Red Hat Linux 7.3

The Official Red Hat Linux Getting Started Guide

Red Hat Linux 7.3: The Official Red Hat Linux Getting Started Guide
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Table of Contents

Introduction

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

By now, you should have read the *Official Red Hat Linux Installation Guide* and successfully installed Red Hat Linux. This manual is designed to help new and intermediate Linux users navigate and perform common tasks. Keep in mind that Linux looks, feels, and performs differently from other operating systems you may have used. Forget about the conventions of other operating systems and, with an open mind, approach Red Hat Linux as a new, interesting, and versatile alternative.

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 KDE graphical desktop environments (other desktop environments are also available). 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
- Connecting to the Internet
- Upgrading applications
- Pointers to additional resources covering common questions and answers, computer basics, an explanation of Red Hat Linux system directories, and more.

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*.

HTML and PDF versions of the Official Red Hat Linux manuals are available on the Documentation CD and online at http://www.redhat.com/docs/.

Note

Although this manual reflects the most current information possible, you should read the *Red Hat Linux Release Notes* for information that may not have been available prior to our documentation being finalized. They can be found on the Red Hat Linux CD #1 and online at:

```
http://www.redhat.com/docs/manuals/linux
```

1. Changes to This Manual

This manual has been expanded to include new features in Red Hat Linux 7.3 as well as topics requested by our readers. Changes to this manual include:

Email Applications

The *Official Red Hat Linux Getting Started Guide* has been reorganized to include a chapter on using popular email clients including **Evolution**, **KMail**, and **Mozilla Mail**.

Web Browsing

The *Official Red Hat Linux Getting Started Guide* has been reorganized to include a chapter on using various Web browsers including **Mozilla**, **Galeon**, **Nautilus**, and **Konqueror**.

Working with Images

The *Manipulating Images with GIMP* chapter has been renamed *Working with Images*. This chapter now includes information on the latest version of the **GIMP** as well as **GQView** and **Electric Eyes**.

The KDE Desktop Environment

This chapter has been updated for KDE 3.0.

The GNOME Desktop Environment

This chapter revised to include more information on **Nautilus**.

Diskettes, CD-ROMs and CD-Rs

The *Diskettes, CD-ROMs and CD-Rs* chapter has been added with instructions on mounting and using (floppy) diskettes and CD-ROMs as well as a section on using CD-writables (CD-Rs) and CD-rewritables (CD-RWs) with Red Hat Linux.

2. Document Conventions

When you read this manual, you will see that certain words are represented in different fonts, type-faces, sizes, and weights. This highlighting is systematic; different words are represented in the same style to indicate their inclusion in a specific category. The types of words that are represented this way include the following:

`command`

Linux commands (and other operating system commands, when used) are represented this way. This style should indicate to you that you can type the word or phrase on the command line and press [Enter] to invoke a command. Sometimes a command contains words that would be displayed in a different style on their own (such as filenames). In these cases, they are considered to be part of the command, so the entire phrase will be displayed as a command. For example:

Use the `cat testfile` command to view the contents of a file, named `testfile`, in the current working directory.

`filename`

Filenames, directory names, paths, and RPM package names are represented this way. This style should indicate that a particular file or directory exists by that name on your Red Hat Linux system. Examples:

The `.bashrc` file in your home directory contains bash shell definitions and aliases for your own use.

The `/etc/fstab` file contains information about different system devices and filesystems.

Install the `webalizer` RPM if you want to use a Web server log file analysis program.

application

This style should indicate to you that the program named is an end-user application (as opposed to system software). For example:

Use Netscape **Navigator** to browse the Web.

[key]

A key on the keyboard is shown in this style. For example:

To use [Tab] completion, type in a character and then press the [Tab] key. Your terminal will display the list of files in the directory that start with that letter.

[key]-[combination]

A combination of keystrokes is represented in this way. For example:

The [Ctrl]-[Alt]-[Backspace] key combination will exit your graphical session and return you to the graphical login screen or the console.

text found on a GUI interface

A title, word, or phrase found on a GUI interface screen or window will be shown in this style. When you see text shown in this style, it is being used to identify a particular GUI screen or an element on a GUI screen (such as text associated with a checkbox or field). Example:

Select the **Require Password** checkbox if you would like your screensaver to require a password before stopping.

top level of a menu on a GUI screen or window

When you see a word in this style, it indicates that the word is the top level of a pulldown menu. If you click on the word on the GUI screen, the rest of the menu should appear. For example:

Under **Settings** on a GNOME terminal, you will see the following menu items: **Preferences**, **Reset Terminal**, **Reset and Clear**, and **Color selector**.

If you need to type in a sequence of commands from a GUI menu, they will be shown like the following example:

Click on **Programs=>Applications=>Emacs** to start the Emacs text editor.

button on a GUI screen or window

This style indicates that the text will be found on a clickable button on a GUI screen. For example:

Click on the **Back** button to return to the webpage you last viewed.

`computer output`

When you see text in this style, it indicates text displayed by the computer on the command line. You will see responses to commands you typed in, error messages, and interactive prompts for your input during scripts or programs shown this way. For example:

Use the `ls` command to display the contents of a directory:

```
$ ls
Desktop          axhome        logs        paulwesterberg.gif
Mail             backupfiles   mail        reports
```

The output returned in response to the command (in this case, the contents of the directory) is shown in this style.

`prompt`

A prompt, which is a computer's way of signifying that it is ready for you to input something, will be shown in this style. Examples:

```
$
```

```
#
```

```
[stephen@maturin stephen]$
```

```
leopard login:
```

user input

   Text that the user has to type, either on the command line, or into a text box on a GUI screen, is displayed in this style. In the following example, **text** is displayed in this style:

To boot your system into the text based installation program, you will need to type in the **text** command at the boot: prompt.

