` command. It is similar to the `cp` command, except that with `mv` the file is physically moved from one place to another, instead of being duplicated, as with `cp`. For more about `mv`, see the `mv` man page (type `man mv`).

Common options for `mv` include the following:

- `-i` — interactive. This will prompt you if the file you've selected will overwrite an existing file in the destination directory. This is a good option, because like the `-i` option for `cp`, you'll be given the chance to make sure you want to replace an existing file.
- `-f` — force. Overrides the interactive mode and moves without prompting. Unless you know what you're doing, this option is dangerous; be very careful about using it until you become more comfortable with your system.
- `-v` — verbose. Shows a list of the files being moved.

If you want to move a file out of your home directory and into another directory, type the following (you'll need to be in your home directory):

```
mv sneakers.txt tigger
```

Alternatively, the same command using absolute pathnames looks like `mv sneakers.txt /home/newuser /home/newuser/tigger`.

11.8.3 Renaming Files

Actually, we've already covered half of renaming, because when you copy or move files, you can also rename.

To copy the file `sneakers.txt` from your login directory to the `tigger` subdirectory, just type:

```
cp sneakers.txt tigger
```

To copy and rename that file from `sneakers.txt` to `piglet.txt`, type:

```
cp sneakers.txt tigger/piglet.txt
```

To *move* and rename the file, just substitute **mv** for **cp** in the above example.

If you **cd** to `tigger` and then type **ls**, you'll see the file `piglet.txt`.

If you just want to rename the file and keep its location, just **mv** in your current directory:

```
mv sneakers.txt piglet.txt
```

11.8.4 Deleting Files and Directories

You learned about creating files with the **touch** command and by using redirection in Chapter 10, *Shell Prompt Basics*. And you created the directory `tigger` using **mkdir**.

Now you need to learn how to delete files and directories. Deleting files and directories with the **rm** command is a straightforward process. See the `rm` man page for more information. Options for removing files and directories include:

- **-i** — interactive. Prompts you to confirm the deletion. This option can stop you from deleting a file by mistake.
- **-f** — force. Overrides interactive mode and removes the file(s) without prompting. This might not be a good idea, unless you know exactly what you're doing.
- **-v** — verbose. Shows a list of files as they're being removed.
- **-r** — recursive. Will delete a directory and all (if any) files and the subdirectories it contains.

To delete the file `piglet.txt` from the `tigger` directory with the **rm** command:

```
rm piglet.txt
```

What happens if you didn't really want to get rid of it? Too late! That's where the **-i** (interactive) option is helpful, because it gives you a second chance to think about whether or not you really want to delete the file.

```
[newuser@localhost newuser]$  
rm -i piglet.txt  
rm: remove 'piglet.txt'?
```

You can also delete files using the wildcard `*`, but be careful, because you can easily delete files you didn't intend to throw away.

To remove a file using a wildcard, you would type:

```
rm pig*
```

The above command will remove all files in the directory which start with the letters "pig."

You can also remove more than one file using one command:

```
rm piglet.txt sneakers.txt
```

Options for removing files and directories include the following:

- `-i` — interactive. Prompts you to confirm the deletion. This option can stop you from deleting a file by mistake. .
- `-f` — force. Overrides interactive mode and removes the file(s) without prompting. This might not be a good idea, unless you know exactly what you're doing.
- `-v` — verbose. Shows a list of files as they're being removed.
- `-r` — recursive. Will delete a directory and all (if any) files and the subdirectories it contains.

You can use `rmdir` to remove a directory (`rmdir foo`, for example), but only if the directory is empty. To remove directories with `rm`, you must specify the `-r` option.

For example, if you want to recursively remove the directory `tigger` you would type:

```
rm -r tigger
```

If you want to combine options, such as forcing a recursive deletion, you can type:

```
rm -rf tigger
```



The `rm` command can delete your entire filesystem! If you're logged in as root and you type the simple command `rm -rf /`, you're in trouble; this command will recursively remove everything on your system.

A safer alternative to using `rm` for removing directories is the `rmdir` command. With this command, you won't be allowed to use recursive deletions, so a directory which has files in it won't be deleted.

Read the `rmdir` man page (`man rmdir`) to find out more about this command.

12 Updating With Red Hat Network and Red Hat Errata

12.1 Red Hat Network and Red Hat Errata

Red Hat Network and the Red Hat errata list both give you the packages and tools you need to update your system with the latest security patches, bug fixes, and package enhancements. Red Hat Network does much of the work automatically, as opposed to the manual procedure of updating from the errata list. This chapter covers the basics for both.

Please note that this chapter is not intended to serve as a complete reference guide for Red Hat Network or errata. Go to <http://www.redhat.com/support/manuals/RHNetwork/ref-guide/> for the *Red Hat Network User Reference Guide* and <http://www.redhat.com/support/errata/> for the latest errata and information on downloading and installing.

12.2 What is Red Hat Network?

Red Hat Network is an Internet solution for managing a Red Hat Linux system or a network of Red Hat Linux systems. All security patches, bug fixes, and software package enhancements can be downloaded directly from Red Hat Linux using the Red Hat Update Agent, a standalone application, or through a Web browser, at <http://www.redhat.com/network>. The features available to you are determined by your membership status.

Both the Red Hat Network Web interface and the Red Hat Update Agent allow you to view all security alerts, bug fixes, and package enhancements included in the errata list. Only packages relevant to your system are shown, and you can configure Red Hat Network to send you email notifications of new and updated packages. These tools can be configured to verify packages once they are downloaded.

The Red Hat Network Web interface runs inside an SSL-enabled Web browser, such as Netscape Navigator, and does not have software dependencies. It has more features than Red Hat Update Agent, including the ability to view up to five systems simultaneously, view package details before downloading, and add a system to your account without registering again.

Red Hat Network provides significant benefits to your network security and quality assurance. All transactions between you and Red Hat Network are encrypted, and all RPM packages are signed with Red Hat Linux's GNU Privacy Guard (GPG) signature to ensure authenticity. See the Official Red Hat Linux Customization Guide for more on the GPG.

Before you begin using Red Hat Network, you need to create a user name, password, and system profile. The Red Hat Network Registration Client will take you through this process.

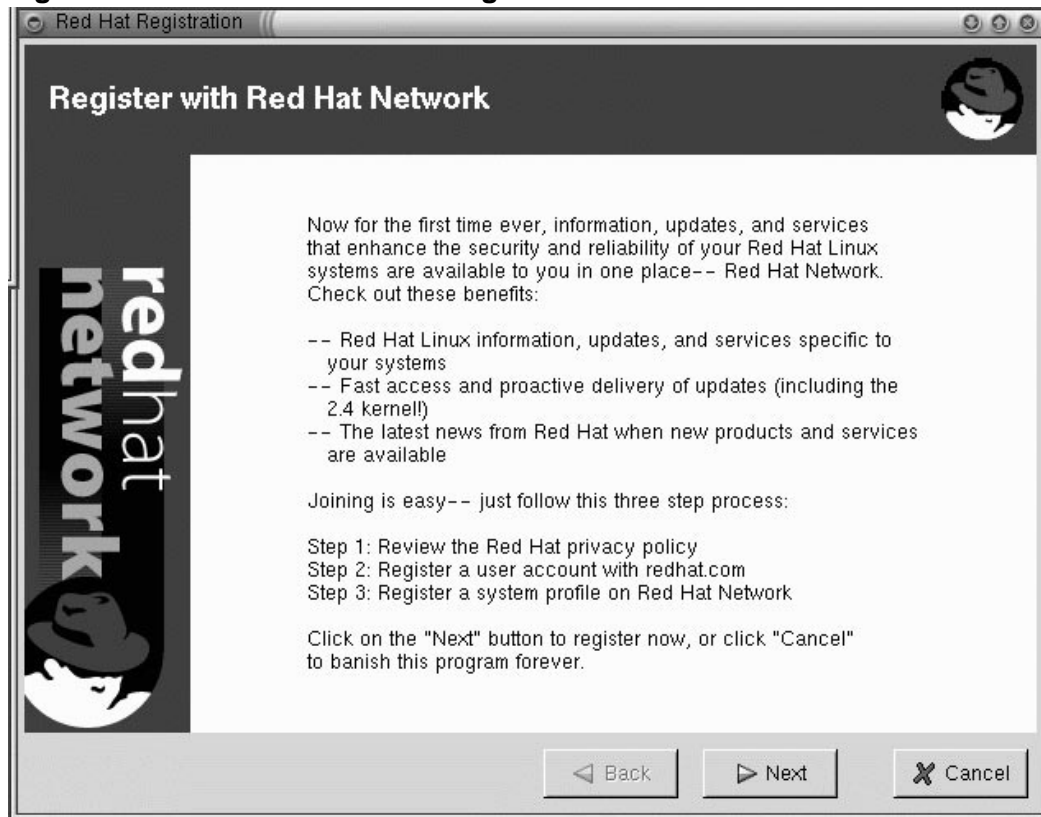
12.3 Red Hat Network Registration Client

You must be logged in as root (or at least know the root password) to register a system with Red Hat Network. If you start the Red Hat Network Registration Client as a standard user, you will be prompted to enter the root password before you can proceed.

To start the Red Hat Network Registration Client, use one of the following methods:

1. From the GNOME desktop, go to **Main Menu => Programs => System => RHN Registration**.
2. From the KDE desktop, go to **Main Menu => System => Update Agent**.
3. At a shell prompt, type `rhnclean`.

Figure 12–1 Red Hat Network Registration Client



12.4 Red Hat Update Agent

If you choose to use the Red Hat Update Agent, you should configure the settings first. This can be done using the Red Hat Update Agent Configuration Tool.

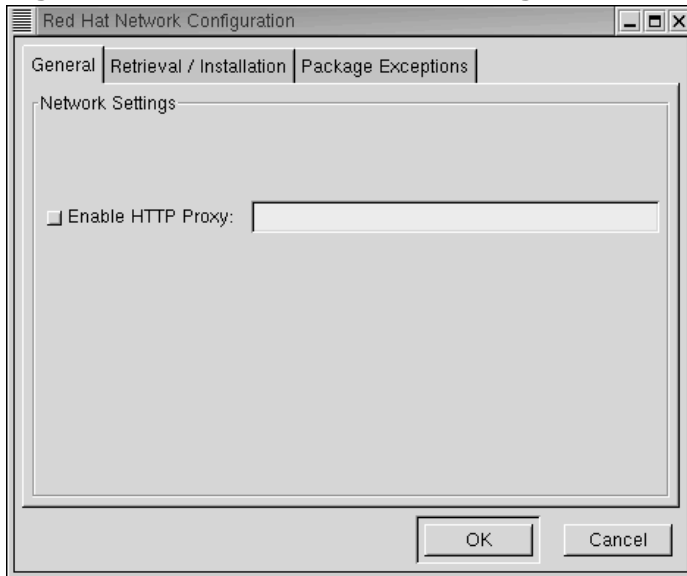
You must be root to run the Red Hat Update Agent Configuration Tool. If you try as a standard user, you will be prompted to enter the root password before you can continue.