Additionally, we use several different strategies to draw your attention to certain pieces of information. In order of how critical the information is to your system, these items will be marked as note, tip, important, caution, or a warning. For example:

Note

Remember that Linux is case sensitive. In other words, a rose is not a ROSE is not a rOsE.

Tip

The directory /usr/share/doc contains additional documentation for packages installed on your system.

Important

If you modify the DHCP configuration file, the changes will not take effect until you restart the DHCP daemon.

Caution

Do not perform routine tasks as root — use a regular user account unless you need to use the root account for system administration tasks.

Warning

If you choose not to partition manually, a server installation will remove all existing partitions on all installed hard drives. Do not choose this installation class unless you are sure you have no data you need to save.

3. Copying and Pasting Text With X

Copying and pasting text is easy using your mouse and the X Window System. To copy text, simply click and drag your mouse over the text to highlight it. To paste the text somewhere, click the middle mouse button in the spot where the text should be placed.

4. Using the Mouse

Red Hat Linux is designed to use a three-button mouse. If you have a two-button mouse, you should have selected three-button emulation during the installation process. If you're using three-button emulation, pressing both mouse buttons at the same time equates to pressing the missing third (middle) button.

In this document, if you are instructed to click with the mouse on something, that means click the left mouse button. If you need to use the middle or right mouse button, that will be explicitly stated. (This will be reversed if you've configured your mouse to be used by a left handed person.)

The phrase "drag and drop" may be familiar to you. If you're instructed to drag and drop an item on your GUI desktop, click on something and hold the mouse button down. While continuing to hold down the mouse button, drag the item by moving the mouse to a new location. When you've reached the desired location, release the mouse button to drop the item.

5. We Need Feedback!

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

When submitting a bug report, be sure to mention the manual's identifier:

```
rhl-gsg(EN)-7.3-Print-RHI (2002-07-11T16:05-0400)
```

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.

6. Sign Up for Support

If you have an official edition of Red Hat Linux 7.3, please remember to sign up for the benefits you are entitled to as a Red Hat customer.

You will be entitled to any or all of the following benefits, depending upon the Official Red Hat Linux product you purchased:

- Official Red Hat support — Get help with your installation questions from Red Hat, Inc.'s support team.
- Red Hat Network — Easily update your packages and receive security notices that are customized for your system. Go to http://rhn.redhat.com for more details.
- *Under the Brim: The Official Red Hat E-Newsletter* — 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 a black, red, and white card in your Official Red Hat Linux box.

To read more about technical support for Official Red Hat Linux, refer to the *Getting Technical Support* Appendix in the *Official Red Hat Linux Installation Guide*.

Good luck, and thank you for choosing Red Hat Linux!

The Red Hat Documentation Team

Chapter 1.
Getting Started

The first step to using your Red Hat Linux system is to log in. When you log in, you are basically introducing yourself to the system.

Note

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 user (also known as the superuser), 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 the emphasis throughout this book will be on navigation and productivity using X, it will cover both the graphical and console methods of logging in and starting the X Window System.

1.1. Introductory Terms

When you learn about a new operating system, you also need to learn new terminology. Here are a few basic terms you should learn. You will see these terms often:

- *Shell prompt*: A command line interface (similar to a DOS screen) between the user and the operating system (Figure 1-1). The shell interprets commands entered by the user and passes them on to the operating system.
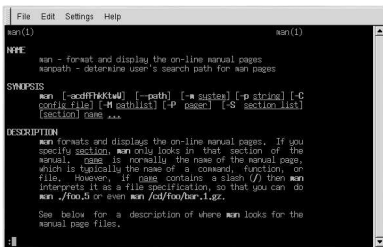
Figure 1-1. Shell Prompt and Command Line

- *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 (Figure 1-2). The panel contains the main menu button and shortcut icons to start commonly used programs. It can be customized by the user.

Figure 1-2. A Panel

- *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. 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 (Figure 1-1). This environment has no icons, limited menus, and requires that you type commands to perform tasks, rather than pointing and clicking with your mouse.
- *RPM*: RPM stands for Red Hat Package manager and is how Red Hat builds and delivers its software files. An RPM is a software package file you can install on your computer.

1.2. 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 and logged into a user account, you can skip ahead to Chapter 2. If you created only the root account, read on to learn how to set up a user account.

If you did not create a user account during installation, you must log in as root. After you create a user account, it is highly recommended that you log in as that user instead of root.

Caution

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 accidentally 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.

1.2.1. Graphical Login

During installation, if you selected graphical as the login type and GNOME as the default desktop, you will see a graphical login screen as shown in Figure 1-3. Again, unless you have chosen to give your machine its own hostname, which is primarily used in a network setting, your machine will proabably be called `localhost`.

Figure 1-3. The GNOME Graphical Login Screen

During installation, if you selected graphical as the login type and KDE as the default desktop, you will see the KDE graphical login screen as shown in Figure 1-4 instead.
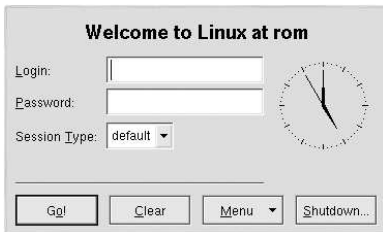
Figure 1-4. The KDE Graphical Login Screen

To log in as root from either graphical login screen, type **root** at the login prompt, press [Enter], type the root password that you chose during installation at the password prompt, and press [Enter]. To log in as a regular user, type your username at the login prompt, type your password that you selected when creating the user at the password prompt, and press [Enter].