12.4.1 Configuring Red Hat Update Agent

The Red Hat Update Agent Configuration Tool can be started using one of the following methods:

1. From the GNOME desktop, go to **Main Menu => Programs => RHN Configuration** (or **Update Agent Configuration** for older versions of Red Hat Update Agent).
2. From the KDE desktop, go to **Main Menu => RHN Configuration** (or **Update Agent Configuration** for older versions of Red Hat Update Agent).
3. At a shell prompt, type `up2date-config`.

Figure 12–2 Red Hat Network Configuration Tool

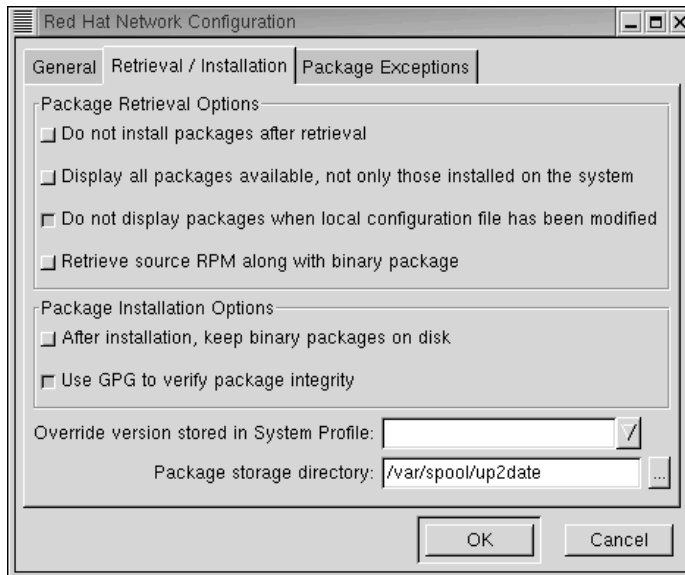


The only option on the **General** tab (see Figure 12–2, *Red Hat Network Configuration Tool*) is **Enable HTTP proxy**. If your computer is on a network, it probably accesses the Internet through a proxy and

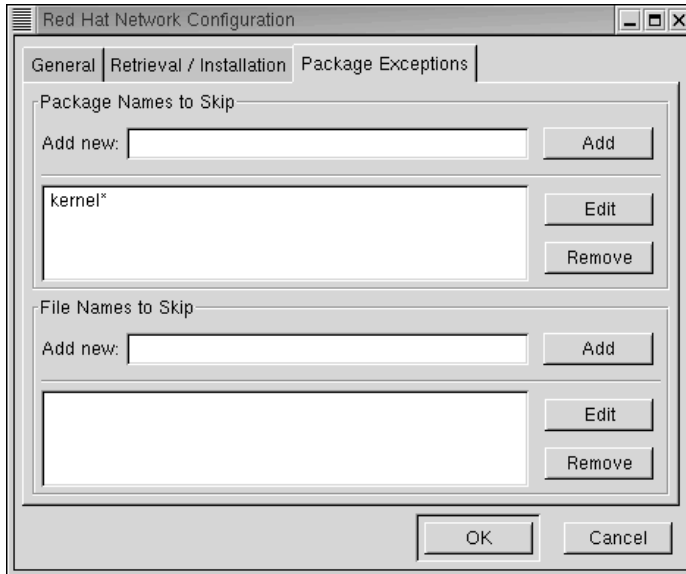
you will need to select this option. Contact your IT department to find out the proxy information you need to enter in the field on this tab.

On the **Retrieval/Installation** tab (see Figure 12–3, *Red Hat Network Configuration Tool Retrieval/Installation Tab*), you set whether or not Red Hat Update Agent automatically installs updates once they are retrieved, whether you are informed of all available updates or just those pertinent to your system, and more.

Figure 12–3 Red Hat Network Configuration Tool Retrieval/Installation Tab



On the **Package Exceptions** tab (see Figure 12–4, *Red Hat Network Configuration Tool Package Exceptions Tab*), you can tell Red Hat Update Agent not to inform you of certain types of files or packages. Use the **Add**, **Edit**, and **Remove** buttons to manage the lists of files and packages to skip.

Figure 12–4 Red Hat Network Configuration Tool Package Exceptions Tab

For more detailed information, see the *Red Hat Network User Reference Guide* at <http://www.redhat.com/support/manuals/RHNetwork/ref-guide/>.

After configuring the settings, you can use the Red Hat Update Agent to retrieve the latest software packages from Red Hat Linux.

Starting Red Hat Update Agent

You must be root to run the Red Hat Update Agent. If you start the Red Hat Update Agent as a regular user, you will be prompted to enter the root password before you can proceed. The Red Hat Update Agent can be started using one of the following methods:

1. From the GNOME desktop, go to **Main Menu => Programs => System => RHN Update Agent**.
2. From the KDE desktop, go to **Main Menu => System => RHN Update Agent**.
3. At a shell prompt, type **up2date**.

Figure 12–5 Red Hat Update Agent

Downloading and Updating with Red Hat Update Agent

After you start Red Hat Update Agent you will see a screen that displays new packages available for your system. It may take a minute for this screen to appear.

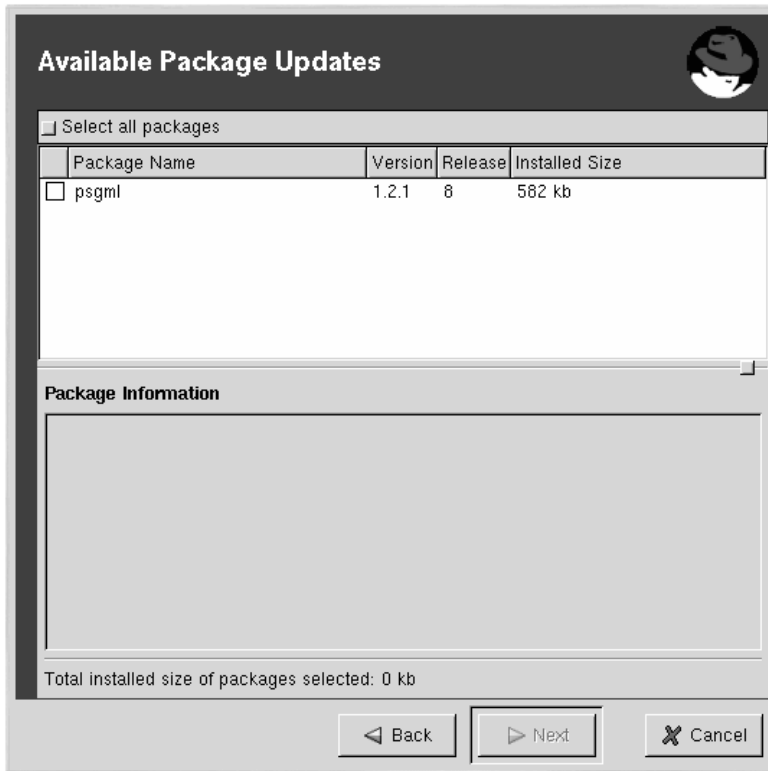
Figure 12–6 Update Agent — New Packages



To download and install new packages:

1. Mark the packages you want to skip, if any, in the **Packages Flagged to be Skipped** dialog box and click on **Next**.
2. On the next screen, **Available Package Updates**, mark the packages you want and click on **Next**.

Figure 12–7 Available Package Updates



Red Hat Update Agent checks for dependencies and then displays a screen showing the progress of the download.

1. Click on **Next** and Red Hat Update Agent installs the packages *if* you selected this option in the Red Hat Update Agent Configuration Tool. If you did not select this option, you will have to use RPM or Gnome-RPM to install your packages. See Section 12.7, *Installing Downloaded Packages* or see the Official Red Hat Linux Customization Guide for information on RPM and Gnome-RPM.

12.5 Red Hat Network Web Interface

You can use the Red Hat Network Web application to manage up to five Red Hat Linux systems simultaneously. The Red Hat Network Web interface runs in a Web browser, unlike the standalone Red Hat Update Agent.

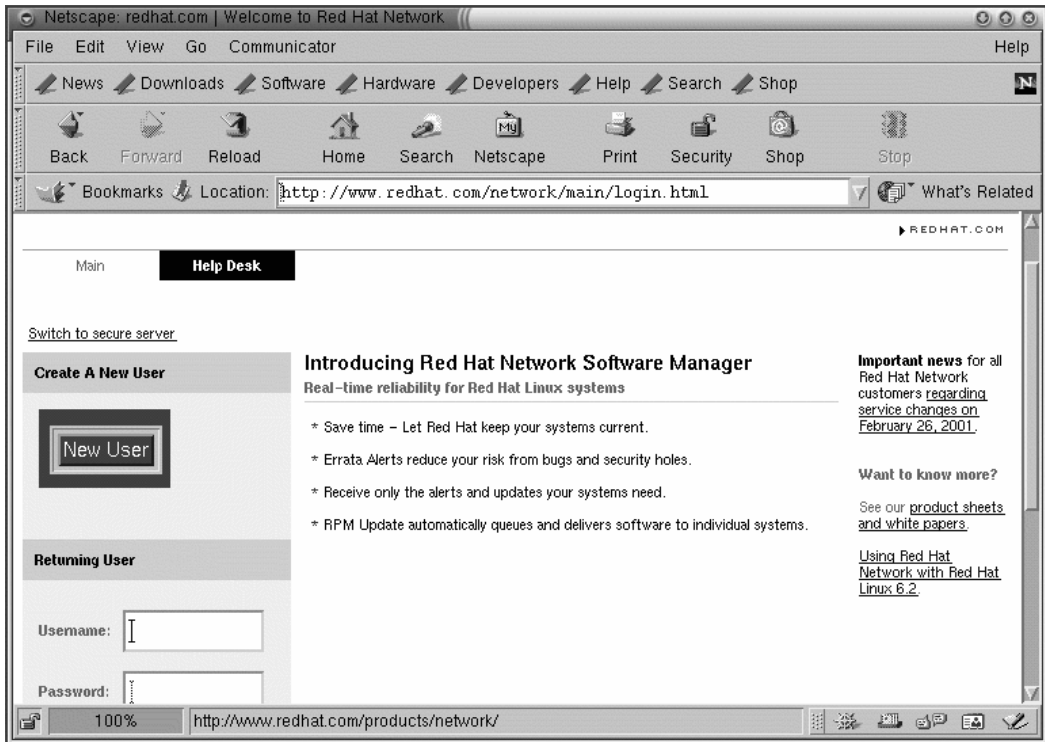
With the Red Hat Network Web application, you can:

- Download a list of selected packages with one mouse click. After browsing the individual systems in your network and choosing the packages you want to install on each one, you can go to your **Download List** page and download all selected packages for your system at one time. This lets you choose your updates without having to wait for each one to download to your system. It also lets you download each package once instead of downloading the same package multiple times for various systems.
- From the **Search Errata** tab, create reports detailing the health and security of your Network Group.
- Quickly determine if a system needs updating and what types of updates are available by viewing the **System Overview** page.
- View only the errata that is relevant to your network.