Logging in from the graphical login screen automatically starts the X Window System (the graphical interface) for you.

1.2.2. Virtual Console Login

During installation, if you selected text as the login type, you will see a login prompt similar to the following after booting your system:

```
Red Hat Linux release 7.3
Kernel 2.4.18-0.1 on an i686

localhost login:
```

Unless you have chosen to give your machine its own hostname, which is primarily used in a network setting, your machine will proabably be called `localhost.localdomain`.

To log in as root from the console, type **root** at the login prompt, press [Enter], type the root password that you chose during installation at the password prompt, and press [Enter]. To log in as a regular user, type your username at the login prompt, press [Enter], type your password that you selected when creating the user at the password prompt, and press [Enter].

After logging in, you can type the command `startx` to start the X Window System graphical interface.

1.3. Graphical Interface

When you installed Red Hat Linux you had the opportunity to install the GNOME desktop environment, the KDE desktop environment, or both desktops. If you installed both desktops, you were given the opportunity to choose a default desktop. Once you start the **X Window System**, you will find a graphical interface known as a desktop similar to Figure 1-5 in GNOME or Figure 1-6 in KDE.

Figure 1-5. A GNOME Desktop
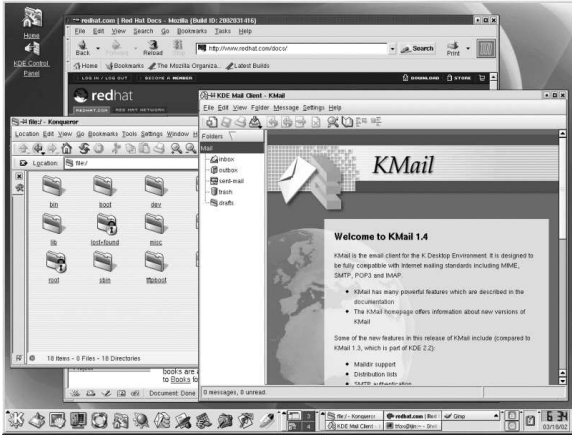
Figure 1-6. A KDE Desktop

If you want to log in to your Red Hat Linux system with a different desktop, select it from the pulldown menu on the graphical login screen, and then log in to the system. The desktop that you selected will appear.

For more information about GNOME and KDE, refer to Chapter 2 and Chapter 3.

1.4. Opening a Terminal Window (Shell Prompt)

Both GNOME and KDE offer quick launch buttons on their panels to open a terminal window, also referred to as a *shell prompt*. While this manual focuses on performing task using the graphical interface and graphical tools, it is sometime useful and faster to perform tasks from a shell prompt. Refer to Chapter 11 for more details.

On the GNOME panel, the button that launches a shell prompt looks like .

You can also open a shell prompt in GNOME by selecting **GNOME Main Menu => Programs => System => GNOME Terminal**.

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

You can also open a shell prompt in KDE by selecting **KDE Main Menu => System => Shell**.

To exit a terminal window, click the **X** button on the upper right corner of the window, type `exit` at the prompt, or type [Ctrl]-[D] at the prompt.

1.5. Creating a User Account

When you installed Red Hat Linux you were given the opportunity to create one or more user accounts. If you did not create at least one (not including the root account) you should do so now. You should avoid working in the root account unless you absolutely have to.

There are two ways to create new and/or additional user accounts: using the **Red Hat User Manager** or from a shell prompt.

To create a user account graphically:

1. In GNOME, click the **Start Here** icon on the panel at the bottom of your desktop. In the new window that opens, click the **System Settings** icon, and then click the **User Manager** icon. You can also select **GNOME Main Menu => Programs => System => User Manager**.

   In KDE, select **KDE Main Menu => System => User Manager**.

2. If you are not logged in as root, you will be prompted for your root password.

3. The window shown in Figure 1-7 will appear. Click on **New User**.
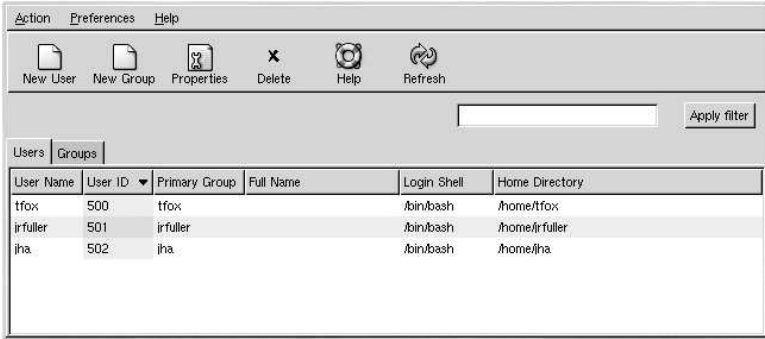
Figure 1-7. The User Configuration Tool

4. In the **New User** dialog box, enter a username (this can be an abbreviation or nickname), the full name of the user for whom this account is being created, and a password (which you will enter a second time for verification). The name of this user's home directory and the name of the login shell should appear by default. For most users, you can accept the defaults for the other configuration options. Refer to the *Official Red Hat Linux Customization Guide* for details about the additional options.

5. Click **OK**. The new user will appear in the user list, and the user account creation is complete.

To create a user account from a shell prompt:

1. Open a shell prompt.

2. If you are not logged in as root, type the command `su -` and enter the root password.

3. Type `useradd` followed by a space and the username for the new account you are creating at the command line (for example, `useradd carole`). Press [Enter]. Often, usernames are variations on the user's name, such as jsmith for John Smith. User account names can be anything from the user's name, initials, or birthday to something more creative.