12.5.1 Logging into the Red Hat Network Web Interface

In a Web browser, go to <http://www.redhat.com/network>.

Figure 12–8 Red Hat Network Web Application

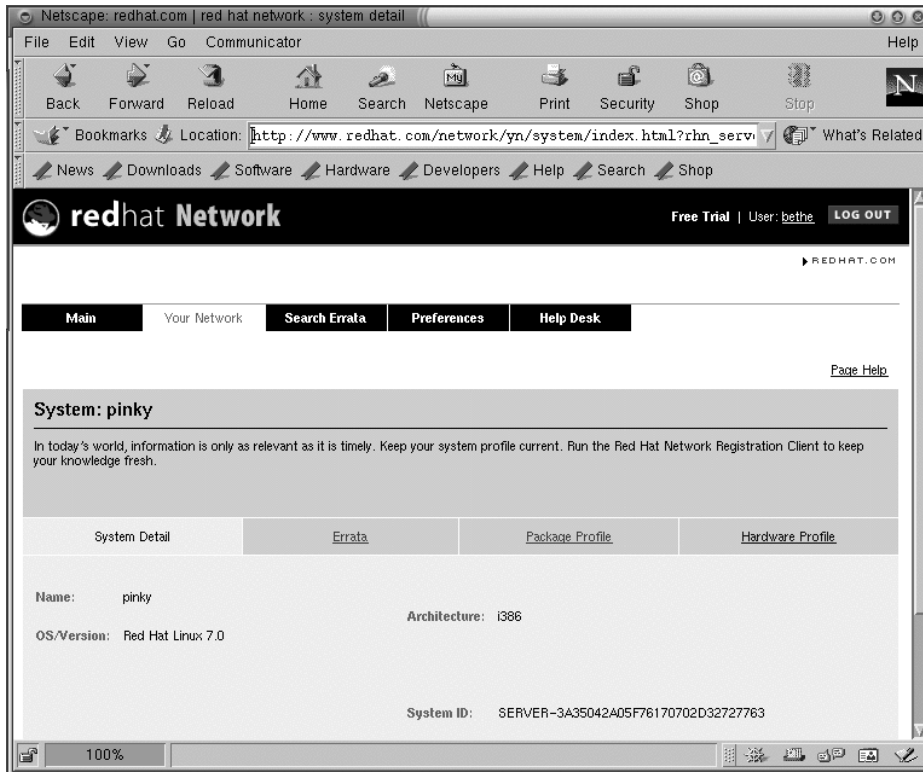


If you have not registered a system yet or you do not have a redhat.com account, create a new account by clicking on the **New User** button on the left of the page. If you registered your system with Red Hat Network through the Red Hat Network Registration Client, enter the same user name and password to log in to the Red Hat Network Web interface.

After creating a new account or using your existing redhat.com account, enter your user name and password at <http://www.redhat.com/network>. The next screen prompts you to set up a system profile. Click on **Profile Your System** and the **Add System Profile** screen will be displayed. Here, you need to enter information about your system as indicated. After you fill in this information, click on **Download Digital Certificate** to continue.

Continue following instructions and then click on **Finish**. The **Your Network Group** screen will appear. Here, you see all of the computers in your network that are registered with Red Hat Network. Click on a **System Name** to see its current profile.

Figure 12–9 Your System Information



On this same screen, click on **Errata** to see a list of package updates for your system.

Viewing Notifications

After logging into the Red Hat Network Web interface, click on **Main** at the top of the navigation bar. Depending on your preferences, this page displays all security alerts, bug fixes, and package enhancements (errata) for all registered systems in your network group.

Click on **View All** to view the details for the errata related to your network group. You can also view the errata page for your network by clicking on **Your Network** at the top of the navigation bar and then on the **Errata** tab.

12.6 Downloading Updated Packages

If you have not configured your **Retrieval/Installation Settings** in the Red Hat Update Agent Configuration Tool to proactively download and install the most recent Red Hat Linux packages, you can download them through the Red Hat Network Web interface.

From the **Errata** tab, click the errata summary link under the **Errata Report**. This takes you to a list of packages required to address the errata. Select the packages you wish to download. After choosing the packages you want, Red Hat Network Web interface gives you three options:

1. Click the **Download Now** button to immediately download the RPMs.
2. Click the **Download Later** button to add the RPMs to **Your Download List**. RPM packages added to this list can be downloaded by clicking on the **Your Download List** link in the upper right hand corner of your screen (this link will not appear if you do not have any packages in **Your Download List**). From **Your Download List** page, you can download, store, or delete packages from your list.
3. Click the **Queue Delivery** button to let Red Hat Network deliver your packages through the Red Hat Update Agent and Red Hat Network Daemon. The next time the daemon connects to Red Hat Network, the queued packages will be downloaded automatically (and installed if preferences set through `up2date-config` has **Do Not Install Packages** checked).

12.7 Installing Downloaded Packages

Once you download packages, whether through the Red Hat Network Web interface or the Red Hat Update Agent, you have to update your system (unless you configured Red Hat Network to automatically install updates). You can update at a shell prompt or with a GUI from your GNOME or KDE desktop. Updating at a shell prompt is the easier method.

To update downloaded packages at a shell prompt:

1. At a shell prompt, type `cd /var/spool/up2date`.
2. Type `rpm -Fvh *.rpm`.

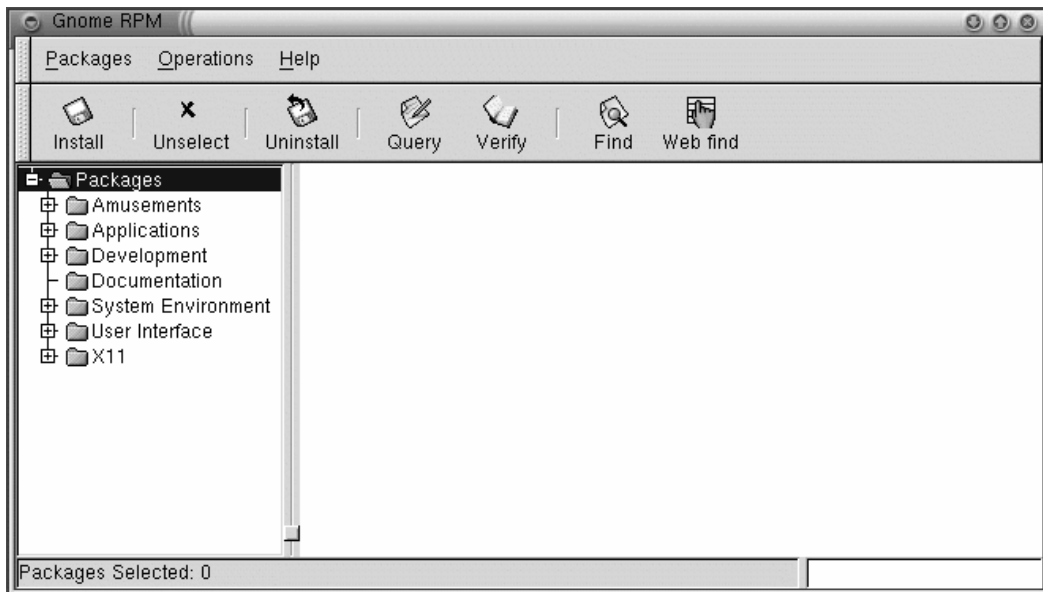
That's it. Downloaded packages are sent to the `/var/spool/up2date` directory. The `cd /var/spool/up2date` command puts you in that directory. The `rpm -Fvh *.rpm` command tells your system everything it needs to know to update all downloaded packages residing in that directory.

If you download RPMs for packages you do not have installed on your system, use **-U** instead of **-F**. This will install the package on your system, rather than update an existing package.

To update using a GUI:

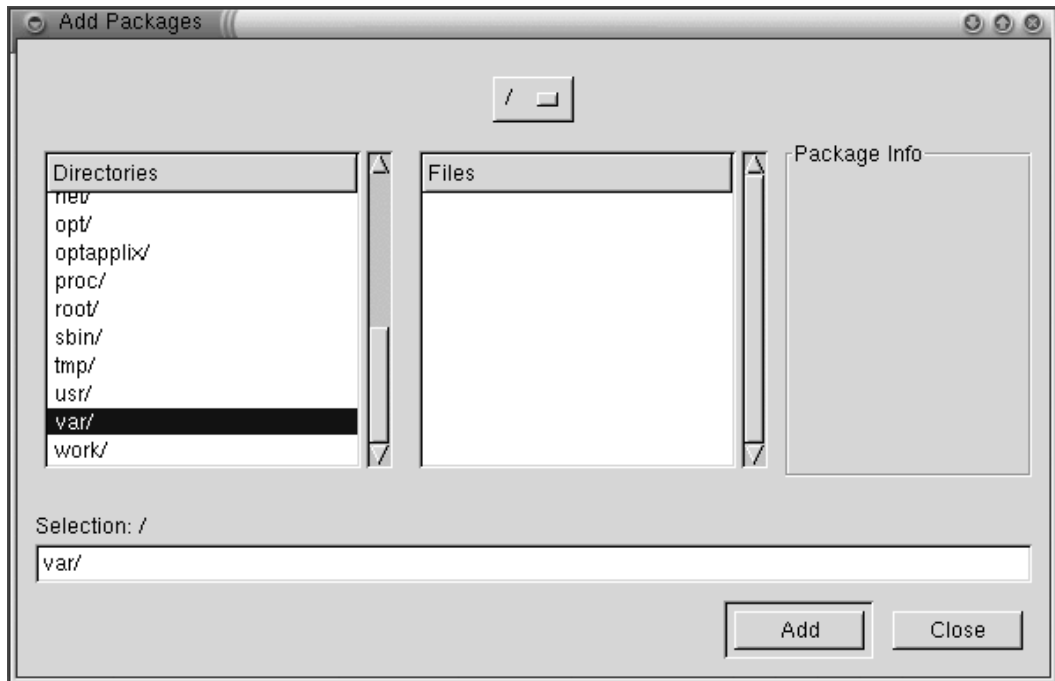
1. Open Gnome-RPM (From a GNOME desktop, go to **Main Menu => System => GnoRPM**; In KDE, go to **Main Menu => Programs => System => GnoRPM**).

Figure 12–10 Gnome-RPM



1. Click on **Install**.
2. In the **Install** dialog box, click on **Add**.
3. In the **Add Packages** dialog box, click on the pulldown menu at the top of the page and select **/** (this indicates your home directory).
4. Under **Directories**, scroll down and double-click on **/var**. This will display a new list of directories in the **Directories** box.

Figure 12–11 Add Package Dialog



1. Under **Directories** again, scroll down and double-click on **/spool**. This, too, will display a new list of directories in the **Directories** box.
2. Once more, under **Directories**, scroll down and double-click on **/up2date**.
3. Go back to the **Install** dialog box, highlight the packages you want, and click on **Upgrade** to upgrade the packages on your system.

12.8 Updating With Errata

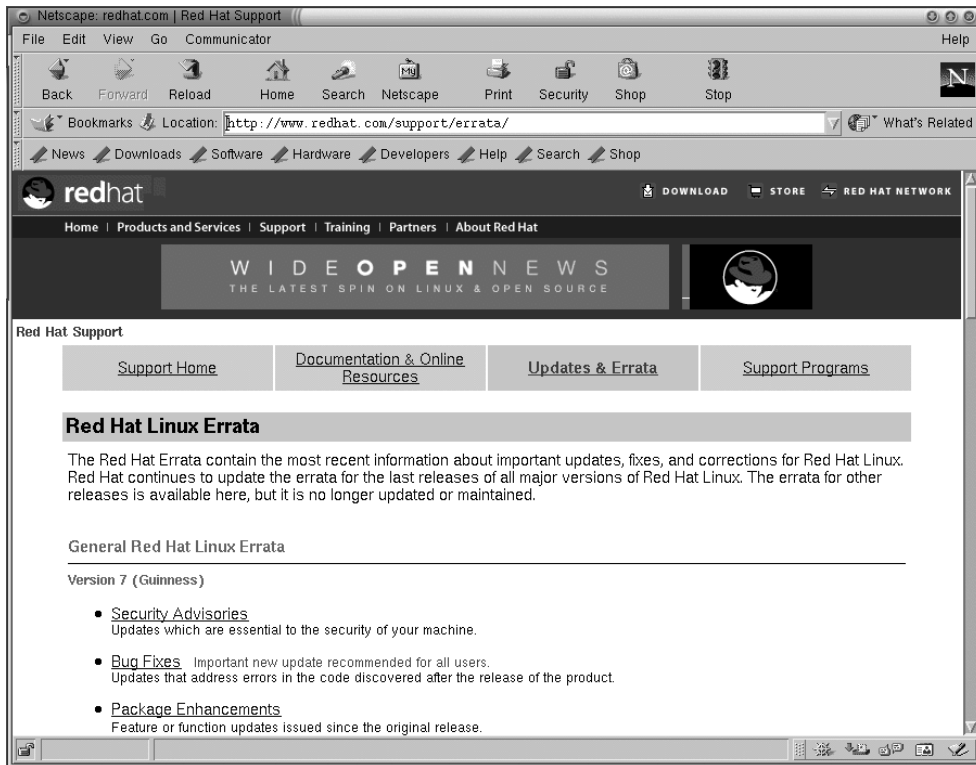
Red Hat Linux errata are package updates, bug fixes, and security patches for Red Hat Linux. They have been tested and approved by Red Hat Linux and can be found at <http://www.redhat.com/errata/>. Red Hat Network updates come from this list, but you can go straight to the errata list and get them yourself.

This updating process is recommended for more experienced Red Hat Linux users.

12.8.1 Locating Errata

The website <http://www.redhat.com/errata/> lists all available errata for Red Hat Linux. You can navigate through this site and click on the links to see what types of RPMs are available. Red Hat tests and approves the RPMs posted on this site. RPMs downloaded from other sites are not guaranteed.

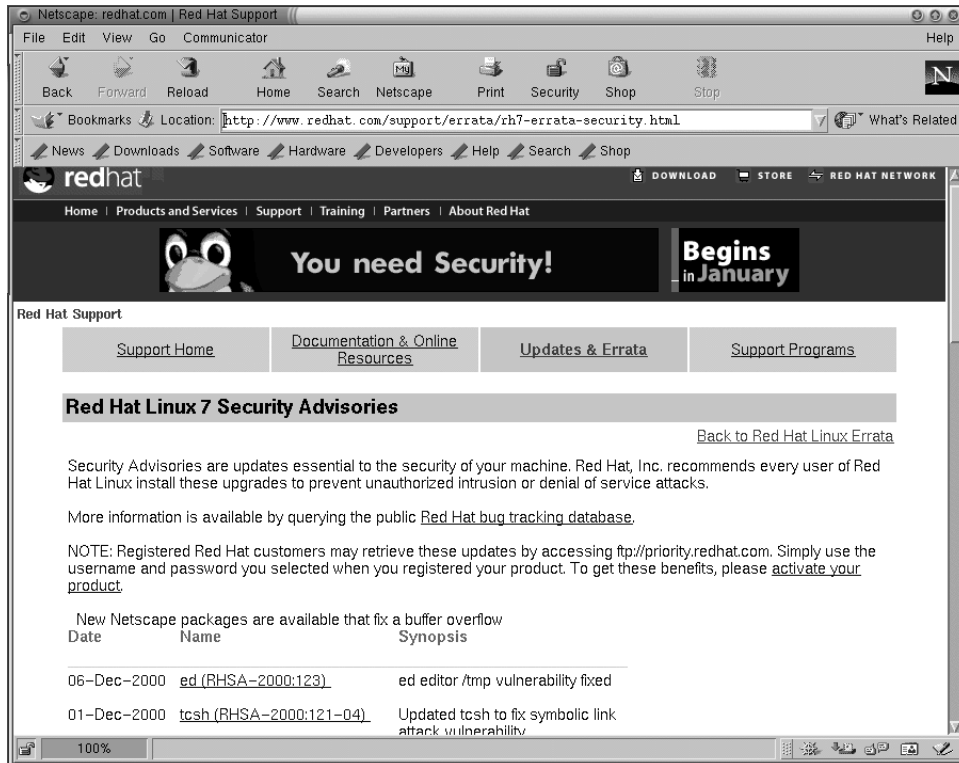
Figure 12–12 Red Hat Errata List



12.9 Downloading and Installing Errata

On the errata website, click on **Package Updates**, **Bug Fixes**, or **Security Patches** under the Red Hat Linux version you want to update. You'll see a list of available RPMs and their descriptions.

Figure 12–13 Available RPMs



To download errata:

1. Click on the package you want to download.
2. Under **RPMs Required**, click on the FTP address containing the file you want.

Clicking on an FTP address will open a dialog box where you determine where the download will be stored. By default, this dialog will display the last directory you were using, or if none, it will default to your home directory. We recommend creating a subdirectory for downloads.

You might have to download the packages from a Red Hat Linux FTP mirror site, if the Red Hat FTP site you select from the errata page is busy. Visit <http://www.redhat.com/mirrors.html> to select a Red Hat Linux mirror site.

1. Determine where you want your RPM to be stored and click on **OK**. The RPM you selected will be downloaded automatically.
2. You can then follow the instructions under **Solution** on the errata page to upgrade RPMs, or upgrade using the RPM application. See the Official Red Hat Linux Customization Guide for more information on RPM.

Part III Q & A

13 Frequently Asked Questions

13.1 Using a Diskette

13.1.1 Q: Working with Diskettes

How do I use a diskette with Red Hat Linux?

13.1.2 A. Using Mtools

If you have an MS-DOS formatted diskette, you can access the files on it using the `mtools` utility.

`Mtools` offers a wide range of options for working with diskettes, including copying, moving, deleting, and formatting. To read more about `mtools`, type `man mtools` at a shell prompt.

For example, to copy a file from an MS-DOS formatted diskette (such as one from a Windows95 system), use the following syntax at a shell prompt:

```
mcopy a:thisfile.txt
thisfile.txt
```

The file will then be copied from the diskette drive (drive A:) to the directory you were in when you issued the `mcopy` command. If you're in your `/home` directory, you'll find `thisfile.txt` there.

If you want to view the contents of an MS-DOS formatted diskette, type `mdir` at the prompt. By default, you'll be shown the contents of the diskette in the A: drive.

To change to a subdirectory on the diskette, type

```
mcd a:subdir
```

In the above command, `subdir` is the name of the subdirectory you want to access.

If you have a diskette that you want to format and use with your Red Hat Linux system, use the **ext2 filesystem**. For more on `ext2`, read on...

13.1.3 A: The ext2 Filesystem

To use a diskette specifically with Red Hat Linux, you'll need to create a Second Extended (`ext2`) filesystem on the disk. The `ext2` filesystem is the filesystem used by Red Hat Linux, and is the most commonly used Linux filesystem type.

Once you've created an `ext2` filesystem on the diskette, you can manipulate its contents in the same ways that you manipulate directories and files on your hard drive.

13.1.4 Creating an ext2 Filesystem on a Diskette

The `mke2fs` command is used to create a Linux ext2 filesystem on a device, which may be a disk partition or a diskette. Put your diskette into the drive and issue the following command at a shell prompt:

```
$ /sbin/mke2fs /dev/fd0
```

On Linux systems, `/dev/fd0` refers to the first diskette drive, usually your A: drive.

The `mke2fs` utility has a number of options. The `-c` option makes the `mke2fs` command check the device for bad blocks before creating the filesystem. The other options are covered in the `mke2fs` man page.

Once you've created an ext2 filesystem on the diskette, it is ready to be used with your Red Hat Linux system.

If You're Using a GUI

Want another quick way to format a floppy for either ext2 or MS-DOS? If you are using KDE, try KDE Floppy Formatter, an easy way to format diskettes. To start the utility, go to **Main Menu K => Utilities => KFloppy**. In GNOME, go to **Main Menu => Programs => Utilities => gfloppy** to start the `gfloppy`.

13.2 Putting Linux Files on a Windows Disk

13.2.1 Q: Putting Linux Files on a Windows Disk

How do I copy files from my Linux machine to a DOS formatted floppy disk so that my Windows machine can read it?

13.2.2 A: Formatting and Mounting Disks for Windows Use

You should format your disk in Windows, then mount it in Linux like this:

Put the floppy in the drive and, as root, type:

```
mount -t vfat /dev/fd0 /mnt/floppy
```

To copy files, use the command:

```
cp [filename] /mnt/floppy
```

To unmount the floppy so you can eject it, type:

```
umount /mnt/floppy
```

13.3 Switching Environments

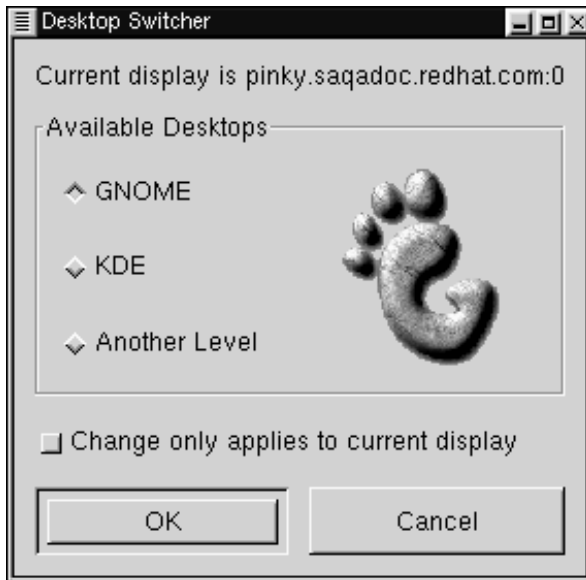
13.3.1 Q: Options for Switching Environments

I know I have both KDE and GNOME on my Red Hat Linux system, but how do I change from one environment to the other?