4. Type `passwd` followed by a space and the username again (for example, `passwd carole`).

5. At the `New password:` prompt enter a password for the new user and press [Enter].

6. At the `Retype new password:` prompt, enter the same password to confirm your selection.

⭐**Important**

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. You can use both uppercase 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!rPl8nE` for `airplane`.

1.6. Documentation Resources

If you have the Official Red Hat Linux boxed set, remember to take a look through the Red Hat Linux 7.3 Documentation CD. All of the Official Red Hat Linux manuals are on this CD. Once you have logged in to your Red Hat Linux user account, inserting the Documentation CD in the CD-ROM drive should automatically open the file manager (**Nautilus** on the GNOME desktop or **Konqueror** on the KDE desktop). If the file manager does not open automatically after a minute or so, refer to Section 4.2 for details on mounting a CD-ROM.

When the file manager opens, click on the RH-DOCS directory to open it. You can view the Official Red Hat Linux manuals using three methods:

View in PDF format

> The RH-DOCS/pdf-en directory on the Red Hat Linux Documentation CD contains files that end in pdf. To view the PDF versions of the manuals, use the **xpdf** program. Refer to Section 12.5 for details.

View in HTML format from the CD-ROM

> Look under **RH-DOCS** in the file manager tree. Open the index-en.html file in a Web browser (the en language abbreviation might vary for your language). Click on the name of the manual you want to read.

> You can also go to http://www.redhat.com/docs/ and read the documentation online. All of the Red Hat Linux 7.3 manuals are available online in PDF, HTML, and RPM formats on the website.

View in HTML format after installing to your hard drive

> The manuals are also available in **RPM** format. Installing the **RPM** packages copies the HTML versions of the manuals to your hard drive so that you can view them without the CD-ROM or an Internet connection. For more information on using **RPM**, refer to the *Official Red Hat Linux Customization Guide*.

> **GnoRPM** provides a graphical interface for installing **RPM** packages on your computer. To install the **RPM** files for the manuals, insert the Documentation CD in the CD-ROM drive (this prompts the file manager window to open automatically, but you can close or minimize it). For a graphical interface, use **GnoRPM** to install the RPM packages. To start it in GNOME, go to **Main Menu => Programs => System => GnoRPM**. In KDE, go to **Main Menu => System => GnoRPM** to start the program. You can also start it from a shell prompt by typing the su - command, entering the root password when prompted, and typing the command gnorpm. The screen as shown in Figure 1-8 appears.
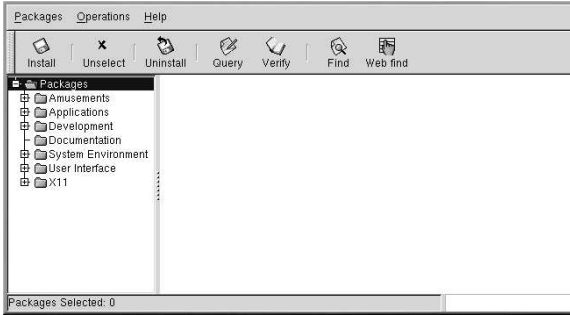
Figure 1-8. GnoRPM

Click on the **Install** button in the upper left corner of this window. Another screen appears, similar to Figure 1-9.
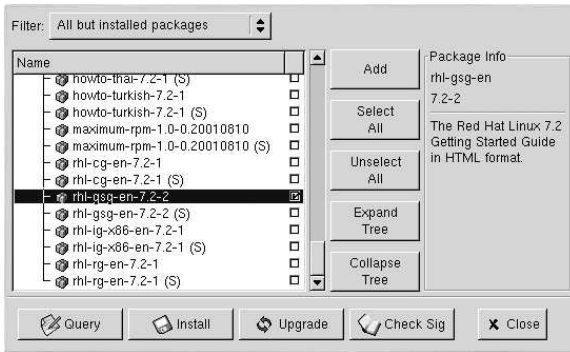
Figure 1-9. GnoRPM Installation Screen

Scroll through the list of documents on the left. Files beginning with `rhl` are Red Hat Linux manuals. The letters `ig`, `gsg`, `cg`, and `rg` follow `rhl`, corresponding to the *Installation*, *Getting Started*, *Customization*, and *Reference* guides respectively.

Select the manual(s) you want to install by clicking on the checkbox to the right of the filename. Then, click on the **Install** button. An installation status screen appears and closes when installation is complete.

The manual(s) you installed now appear on the main menu under **Programs => Documentation => Official Red Hat Linux**.

The manuals can also be installed from a shell prompt. Open a shell prompt, and type the following at the command line:

```
su -
```

Press [Enter]. You will be asked for your root password. Enter the password at the prompt and press [Enter]. You are now logged in as root. To install all four manuals, type the following:

```
rpm -ivh /mnt/cdrom/rhl-*.rpm
```

Press [Enter].

To install only certain manuals, replace `rhl-*.rpm` with the full file name of the manual that you want to install. For example, the file name for the *Official Red Hat Linux Getting Started Guide*

will look something like `rhl-gsg-en-7.2-5.noarch.rpm`, so you would type the following to install the *Official Red Hat Linux Getting Started Guide* on your computer:

```
rpm -ivh /mnt/cdrom/rhl-gsg-en-7.2-5.noarch.rpm
```

Press [Enter]. Type **exit** at the command line and press [Enter]. This takes you out of the root login and back to your user account.

Now go to **Main Menu => Programs => Documentation => Official Red Hat Linux** and select the manual you want to open.

1.7. Logging Out

1.7.1. Graphical Logout

To log out of GNOME, select **GNOME Main Menu Button => Log out** (as shown in Figure 1-10).
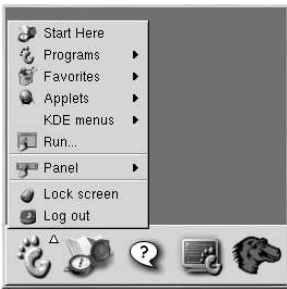
Figure 1-10. GNOME Log Out Selection

When the confirmation dialog appears as shown in Figure 1-11, select the **Logout** option and click the **Yes** button. If you want to save the configuration of your desktop, as well as any programs which are running, check the **Save current setup** option, as well.

Figure 1-11. Logout Confirmation

Similarly, in KDE, you can log out by selecting **KDE Main Menu => Logout**.

If you chose KDE as your default desktop environment during your installation of Red Hat Linux, your logout screen will look like Figure 3-10:
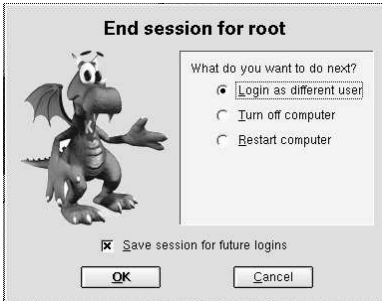
Figure 1-12. KDE Default Logout Confirmation

If you chose GNOME as your default desktop environment during your installation of Red Hat Linux, your logout screen will look like Figure 3-9:

Figure 1-13. KDE Logout Confirmation

At the logout screen, KDE offers you the chance to save your current settings, which will preserve your panel configuration and start any applications that you left open in your session.

If you are working in an application and you have not saved your work when you log out, a dialog will inform you that you will 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 will lose the unsaved data.

By default, the KDE panel also contains a quick launch button to log out; it is located on the right-side of the panel, and looks like

1.7.2. Virtual Console Logout

If you are not using the X Window System, and you logged in at the console, type `exit` or [Ctrl]-[D] to log out of the console session.

1.8. Shutting Down your Computer

Before turning off your computer, it is important to shut down Red Hat Linux. *Never* simply turn off your computer.

1.8.1. Graphical Shutdown

If you are in the X Window System, log out as discussed in Section 1.7. If you are using the GNOME graphical login screen as shown in Figure 1-3, select **Session => Halt...** from the pulldown menu, and click **Yes** to confirm. If you are using the KDE graphical login screen as shown in Figure 1-4, click the **Shutdown...** button, select **Halt**, and click **OK**.

Some computers automatically turn the power off after shutting down Red Hat Linux. If your computer does not, you can turn off the power to your computer after you see the message:

```
Power down.
```

1.8.2. Virtual Console Shutdown

If you are logged in to a console, type the following command to shutdown your computer:

```
halt
```

Some computers automatically turn the power off after shutting down Red Hat Linux. If your computer does not, you can turn off the power to your computer after you see the message:

```
System halted.
```

The GNOME Desktop Environment

2.1. Introducing GNOME

GNOME is one of several graphical desktop environments included with Red Hat Linux. GNOME offers a user-friendly environment where you can easily access your applications and system. Both new and experienced users will be able to take full advantage of their Red Hat Linux system using the GNOME desktop environment.

This chapter covers the fundamentals of the GNOME desktop environment.

If you would like to learn about GNOME in more detail, you will find the latest GNOME-related information at the official GNOME website: http://www.gnome.org.

Tip

If you have both GNOME and KDE installed on your system, you can use applications from the other environment. For example, you can use the KDE email client, **KMail**, while you are working in GNOME. You will find access to the KDE applications in the **Main Menu** (the stylized foot at the bottom of the screen) under **KDE Menus**.

2.2. Finding Help

Additional documentation on the GNOME desktop can be found by clicking on the **Help** tab on the left side of the **Nautilus** window. This brings up the built-in help browser which presents you with a great deal of documentation already installed on your system.

Clicking on the [icon] icon on GNOME Panel displays the *GNOME User's Guide*.

2.3. Using the Desktop

Your first view of GNOME will look something like Figure 2-1.

Figure 2-1. A GNOME Desktop

As stated previously, the GNOME desktop gives you access to the applications and system settings on your computer. You will notice that GNOME offers three main tools to make use of the applications on your system: panel icons, desktop icons, and menu systems.

The long bar across the bottom of the desktop is the *panel*. The panel contains application launchers, status indicators, and small applications.

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.

The menu systems can be found by clicking on the GNOME **Main Menu** button. They can also be found by clicking on the **Start Here** icon and then clicking the **Programs** icon.

The GNOME desktop works in the manner you might expect it to when working with other operating systems. You can drag and drop files and application icons to areas that are easily accessible. You can add new icons for files and applications to the desktop, panel, and file manager. You can change the appearance of most of the tools and applications, as well as changing system settings with provided configuration tools.

2.4. Using the Panel

The GNOME Panel is the bar that stretches across the bottom of the screen and holds icons and small applications which makes using your system easier. The panel also contains the **Main Menu** (the stylized foot icon) which contains menu items for all of your applications. The small applications (called *applets*) allow you to run specific tasks or monitor your system or services, like Red Hat Network, while remaining out of your way.

Figure 2-2. The Panel at the Bottom of the Desktop

2.4.1. Using the Main Menu

You can click on the GNOME **Main Menu** button to expand it into a large set of menus that allows you to access the applications on your system.

From here, you can start most applications included in Red Hat Linux. You will notice that you may access KDE applications under the **KDE Menus** entry (if KDE is installed on your machine). These sub-menus give you access to a full range of applications on your system. From the **Main Menu**, you can also log out, run applications from a command line, and lock your screen, which runs a password protected screen saver (the password being your user password).