13.3.2 A: Using Switchdesk

You can use a utility called Switchdesk, which allows you to change to and from GNOME, KDE, and other environments.

Figure 13–1 The Switchdesk Utility from the Shell Prompt



You can use Switchdesk from either the shell prompt or from the login screen.

From a shell prompt, type

```
switchdesk
```

A window will appear (see Figure 13–1, *The Switchdesk Utility from the Shell Prompt*) showing you the choices of environments you can select, under **Available Desktops**. Once you select your new environment, click on **OK**.

To see your changes take effect, you'll have to log out, then log back in.

At the login screen, you can select environments by clicking on **Session** and selecting an environment from the pulldown menu that appears.

Now, just type in your username and password, and log in as usual.

13.4 Shutting Down

13.4.1 Q: Shutting Down

What's the right way to shut down or reboot my system? Are there any shortcuts?

13.4.2 A: Putting Away Files

Any method you choose which allows your Red Hat Linux system to put away all its data files and stop running processes is the right way to shut down. *Never* simply turn off your machine.

Here are two ways you can cleanly shut down your system:

- From your X session: go to **Main Menu** => **Log out** then choose **Logout**, **Halt**, or **Reboot**. You can also choose to save your current setup, which means that the programs which are running when you log out will return when you log back in.
If you select either **Halt** or **Reboot**, you'll be required to enter your login password after you press the **OK** button to verify your selection.
- From the shell prompt: type `shutdown -r now` or `shutdown -h now`. The `-r` means "reboot" and the `-h` means "halt." You will be required to enter your password before these commands are executed.
- From the login screen: go to **System** and choose whether to halt or reboot your system, without a required password.

A Shortcut to Rebooting

One of the fastest ways to reboot your system is to press the [Ctrl],[Alt], and[Del] keys all at the same time, from a virtual console.

A virtual console is a character cell interface, unlike the graphical interface of the X Window System. There are several virtual consoles available to you, but the easiest to remember is probably the first one. You can reach it by pressing [Ctrl]-[Alt]-[F1].

Getting Back

To return to your X session from a virtual console, just press the [Ctrl]-[Alt]-[F7] keys.

To reboot from a virtual console, first move to a virtual console by pressing [Ctrl]-[Alt]-[F1], then press [Ctrl]-[Alt]-[Del] to reboot.

13.5 Error Messages During Installation of RPMs

13.5.1 Q: Errors During Software Installation

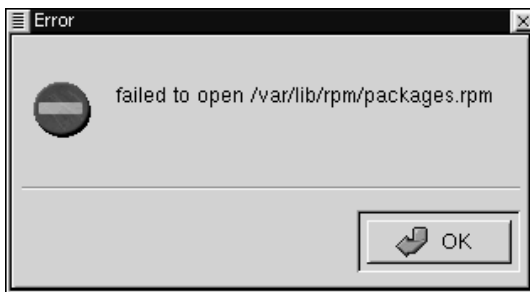
How do I install an RPM from a CD or the Internet? I keep getting an error message when I use Gnome-RPM.

13.5.2 A: File Permissions

If you're getting an error message similar to failed to open `/var/lib/rpm/packages.rpm` (see Figure 13–2, *An RPM Install Error*) it's probably because you do not have the correct permissions set.

When you install software, you're often required to make system-wide changes — changes which only root can make. If you are using your user account, you will not have permission to make such changes by default.

Figure 13–2 An RPM Install Error



For more information about RPM and Gnome-RPM, refer to the chapters in this guide or, for greater depth, refer to the *Official Red Hat Linux Customization Guide* on the Documentation CD (or online, at <http://www.redhat.com/support/manuals>).

13.6 Starting Applications

13.6.1 Q: How Can I Start an Application I Downloaded?

I installed an application I downloaded, and everything seemed to go fine, but I still get "command not found" when I type its name. I think I have the right name, so why won't it start?

13.6.2 A: Starting Applications

If you're trying to start an application from the shell prompt and it isn't working, try adding `./` before the name of the application's executable.

For example, you've downloaded a **setiathome** client and want to try it out. You follow the directions for installing the software. Now you change to the directory in which you know the executable can be found (as shown below).

```
cd setiathome
```

To start the application now, precede the executable with a `./` as shown below:

```
./setiathome
```

Briefly, the reason you need to use the `./` in order to start the application is because the executable wasn't placed in a directory where your shell knew it could be found (such as `/usr/bin`).

In such instances, you often have to go into the directory which holds the executable and start the application from there. That means you'll have to tell your shell where it can find the executable; adding `./` tells bash the executable can be found in the current working directory.

You can customize your settings so that you won't be required to use the `./` each time. See the following for more information on how to accomplish this.

Editing Your PATH

If you want to periodically start programs without having to enter a `./` before the executable, you'll have to edit a file.

You'll have to add the current working directory (signified by the `.`) to the list of directories in your **PATH** environment variable. This will let the shell know that it can start applications in the directory in which you're currently working.



These instructions are intended *only* for user accounts. Avoid modifying files such as root's `.bash_profile`, because of the potential security risks.

Start a text editor, such as `pico`, at a shell prompt. You can open the file called `.bash_profile` by typing the following:

```
pico .bash_profile
```

You'll see a **PATH** statement, similar to the one shown below.

```
PATH=$PATH:$HOME/bin:
```

To the end of this statement, add `./` as shown below

```
PATH=$PATH:$HOME/bin:/usr/lib/./
```

Now, type `[Ctrl]-[x]`; you'll be asked whether you want to save "the modified buffer" (that's what `Pico` calls an updated file); type `[y]` for "yes." Next, you'll see the name the file will be saved as; press the `[Enter]` key.

Now, you should never have to manually add `./` to the beginning of an executable to start an application located in your current working directory.

13.7 Accessing a Windows Partition

13.7.1 Q: How Do I Access My Windows Partition?

I have a dual-boot system with Red Hat Linux and Windows 98. Is there a way to access my Windows partition while I'm running Linux?

13.7.2 A: Two Ways to Access Windows Partitions

You can access another partition on your system, for example, a Windows partition, in two different ways.

First, let's assume that your Windows partition is on your first IDE hard drive, in the first partition (`/dev/hda1`).

At a shell prompt, log in as root (type `su` and then enter the root password).

Create a directory at which the Windows partition will be mounted by typing the following command:

```
mkdir /mnt/vfat
```

Before you can access the partition, you will need to mount it at the directory you just created. As root, type the following command at a shell prompt:

```
mount -t vfat /dev/hda1 /mnt/vfat
```

Another method of mounting a Windows partition is by editing the file `/etc/fstab`.

At a shell prompt, `su` to root, following the above example.

Before you can access the partition, you will need to mount it at the directory you just created. As root, type the following command at a shell prompt:

```
mkdir /mnt/vfat
```

Next, while you're still root, open the `/etc/fstab` in a text editor by typing (for example):

```
pico /etc/fstab
```

The line that probably shows where Windows is mounted is `/dev/hda1` (or similar). Edit this line so it looks like this:

```
/dev/hda1 /mnt/vfat vfat noauto,owner,users 0 0
```

Press `[Ctrl]-[x]` and then press "y" for "yes" when prompted to save the changes. For more information on the `mount` command, read the man page by typing `man mount` at a shell prompt.

To access the partition, type `cd /mnt/vfat`. To navigate through Windows 98's "long filename" directories, surround the directory in quotation marks, as in `ls "Program Files"`.

13.8 Finding Commands Quickly

13.8.1 Q: Locating Previously Used Commands

I was looking at a man page yesterday, but I can't remember the name of the command I was reading about, and I didn't write it down. How do I get the man page back?

13.8.2 A: Searching `.bash_history`

Probably, the command you used is stored in a file called `.bash_history`. By default, this file records the last 500 commands you typed at the shell prompt.

You can glimpse the history of your commands by typing `history` at the shell prompt, but the results will speed by quickly.

Another way to view `.bash_history` is with a pager such as `less`. Type `less .bash_history` at the shell prompt and the results will display one page at a time. To move forward a screen, press the `[Space]`; to move back a screen, press the `[b]` key, and to quit, press `[q]`.

Paging through `.bash_history` to find a command can be tedious. Alternatively, you can search through the file for keywords using `grep`, a powerful search utility.

Let's say you'd been reading the man page the day before, but can't recall its name. To search for the command, type:

```
history | grep man
```

You'll see a list of all the commands you typed which have the word *man* in them.

There are plenty of ways to your command history. For other tips and tricks, see Section 13.10, *Tips on Using Command History*.

13.9 Keep ls Output from Scrolling

13.9.1 Q: When ls Output Scrolls Off the Screen

Whenever I type `ls` I can barely see the output of the directory because it scrolls by too quickly. How can I actually read the output?

13.9.2 A: Piping the Output of ls

To prevent the output of `ls` from scrolling by too quickly, pipe the output to a pager, such as `less` or `more`. The results will be similar to the DOS command `dir somedirectory /p`, because you'll see the output one screen, or "page" at a time.

To read the contents of `/etc` with `less`, type the following command at the shell prompt:

```
ls -al /etc | less
```

To move forward a screen, press [Space]; to move back a screen, press the [b] key; to quit, press [q].

You can achieve the same results with `more`, another pager.

Printing ls Output

You can also print the directory by piping the output to a printer in the same way that you piped the output to your screen. If you've configured a printer, type the following to pipe the output of a command to the printer:

```
ls -al /etc | lpr
```

13.10 Tips on Using Command History

13.10.1 Q: History Tips and Tricks

What are some other ways I can use command history?

13.10.2 A: Using More Command History

If you type **history**, you'll see a numbered list flash by, showing you the previous 500 commands you've used.

You probably don't need to see all of the last 500 commands, so the command **history 20** might be useful. This way, only the previous 20 commands you'd typed will display (you can use any number with this command).

Other Shortcuts

Here are other command history shortcuts which may be useful to you:

- "Bang, bang": Typing **!!** (called "bang bang") executes the last command in the history.
- "Bang *number*": Typing **!*number*** (as in **!302**) will execute the command which is numbered 302 in the history file.
- "Bang *string*": Typing **!*string*** (as in **!rpm**) will execute a command with the most recent matching string from the history file.
- [Up arrow] and [down arrow]: At the shell prompt, you can simply press the up arrow to move back through previous commands in your history list (the down arrow will move you forward through the commands) until you find the command you want. Press [Enter] to execute the command, just as if you had typed it on the command line.

13.11 Forgotten Password

13.11.1 Q: Using Linux Single

Help! I can't remember my root password. How do I log in now?

13.11.2 A: Use Single-User Mode

You can log in with single-user mode and create a new root password.

Reboot your computer. If you are currently set up to log in to X rather than a console, you will need to press [Ctrl]-[X] when prompted. When you see the **boot :** prompt, type **linux single** to enter single-user mode. Some of the filesystems will be mounted, and you will find a **bash#** prompt when you've entered single-user mode (note that this prompt will look somewhat different than the prompt you're accustomed to).