2.4.2. Using Applets

Applets are small applications that run on the panel. These usually let you monitor things on your system or the Internet. Some have more specific tasks while others are simply entertaining.

There are a few applets that run on your panel by default. These applets are fairly important and are covered in the following list.

GNOME Pager

The **GNOME Pager** is a simple applet that allows you to see what applications you have open on your desktop(s). GNOME gives you the ability to use multiple desktops so you do not have to have all your running applications crowding one workspace. The **GNOME Pager** will represent each desktop in small squares and show the applications running in each. You may click on one of the squares with your mouse to move to that desktop. You can also use the keyboard shortcut [Shift]-[Meta]-[right-arrow] or [Shift]-[Meta]-[left-arrow] to switch between desktops. (The [Meta] key is usually the [Alt] key.)
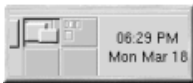
Figure 2-3. GNOME Pager

Taskbar

To the left of the **GNOME Pager** is the **GNOME Taskbar**. The taskbar is an applet which shows you the titles of running applications on any desktop. This is very helpful if you decide to minimize an application as it will seem to disappear from the desktop. Once it disappears, you can bring it back by clicking on its title in the **GNOME Taskbar**.

Figure 2-4. The GNOME Taskbar

Red Hat Network Alert Notification Tool

The **Red Hat Network Alert Notification Tool** provides you with an easy way to make sure your system is up-to-date with current errata and bug fixes from Red Hat. The applet shows you different images that tell you whether your system is up to date or needs an upgrade. If you click on the applet, the **Red Hat Update Agent** will run so you can connect to Red Hat Network. If you are not registered with Red Hat Network, it will launch the registration application. Right-click on the applet icon and select **Help** for details.

Figure 2-5. Red Hat Network Alert Notification Tool

2.4.3. Adding Icons and Applets to the Panel

To make the panel fit your work environment, you may want to add more applets and icons (or launchers).

To add an applet to the panel, click on the GNOME **Main Menu** button and select **Panel => Add to Panel => Applet** and choose from the list of applets. When you select an applet, it will appear on your panel as that is the only place it will run.

To add a launcher (new icon) to the panel, click on the GNOME **Main Menu** button and select **Panel => Add to Panel => Launcher**. This will launch a dialog box which allows you to enter the system command that will launch the application.

Tip

Another quick and easy way to add a launcher to the panel is to click on the **GNOME Main Menu** button and select **Panel** => **Add to Panel** => **Launcher from menu**. Then select an application that appears on the **Main Menu**. This will automatically add a launcher based on the properties of the item in the **Main Menu**.

2.4.4. Configuring the GNOME Panel

You can hide the panel automatically or manually, place it on any edge of your desktop, change its size and color, and change the way it behaves. To alter the default panel settings, click on the GNOME **Main Menu** button and select **Panel => Properties**. Then select **All Properties** to open a general window for adjusting all panel settings, or any one of the specific properties (**Type**, **Hiding Policy**, **Size**, **Background Type**, and so on).

2.5. Using Nautilus

Nautilus is the file manager for the GNOME desktop. **Nautilus** was designed, however, to be much more than a simple file manager. **Nautilus** allows you to configure your GNOME desktop, configure your Red Hat Linux system, play your mp3s, browse your photo collection, access your SMB network, surf the Web, and more all from the same interface. In essence, **Nautilus** becomes a "shell" for your entire desktop experience.

Working in **Nautilus** is efficient and easy, and it provides an alternative to searching through the various sub-menus connected to the **Main Menu**. The following sections explain how to use the **Nautilus** to make your desktop experience easier.

To start **Nautilus** as a file manager, double-click on your home directory icon:

Once you have **Nautilus**, you can navigate through your home directory or the rest of the file system. To return to your home directory, click the **Home** button.

When you are navigating through your file system, you will always be able to see where you are by looking at the frame on the left hand side of **Nautilus** which shows you the current directory.

The main frame contains folders and files which you can drag with your mouse to move and copy them into new locations. If you prefer, you may click on the **Tree** tab on the bottom left to display a hierarchical view of your complete file system which may make moving and copying easier for you.

If you do not want to use the tree view, you can always open another **Nautilus** window by selecting **File => New Window**. Once you have another **Nautilus** window, dragging files to different directories is easy to accomplish. By default, dragging a file from one directory to another will move the file. If you wish to copy the file to another directory, press the [Ctrl] key while dragging and dropping the file.

By default, text-based files and images in your home directory will be seen as *thumbnails*. For text files, this means you will see the beginning of the actual text in the icon. For images you will see a scaled-down version of the image. To turn off this feature, select **Preference => Edit Preferences**. Select **Speed Tradeoffs** from the menu on the left. Select **Never** for the visual enhancements that you want to disable. Disabling these features will increase the speed of **Nautilus**.

2.6. Using the Start Here Icon
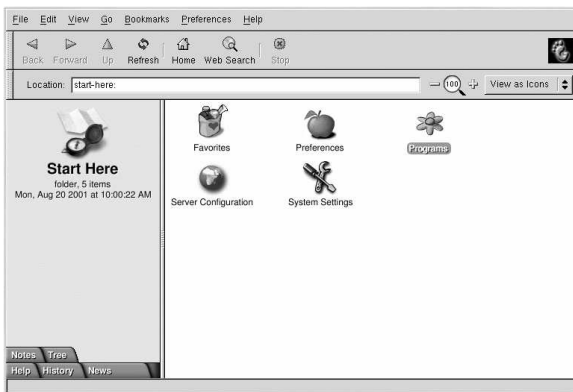
Figure 2-6. The Start Here Window

The **Start Here** screen was designed to hold all of the tools and applications you need to access when using your system. From your favorite applications to system configuration tools, the **Start Here** window provides a central location.