Now, you can change root's password by typing

```
bash# passwd root
```

You'll be asked to re-type the password for verification. Once you're finished, the password will be changed and you can reboot by typing `shutdown -r now` at the prompt; then you can log in to root as before.

13.11.3 Password Maintenance With Linuxconf

I forgot or want to change my user account password.

Open a shell prompt and log in as root (`su -` and root password). Then type `linuxconf` at the prompt. This will open the `linuxconf` tool.

Click on **User accounts** to expand that part of the tree and then click on **Normal**. Under **Normal**, click on **User Accounts** again. A list of user accounts will appear.

Select the user name you need a password for and the **Base information** tab appears. Click on **Passwd** and a **New UNIX password** dialog appears. Enter the new password for this user account. If you forgot your old one, you have to select a new one; Linux will not tell you your old password. Click on **Accept**.

13.12 Using All Available RAM

13.12.1 Q: Using All the Memory

My computer has 128 MB of RAM, but I'm not sure all of it is being used. How can I find out whether all the RAM is being used? Is there a way to get Linux to recognize all my memory, if it isn't already?

13.12.2 A: Make the Kernel Use All Your RAM

Usually, the Linux kernel will recognize all of the RAM on a system; however, there may be circumstances in which not all of the memory is being recognized.

There is more than one way to make certain that all of your machine's memory is being used by the Linux kernel. First, test to see if all of your RAM is being used. If it is not, you can either enter an option at the `boot:` prompt every time you boot your machine or you can edit `/etc/lilo.conf`. If you edit `/etc/lilo.conf`, you will not have to add any options at boot time.

To see if the Linux kernel recognizes all of the RAM on your machine, at a shell prompt, type `cat /proc/meminfo` to find out the current statistics about memory usage on your system. Your output will probably look similar to the following:

```
total:      used:      free:      shared:    buffers:    cached:
Mem:  64655360 63033344 1622016 51159040 1552384 33816576
Swap: 73990144  700416 73289728
MemTotal:      63140 kB
MemFree:       1584 kB
MemShared:     49960 kB
Buffers:       1516 kB
```

```

Cached:      33024 kB
SwapTotal:   72256 kB
SwapFree:    71572 kB

```

Among the categories you'll see will be the total amount of memory the Linux kernel recognizes (in the `Mem:` field). If, for example, you have 128 MB of RAM, and you see the `Mem:` entry reporting only 64 MB or so, then you should instruct the kernel to use all the RAM on your system.

You can pass the instruction to the kernel at the LILO `boot:` prompt. Reboot your system (if you boot directly to X, you will need to press `[Ctrl]-[x]` when prompted). At the `boot:` prompt, type the amount of memory your system should recognize, for example:

```
boot: linux mem=128M
```

Once you press `[Enter]`, you'll boot with your new memory options. If you don't want to type the option each time you boot, you can enter the option in `/etc/lilo.conf`.

su to root and use **PICO** or your favorite text editor to edit `/etc/lilo.conf`. In `/etc/lilo.conf`, you'll see the following:

```

boot=/dev/hda
map=/boot/map
install=/boot/boot.b
prompt
timeout=50
image=/boot/vmlinuz-2.2.5-15
    label=linux
    root=/dev/hda1
    read-only

```

Type in the following text as the first line: **append="mem=128M"**. With the addition, the file should look something like this:

```

append="mem=128M"
boot=/dev/hda
map=/boot/map
install=/boot/boot.b
prompt
timeout=50
image=/boot/vmlinuz-2.2.5-15
    label=linux
    root=/dev/hda1
    read-only

```

You can use the `[Ctrl]-[x]` to quit the file.

You'll be asked if you want to save the file; select `[Y]` to save your changes, `[N]` if you don't want to save the changes, and `[Ctrl]-[C]` to cancel.

Now, type `/sbin/lilo` at the prompt to restart LILO. To exit the root account, type `exit`.

When you reboot, your memory configuration will be passed to the kernel.

13.13 Removing Red Hat Linux

13.13.1 Q: Removing Red Hat Linux

How do I remove Red Hat Linux from my computer?

13.13.2 A. Remove LILO

To remove Red Hat Linux, you'll need to remove the LILO information from your Master Boot Record (MBR).

There are several ways to remove LILO from the MBR. If you are using Linux, you can replace the MBR with an earlier, saved version of the MBR using the following command:

```
/sbin/lilo -u
```

In DOS, NT, ME, and Windows 95, you can use `fdisk` to create a new MBR with the undocumented flag `/mbr`. Windows 98 does not come with `fdisk`. To remove LILO, Windows 98 users will have to reinstall Windows 98. This will *only* rewrite the MBR to boot the primary DOS partition. The command should look like:

```
fdisk /mbr
```

Removing Partitions

If you want to remove Linux from a hard drive, and you attempted to use the default DOS `fdisk`, you will experience the "Partitions exist but they don't exist" problem. The best way to remove non-DOS partitions is with a tool that understands partitions *other than* DOS.

You can do this with your Red Hat Linux installation CD-ROM or from a boot diskette you have created by typing **linux expert** at the `boot:` prompt, such as:

```
boot:linux expert
```

Select the option to install (rather than upgrade). When you get to the partitioning section, choose `fdisk`. In `fdisk`, type **p** to print out your partition numbers; then remove the Linux partitions with the **d** command. When you're satisfied with the changes you've made, you can quit with a **w**, and your changes will be saved to disk. If you've deleted too much, type **q** to quit without changes.

When your partitions have been removed, you can reboot with `[Ctrl]-[Alt]-[Del]` rather than continue with the installation.

13.14 Changing Login from Console to X at Startup

13.14.1 Q: Changing to Graphical Login

How do I change my login from the console to the graphical screen?

13.14.2 A. Edit `/etc/inittab`

Instead of logging in to your system at the console and typing the `startx` command to start the X Window System, you can configure your system so that you can log in directly to X.

You must edit one file, `/etc/inittab`, by changing just one number in the runlevel section. When you're finished, log out and, the next time you log in, you'll have a graphical screen.

Open a shell prompt. If you're in your user account, `su` to root by typing

```
su
Password: yourrootpassword
```

Now, type `pico /etc/inittab` to edit the file with Pico. The file `/etc/inittab` will open. Within the first screen, you'll see a section of the file which looks like this:

```
# Default runlevel. The runlevels used by RHS are:
# 0 - halt (Do NOT set initdefault to this)
# 1 - Single user mode
# 2 - Multiuser, without NFS (The same as 3, if you do not have networking)
# 3 - Full multiuser mode
# 4 - unused
# 5 - X11
# 6 - reboot (Do NOT set initdefault to this)
#
id:3:initdefault:
```

To change from a console to a graphical login, you should change the number in the line `id:3:initdefault:` from a 3 to a 5.

WARNING

Change *only* the number of the default runlevel from 3 to 5.

Your changed line should look like:

```
id:5:initdefault:
```

When you're satisfied with your change, save and exit the file using the [Ctrl]-[x] keys. You'll see a message telling you that the file has been modified, and asking you to confirm your change. Type [y] for yes.

That's it. Your next login will be from the graphical screen.

13.15 Configuring X

13.15.1 Q: Changing Screen Resolution

Everything on my desktop looks tiny. How do I change my screen resolution?

13.15.2 A. Use Xconfigurator

After you have installed Red Hat Linux, you may want to change your screen resolution, so that objects will fit better on your desktop. You can adjust the resolution with Xconfigurator, a tool which allows you to modify your X Window System settings.

To use Xconfigurator, you must log in as root and at a shell prompt, type `Xconfigurator` to start the application. The opening screen will look like Figure 13-3, *The Opening Dialog of XConfigurator*.

Other Ways To Start the Xconfigurator

You can start Xconfigurator in two other ways, both of which give you access to additional configuration tools.

From the menu in GNOME or KDE, go to **System => Text mode tool menu**; or, from a shell prompt, type `setup`. Both methods will produce a menu of items which you can configure, such as X, your sound card, mouse, and other features.

Figure 13–3 The Opening Dialog of XConfigurator

To navigate and make selections, use the [Tab] key. When your selection is highlighted, press the [Enter] key.

Is Your Hardware Supported?

Make certain that your monitor and graphics card are supported for Red Hat Linux. To check, visit the Hardware Compatibility List at <http://www.red-hat.com/hardware>.

To continue, [Tab] until the **Ok** button is highlighted and press [Enter]. Xconfigurator will then probe your system for your video card, and suggest the correct X server to match your system, as in Figure 13–4, *Results of Video Card Probe*. Click the **Ok** button to proceed.

Figure 13–4 Results of Video Card Probe

Next, pick your exact monitor make and model number, as in Figure 13–5, *The Monitor Setup Dialog*. You can often find the make and model number on the front or back of your monitor.

Figure 13–5 The Monitor Setup Dialog



You'll have quite a few monitor choices — the hash mark (#) indicates your position in the list. Use your [up arrow] and [down arrow] keys to move through the list, or use the [Home], [End], [Page Up] and [Page Down] keys. You can also jump to the manufacturer's place on the list by typing in the first letters of the name (such as ViewSonic) on your keyboard.

Monitor Not On the List?

If you don't find your monitor among the listed makes and models, you can specify your monitor's horizontal and vertical sync frequencies by choosing **Custom** in the list. Refer to your monitor's documentation for information about its correct frequency rates. *Be careful!* Don't select a frequency range which exceeds your monitor's capacity, because you could damage or destroy it.

Once you have selected your monitor's make and model, a dialog will inform you that your card will be probed for its correct display settings. Don't worry if your monitor blinks during the process; that's normal.

If You Don't Want to Probe

You don't have to probe your video card. If you choose the **Don't Probe** option, the next dialog will ask you how much memory is on your video card, then you will be able to select your chosen resolution (see Figure 13-7, *Select Video Modes*).

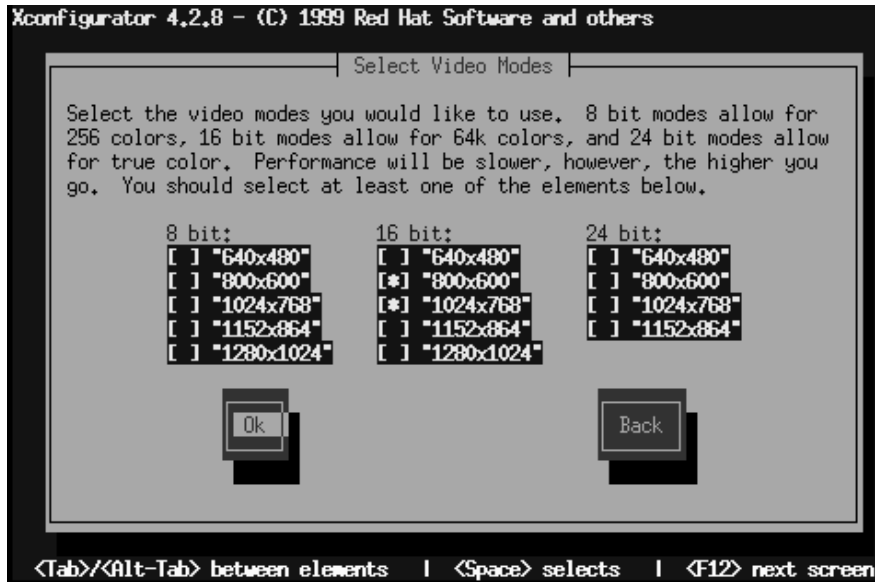
Once the probing has finished, you'll find a dialog similar to Figure 13-6, *Suggested Video Settings*. If you want to accept the default settings, select **Use Default**. If you'd prefer different settings, select the **Let Me Choose** button.

Figure 13-6 Suggested Video Settings



If you want to choose video resolutions different from the default values, you will see the **Select Video Modes** dialog, such as Figure 13-7, *Select Video Modes*.

Figure 13–7 Select Video Modes



You can choose modes ranging from 8-bit to 24-bit, depending on the power of your computer and how many colors you want displayed. In each of the mode columns, you'll find resolution choices listed; using your [Tab] key, position the cursor in the boxes next to your chosen resolution. Select one by pressing [Space].

Choosing More Than One Resolution?

You can select more than one screen resolution — for example, if you prefer **800x600** and **1024x768**, you can adjust your resolution at any time without opening Xconfigurator. To do this, use the [Ctrl]-[Alt]-[+ (plus)] or [Ctrl]-[Alt]-[- (minus)] keys to switch between resolutions.

When you're finished making your selections, press **Ok**.

Next, your video settings will be tested. You will see a graphical screen, with a dialog asking whether your settings appear correct. Following this dialog, another will ask whether you want a graphical login screen; if you answer **Yes**, you will have a graphical screen when you log in to your system. A final dialog will inform you of the location of your video configuration file (`/etc/X11`).

Now, log out, then log in again to your new screen resolution.

Part IV Appendixes

A Glossary

Alpha

A RISC (Reduced Instruction Set Computer) architecture developed by Digital Equipment Corporation.

Applet

A little application, usually a utility or other simple program.

Archive

Transfer files into storage to save space or for organizational purposes.

ATAPI

AT Attachment Packet Interface. ATAPI is the protocol by which CD-ROM drives communicate with a computer system over an IDE interface.

bash

pending

Binary

Although the base two-numbering system used by computers is known as binary, the word often refers to the executable form of a program. Contrast with "source code."

BIOS

Basic Input/Output System. On PC-compatible systems, the BIOS is used to perform all necessary functions to properly initialize the system's hardware when power is first applied. The BIOS also controls the boot process, provides low-level input/output routines (hence its name), and (usually) allows the user to modify details of the system's hardware configuration.

Boot

Short for "bootstrap." The process by which a computer starts running an operating system when power is applied.

Boot Disk

A disk used to start a computer.

Bootstrap

See *Boot*.

CISC

Complex Instruction Set Computer. A design philosophy for computers whereby the processor is designed to execute a relatively large number of different instructions, each taking a different amount of time to execute (depending on the complexity of the instruction). Contrast with RISC.

CMOS

Complementary Metal Oxide Semiconductor. A semiconductor technology used in many integrated circuits. Now often used to describe the low-level hardware that contains a personal computer's BIOS setting, and the computer's hardware clock.

Cylinder

When referring to disk drives, the number of different positions the disk drive's read/write heads can take over the unit's disk platters. When viewed from above the platters, each head position describes an imaginary circle of different diameters on the platter's surface, but when viewed from the side, these circles can be thought of as a series of cylinders nested within each other, hence the term. See also *Geometry*.

Daemon

A daemon is a program that runs, without human intervention, to accomplish a given task. For example, `lpd` is a daemon that controls the flow of print jobs to a printer.

Dependencies

When referring to packages, dependencies are requirements that exist between packages. For example, package `foo` may require files that are installed by package `bar`. In this example, `bar` must be installed, or else `foo` will have unresolved dependencies. RPM will not normally allow packages with unresolved dependencies to be installed.

Device Driver

Software that controls a device that is connected to, or part of, a computer.

Disk Drive

See *Hard Disk*.

Disk Druid

Disk Druid is a component of the Red Hat Linux installation program that is used to partition disk drives during the installation process.

Diskette

A small mass storage device in a removable cartridge, meant to be read/written to, in a compatible drive.

Distribution

An operating system (usually Linux) that has been packaged so as to be easily installed.

Domain Name

A domain name is used to identify computers as belonging to a particular organization. Domain names are hierarchical in nature, with each level in the hierarchy being separated from other levels with a period (pronounced "dot"). For example, Foo Incorporated's Finance department might use the domain name "finance.foo.com."

Dot files

Hidden files. Generally system configuration files that are not used often. File names begin with a dot (.) .

Driver

See *Device Driver*.

Dual Boot

The act of configuring a computer system to boot more than one operating system. The name is something of a misnomer, as it is possible to boot more than the two operating systems the word "dual" implies.

EIDE

Enhanced Integrated Drive Electronics, which is a newer version of the IDE interface standard and another term for a particular implementation for IDE interfaces. EIDE makes larger and faster disk drives possible; most systems sold today use EIDE.

Errata

The Red Hat Errata contain the most recent information about important updates, fixes, and corrections for Red Hat Linux. View and access errata at <http://www.redhat.com/errata>.

Extended Partition

A segment of a disk drive that contains other partitions. See Partition.

FAQ

An abbreviation for Frequently Asked Questions. Linux information is often presented in the form of lists of questions and answers called FAQs.

fdisk

fdisk is a utility program that is used to create, delete or modify partitions on a disk drive.

Filesystem

A filesystem is the method by which information is stored on disk drives. Different operating systems normally use different filesystems, making it difficult to share the contents of a disk drive between two operating systems. However, Linux supports multiple filesystems, making it possible, for example, to read/write a partition dedicated to Windows.

Floppy

A somewhat historical term for a small mass storage device in a removable cartridge, meant to be read/written to in a compatible drive. See *Diskette*.

Formatting

The act of writing a filesystem on a disk drive.

FQDN

Fully Qualified Domain Name. An FQDN is the human-readable name that includes a computer's hostname and associated domain name. For example, given a hostname of "foo," and a domain name of "bar.com," the FQDN would be "foo.bar.com."

FTP

An abbreviation for *File Transfer Protocol*. Also the name of a program that, as the name implies, permits the copying of files from one system on a network to another.

Gateway

In networking terms, refers to a device that connects one or more computers on a network to other networks. The device may be specialized hardware (such as a router), or may be a general-purpose computer system configured to act as a gateway.

Geometry

When referring to disk drives, the physical characteristics of the disk drive's internal organization. Note that a disk drive may report a "logical geometry" that is different from its "physical geometry," normally to get around BIOS-related limitations. See also *Cylinder*, *Head*, and *Sector*.

GID

Group ID. The means by which a user's membership in a group is identified to various parts of Red Hat Linux. GIDs are numeric, although human-readable names are stored in the `/etc/group` file.

Graphical User Interface

Desktop elements (icons and menus) used to operate your system. An alternative to text commands and function keys.

Group

Groups are a way of assigning specific access rights to certain classes of users. For example, all users working on Project X could be added to group `xproj`. System resources (such as disk space) devoted to Project X could then be configured to permit only members of `xproj` full access.

GUI

see *Graphical User Interface*.

Hard Disk

A data storage device. A hard disk contains rotating magnetic media (in the shape of disks) that spin rapidly. Small heads float over the surface of each disk, and are used to write and read data to and from the disk as it rotates.

Head

When referring to disk drives, the number of read/write heads within a disk drive. For each platter in a disk drive, there are normally two heads for each platter, one for each surface, although one surface may go unused. See also *Geometry*.

Hostname

A hostname is a human-readable string of characters used to identify a particular computer system.

I18n

See *Internationalization*.

IDE

Integrated Drive Electronics, which is the name of a standard interface used to connect primarily disk and CD-ROM drives to a computer system. See also *EIDE* and *ATAPI*.

IMAP

Internet Message Access Protocol. A protocol used by certain mail servers.

Intel

Company responsible for producing the microprocessors that most commonly appear in PC-compatible personal computers. These processors include the 80386, 80486, and the Pentium line.

Internationalization

The practice of designing and writing programs that can be easily configured to interact with the user in more than one language. Often referred to as "i18n," due to the number of letters between the starting "i" and the ending "n."

IP Address

IP addresses are the method by which individual computer systems (or from a more strictly accurate interpretation, the network interfaces on those computer systems) are identified on a TCP/IP network. All IP addresses consist of four number blocks, each ranging from 0 to 255, and separated by periods.

ISP

Internet Service Provider.

Kernel

The central core of an operating system upon which the rest of the operating system is based.

Library

When speaking of computers, refers to a collection of routines that perform operations which are commonly required by programs. Libraries may be shared, meaning that the library routines reside in a file separate from the programs that use them. Library routines may also be "statically linked" to a program, meaning that copies of the library routines required by that program are physically added to the program. Such statically linked binaries do not require the existence of any library files in order to execute. Programs linked against shared libraries will not execute unless the required libraries have been installed.

LILO

A commonly-used bootstrap loader for Linux systems based on an Intel-compatible processor.

Linus Torvalds

Created Linux in 1991 while a university student.

Linuxconf

A versatile system configuration program written by Jacques Gelinas. Linuxconf provides a menu-based approach to system configuration via several different user interfaces.

Linux

A full-featured, robust, freely-available operating system originally developed by Linus Torvalds.

Logical Partition

A partition that exists within an extended partition. See also *Partition* and *Extended Partition*.

Man Page

Online manual pages.

Master Boot Record

The master boot record (or MBR) is a section of a disk drive's storage space that is set aside for the purpose of saving information necessary to begin the bootstrap process on a personal computer.

MBR

See *Master Boot Record*.

Memory

When referring to computers, memory (in general) is any hardware that can store data for later retrieval. In this context, memory usually specifically refers to RAM.

MILO

A commonly-used bootstrap loader for Linux systems based on the Alpha processor.

Module

In Linux, a module is a collection of routines that perform a system-level function, and may be dynamically loaded and unloaded from the running kernel as required. Often containing device drivers, modules are tightly bound to the version of the kernel; most modules built from one version of a kernel will not load properly on a system running another kernel version.

Mount

The act of making a filesystem accessible to a system's users.

Mount Point

The directory under which a filesystem is accessible after being mounted.

Name Server

In TCP/IP networking terms, a name server is a computer that can translate a human-readable name (such as "foo.bar.com") into a numeric address (such as "10.0.2.14").

Netiquette

Network etiquette. Conventions of politeness that are recognized on the Internet.

Netmask

A netmask is a set of four number blocks separated by periods. Each number is normally represented as the decimal equivalent of an eight-bit binary number, which means that each number may take any value between 0 (all eight bits cleared) and 255 (all eight bits set). Every IP address consists of two parts (the network address and the host number). The netmask is used to determine the size of these two parts. The positions of the bits that are set in the netmask are considered to represent the space reserved for the network address, while the bits that are cleared are considered to represent the space set aside for the host number.