You may access the **Start Here** page at any time by clicking on the desktop icon labeled **Start Here** or by selecting **Start Here** from the **Main Menu**.

The **Start Here** screen includes icons that allow you to access your favorite applications, desktop preferences, **Main Menu** items, server configuration tools, and system settings.

You may want to add your own favorite applications to the **Favorites** section off of the **Start Here** area. To add an application to the **Favorites** section, select the application from the **Main Menu**, click on it with your right mouse button, and select the **Add this to Favorites menu** item from the pop-up menu. You will see an icon for the application in the **Favorites** section immediately.

2.6.1. Customizing GNOME

Within the **Start Here** area you can select the **Preferences** icon to configure your GNOME desktop. Once selected, you will be presented with a wide selection of options for configuring your desktop. Below you will find a list of a few of the configuration options and tools in each area.

Desktop

>   This contains items which are associated with the appearance of your desktop. For example, you may configure your background, panel, and screen saver.

Multimedia

>   In this section you will be able to configure the system sounds associated with various functions. For example, if you would like to have a sound play when you log in to GNOME, you will set that here.

Peripherals

>   If you have any items plugged into your system that GNOME understands or has associated applications, this area will contain configuration tools for them. Keyboard and mice will always be here, but you may also have a tool to help you configure GNOME for a PDA as well.

Sawfish window manager

>   By default, GNOME uses the Sawfish window manager. The window manager determines when, where, and how windows are placed on the screen, as well as how the borders for windows are decorated. These tools allows you to change the behavior and appearance of the Sawfish window manager.

2.6.2. Customizing your System

The **Start Here** page in **Nautilus** contains additional configuration tools that help you with your new Red Hat Linux system and the server applications included.

The **System Settings** icon includes tools that help you set up your system for personal everyday use. Below you will find a list of some of the tools included in **System Settings** and what you can do with them.

Date/Time Properties

>   This tool allows you to set the date and time of your machine. You will be able to set your time zone information as well. Refer to the *Official Red Hat Linux Customization Guide* for details.

Hardware Browser

>   The **Hardware Browser** probes your machine for all available hardware, whether it is internal or external. Each hardware device will bring up different information depending on the device. For example, a hard drive will display partitioning information as well as the amount of available space. Refer to the *Official Red Hat Linux Customization Guide* for details.

Network Configuration

>   The **Network Configuration** tool allows you to set up any type of network connection whether it is a modem, a network card, a wireless card, or broadband connection. Refer to the *Official Red Hat Linux Customization Guide* for details.

Printer Configuration Tool

> The **Printer Configuration** tool allows you to add a new printer to your system. The printer may
> be connected to your machine or available on a network. Refer to Chapter 8 and the *Official Red
> Hat Linux Customization Guide* for details.

As mentioned before, you will also find server configuration tools in the **Start Here** area. These
tools help you configure services and applications you are using on the local machine to serve other
machines. The server configuration tools are found by clicking on the **Server Configuration** icon.
A couple of examples of the tools found in this area are the tools for the Apache Web Server and a
DNS/Bind tool. You must have those server applications installed before these tools appear in this
section. Refer to the *Official Red Hat Linux Customization Guide* for details.

2.7. Logging Out of GNOME

When you have finished working and want to quit GNOME, you are presented with the choice of
simply logging out of GNOME (leaving the system running), restarting the machine, or halting the
system completely.
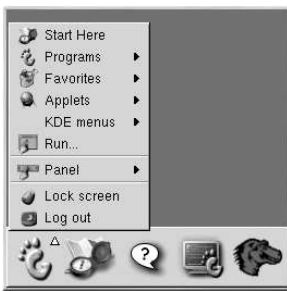
Figure 2-7. The GNOME Log Out Confirmation

To quit GNOME, select the **Log Out** menu item from the **Main Menu**. This will bring up a dialog
which presents you with the options listed above.

The KDE Desktop Environment

3.1. Introducing KDE

KDE is a graphical desktop environment that allows you to access your Red Hat Linux system and applications using your mouse and keyboard.

This chapter covers the fundamental apsects of using the KDE desktop environment including system navigation, working with files and applications, and customizing the desktop to suit your needs.

If you would like to learn more about KDE, visit the official website at http://www.kde.org.

Tip

If you have both KDE and GNOME installed on your system, you can use applications from the other environment. For example, you can use the GNOME email and personal information management suite, **Evolution**, while you are working in KDE. You can access GNOME applications by clicking the **Start Application** button (the 'K' icon at the bottom of the screen), then choosing **Programs** from the menu.

3.2. Setting Up KDE

The first time you log into KDE (refer to Chapter 1 for more information about logging into your Red Hat Linux machine), a setup wizard will appear that allows you to set some initial preferences prior to using the desktop. This wizard guides you through setting up your language and locale settings, choosing how to interact with the KDE interface, configuring your desktop visual effects, and even customizing the look of your desktop. Figure 3-1 shows the welcome screen of the KDE setup wizard. You can elect to skip the setup wizard and run with KDE defaults by clicking **Skip Wizard**.
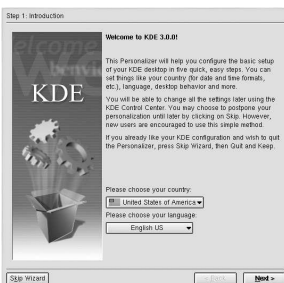
Figure 3-1. The KDE Setup Wizard