NFS

Network File System. NFS is a method of making the filesystem on a remote system accessible on the local system. From a user's perspective, an NFS-mounted filesystem is indistinguishable from a filesystem on a directly-attached disk drive.

Operating System

A collection of software that controls various resources of a computer.

Packages

Files that contain software, and written in a particular format that enables the software to be easily installed and removed.

PAM

Pluggable Authentication Modules. PAM is an authentication system that controls access to Red Hat Linux.

Partition

A segment of a disk drive's storage space that can be accessed as if it was a complete disk drive.

Partition Table

The partition table is a section of a disk drive's storage space set aside to define the partitions that exist on that disk drive.

Partition Type

Partitions contain a field that is used to define the type of filesystem the partition is expected to contain. The partition type is actually a number, although many times the partition type is referred to by name. For example, the "Linux Native" partition type is 82. Note that this number is hexadecimal.

PC Card

See *PCMCIA*.

PCMCIA

Personal Computer Memory Card International Association. This organization produced a series of standards that define the physical, electrical and software characteristics of small, credit card-sized devices that can contain memory, modems, network adapters and more. Also known as PC Cards, these devices are mainly used in laptop computers (although some desktop systems can use PCMCIA cards, too).

PCMCIA Support Diskette

A diskette required for Red Hat Linux installations that require the use of a PCMCIA device during the install.

Permissions

The set of identifiers that control access to files. Permissions consist of three fields: user, group, and world. The user field controls access by the user owning the file, while the group field controls access by anyone matching the file's group specification. As the name implies, the world field controls access by everyone else. Each field contains the same set of bits that specify operations that may or may not be performed, such as reading, writing and executing.

PGP

Pretty Good Privacy. **PGP** is an electronic privacy program which helps you ensure privacy by letting you encrypt files and e-mail. The encryption technology employed by **PGP** is very strong. **PGP** was created by Phil Zimmermann, and depends on public key cryptography for its effectiveness. Public key cryptography is a procedure in which users exchange "keys" to send secure documents to each other. For more on **PGP**, go to <http://www.pgp.com>.

PLIP

Parallel Line Internet Protocol. **PLIP** is a protocol that permits TCP/IP communication over a computer's parallel port using a specially-designed cable.

POP

Post Office Protocol. A protocol used by certain mail servers.

POSIX

A somewhat convoluted abbreviation for Portable Operating System Interface. A set of standards that grew out of the UNIX operating system.

PPP

Point-to-Point Protocol. A protocol that permits a dialup connection to an Internet Service Provider.

Process

A process (in somewhat simplistic terms) is one instance of a running program on a Linux system.

PS/2 Mouse

A PS/2 mouse gets its name from the original computer in which this type of mouse was first used — the IBM PS/2. A PS/2 mouse can be easily identified by the small, round connector at the end of its cable.

RAM

An acronym for Random Access Memory. RAM is used to hold programs while they are being executed, and data while it is being processed. RAM is also volatile, meaning that information written to RAM will disappear when the computer's power is turned off.

RAM disk

A virtual drive which uses part of a computer's RAM to store data. A RAM disk provides quick access to information, but unlike written data, that data in a RAM disk is lost when the computer is turned off.

Reboot

To restart the boot process. See also *Boot*.

Red Hat, Incorporated

A software company that produces and markets software, including Red Hat Linux.

Red Hat Network

Also RHN. Internet solution for downloading and installing/updating packages on your system. Consists of Red Hat Update Agent and Red Hat Network Web Application.

Red Hat Update Agent

Part of the Red Hat Network, Red Hat Update Agent is a standalone application used to install/update packages on your system.

RHN

see *Red Hat Network*.

ROM

An abbreviation for Read Only Memory. ROM is used to hold programs and data that must survive when the computer is turned off. Because ROM is non-volatile; data in ROM will remain unchanged the next time the computer is turned back on. As the name implies, data cannot be easily written to ROM; depending on the technology used in the ROM, writing may require special hardware, or may be impossible. A computer's BIOS may be stored in ROM.

Root

The name of the login account given full and complete access to all system resources. Also used to describe the directory named "/" as in, "the root directory."

RPM

RPM Package Manager (yes, it might seem strange, but that IS correct). RPM enables the installation, upgrading and removal of packages (software programs that together form the Red Hat Linux operating system).

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SCSI

An abbreviation for Small Computer System Interface, SCSI is a standard interface for connecting a wide variety of devices to a computer. Although the most popular SCSI devices are disk drives, SCSI tape drives and scanners are also common.

Samba

See *SMB*.

Serial Mouse

A serial mouse is a mouse that is designed to be connected to a computer's serial port. A serial mouse can be easily identified by the rectangular-shaped connector at the end of its cable.

setgid

A system call that can be used to set the GID of a process. Programs can be written using setgid such that they can assume the group ID of any group on the system.

setuid

A system call that can be used to set the UID of a process. Programs can be written using setuid such that they can assume the user ID of any process on the system. This is considered a possible security problem if a program is "setuid root."

Shadow Password

Normally, each user's password is stored, encrypted, in the file `/etc/passwd`. This file must be readable by all users so that certain system functions will operate correctly. However, this means that copies of user's encrypted passwords are easily obtained, making it possible to run an automated password-guessing program against them. Shadow passwords, on the other hand, store the encrypted passwords in a separate highly-protected file, making it much more difficult to crack passwords.

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Shell

Command interpreter.

SLIP

Serial Line Internet Protocol. SLIP is a protocol that permits TCP/IP communication over a serial line (typically over a dial-up modem connection).

SMB

Server Message Block. SMB is the communications protocol used by Windows-based operating systems to support sharing of resources across a network. Also known as Samba.

SMTP

Simple Mail Transfer Protocol. A widely used definition for how to transfer mail over a network.

source code

The human-readable form of instructions that comprise a program. Also known as "sources." Without a program's source code, it is very difficult to modify the program.

SPARC

A RISC (Reduced Instruction Set Computer) architecture developed by Sun Microsystems.

Swap

Also known as "swap space." When a program requires more memory than is physically available in the computer, currently-unused information can be written to a temporary buffer on the hard disk, called swap, thereby freeing memory. Some operating systems support swapping to a specific file, but Linux normally swaps to a dedicated swap partition. A misnomer, the term swap in Linux is used to define demand paging.

System Call

A system call is a routine that accomplishes a system-level function on behalf of a process.

TCP/IP

An abbreviation for Transmission Control Protocol/Internet Protocol, TCP/IP is the networking standard used on the Internet today.

Torvalds, Linus

See *Linus Torvalds*.

UID

User ID. The means by which a user is identified to various parts of Red Hat Linux. UIDs are numeric, although human-readable names are stored in the `/etc/passwd` file.

UNIX

A set of Linux-like operating systems that grew out of an original version written by Ken Thompson and Dennis Ritchie of Bell Telephone Laboratories.

Unmount

The act of revoking access to a filesystem. (Note that the program that unmounts filesystems is called `umount`.)

Update Agent

see *Red Hat Update Agent*.

Virtual Console

Virtual consoles provides multiple "screens" on which a user may log in and run programs. One screen is displayed on the computer's monitor at any given time; a key sequence is used to switch between virtual consoles.

Widget

A standardized on-screen representation of a control that may be manipulated by the user. Scroll bars, buttons, and text boxes are all examples of widgets.

X Window System

Also known as "X," this graphical user interface provides the well-known "windows on a desktop" metaphor common to most computer systems today. Under X, application programs act as clients, accessing the X server, which manages all screen activity. In addition, client applications may be on a different system than the X server, permitting the remote display of the applications graphical user interface.

XFree86

A free implementation of the X Window System.

B A Comparison of Common DOS and Linux Commands

Many Linux commands typed at a shell prompt are similar to the commands you would type in MS-DOS. In fact, some commands are identical.

B.1 DOS and Linux Commands

This appendix provides common commands used at the MS-DOS prompt in Windows 9x and their counterparts in Linux. Basic examples of how the command are used at the Linux shell prompt are also provided. Note that these commands usually have a number of options. To learn more about each command, read its associated man page (for example, type **man ls** at the shell prompt to read about the `ls` command).

Table B–1 Similar Commands

Command's Purpose	MS-DOS	Linux	Basic Linux Example
Copies files	<code>copy</code>	<code>cp</code>	<code>cp thisfile.txt /home/thisdi- rectory</code>
Moves files	<code>move</code>	<code>mv</code>	<code>mv thisfile.txt /home/thisdi- rectory</code>
Lists files	<code>dir</code>	<code>ls</code>	<code>ls</code>
Clears screen	<code>cls</code>	<code>clear</code>	<code>clear</code>
Closes prompt window	<code>exit</code>	<code>exit</code>	<code>exit</code>
Displays or sets date	<code>date</code>	<code>date</code>	<code>date</code>
Deletes files	<code>del</code>	<code>rm</code>	<code>rm thisfile.txt</code>
"Echoes" output on the screen	<code>echo</code>	<code>echo</code>	<code>echo this message</code>
Edits files with simple text editor	<code>edit</code>	<code>pico</code> ¹	<code>pico thisfile.txt</code>

¹ Pico is a simple text editor; other editors you can use in place of Pico include Emacs and vi.

Command's Purpose	MS-DOS	Linux	Basic Linux Example
Compares the contents of files	<code>fc</code>	<code>diff</code>	<code>diff file1 file2</code>
Finds a string of text in a file	<code>find</code>	<code>grep</code>	<code>grep this word or phrase thisfile.txt</code>
Formats a diskette	<code>format a:</code> (if diskette is in A:)	<code>mke2fs</code> (or <code>mformat²</code>)	<code>/sbin/mke2fs /dev/fd0 (/dev/fd0 is the Linux equivalent of A:)</code>
Displays command help	<code>command /?</code>	<code>man³</code>	<code>man command</code>
Creates a directory	<code>mkdir</code>	<code>mkdir</code>	<code>mkdir directory</code>
View a file	<code>more</code>	<code>less⁴</code>	<code>less thisfile.txt</code>
Renames a file	<code>ren</code>	<code>mv</code>	<code>mv thisfile.txt thatfile.txt⁵</code>
Displays your location in the file system	<code>chdir</code>	<code>pwd</code>	<code>pwd</code>
Changes directories with a specified path (absolute path)	<code>cd pathname</code>	<code>cd path-name</code>	<code>cd /directory/directory</code>
Changes directories with a relative path	<code>cd ..</code>	<code>cd ..</code>	<code>cd ..</code>
Displays the time	<code>time</code>	<code>date</code>	<code>date</code>
Shows amount of RAM and use	<code>mem</code>	<code>free</code>	<code>free</code>

² This formats a disk for the DOS filesystem.

³ You can also use `info` for some commands.

⁴ The `more` pager can also be used to page through a file a screen at a time.

⁵ The `mv` command can both move a file and, if you want to rename a file in the same directory, you "move" that file to the same directory with a new name, as in this example.

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