3.3. Finding Help

You can access a comprehensive set of documentation about KDE through the KDE **HelpCenter**.
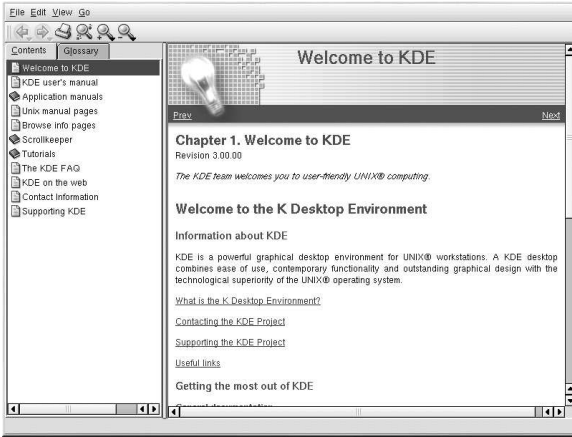
Figure 3-2. The KDE HelpCenter

There are several ways to access the KDE **HelpCenter**:

• From the panel — click on the **Help** icon
• From the **Main Menu** — select **Help**.
• From the desktop — Right-click on the desktop and select the **Help on desktop**.

The opening screen of the KDE **HelpCenter** browser will appear like Figure 3-2. From this main page, you can view help documentation on topics such as using and configuring the desktop, working with the many applications included with KDE, and working with the **Konquerer** file manager.

The **HelpCenter** allows you to perform searches based on keyword entries and Web queries. To do this, click on the search tab and type in a keyword, subject, or significant phrase in the **Keywords** field. Click on **Search** or press [Enter] to begin searching the Internet for your subject.

3.4. Using The Desktop

After setting up KDE using the wizard, your default desktop will look similar to Figure 3-3.
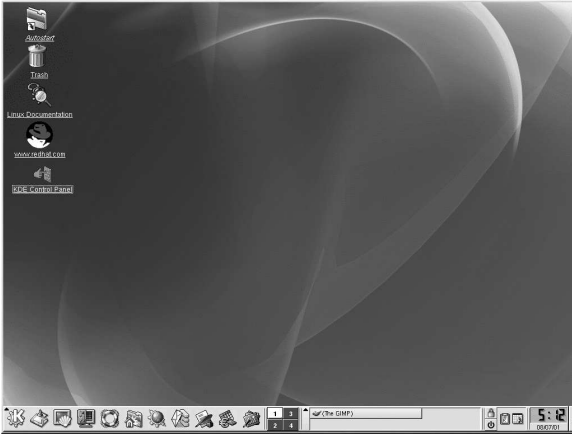
Figure 3-3. A Typical KDE Desktop

The KDE desktop displays application launchers, document windows, file folders, and so on. You can also access the main menu and configure the desktop to suit your needs.

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. The panel taskbar shows your currently running applications.

Icons located on the desktop can be files, folders, device links, or application launchers. Click on an icon to open the associated resource.

The KDE desktop works similarly to other graphical desktop environments. You can drag and drop files and application icons to any location on the desktop. You can also add new icons for all types of applications and resources to the desktop, panel, or file manager. The desktop itself is also highly customizable. You can change the appearance of buttons, window and frame decorations, and backgrounds easily. Configuration tools are also available which allow you to customize the way the desktop behaves at events such as single- and double-clicking mouse buttons and combining (also called *chording*) keystrokes to create time-saving shortcuts.

The default KDE desktop displays icons for the trash can, your home directory, the KDE **Control Panel**, and a link to the Red Hat website. You can access any one of these resources by clicking on the associated icon.

When you right-click on these icons, you will see several options for working with these resources, such as **Delete Rename Move to Trash**, and **Copy**.

You can drag and drop unwanted items such as files you no longer need to the **Trash** icon. Right-click on the trashcan and select **Empty Trash Bin** to delete the items from your system permanently.

3.5. Using The Panel

The panel stretches across the bottom of the desktop. By default, it contains the main menu icon and quick-launch icons for logging out, opening a terminal window, and other common applications and utilities.

Figure 3-4. The Panel

The panel is highly configurable. You can add and remove buttons that launch applications easily. Right-click on the panel and select **Panel => Configuration** to open the panel **Settings**.

Other tabs in **Settings** contain options to further customize your panel. Click on **Help** for more information on these options.

Applications and utilities can be added easily to the panel. To add an application to the panel, right-click on the panel and choose **Panel => Add**. Then select **Button**, **Applet**, **Extension**, or **Special Button**, and make your choice from the corresponding menus.

3.5.1. Using The K Menu

The *K Menu* is the main menu for KDE. Clicking on the **K Menu** icon on the panel displays a large master menu from which you can perform tasks such as launch applications, find files, and configure your desktop. The main menu also contains several submenus that organize applications and tools into several categories, including **Utilities**, **Graphics**, **Internet**, and **Multimedia**.

From the **K Menu**, you can lock your screen, which will display a password-protected screensaver. You can also run applications from a command line as well as logout of your KDE session.

3.5.2. Using Applets

Applets are small applications that run on the panel. There are several types of applets performing functions such as system/network monitoring, launching applications by typing commands in a text box, and even checking the local weather.

There are some applets that run on the panel by default. This section covers them in detail.

3.5.2.1. Working with Multiple Desktops

By default, KDE provides four desktops that you can use to display multiple applications without having to crowd all of them onto one desktop. Each desktop can hold icons, open applications, and have individually customized backgrounds.

For example, while you are writing a message in **KMail** on desktop one, you can have **Konqueror** browsing the Web on desktop two, the **KWord** word processor open on desktop three, and so on.

You can change the number and names of desktops available in KDE by making these adjustments:

1. Right-click on the desktop; you will see a brief menu of actions you can take.

2. Select **Configure Desktop**; the KDE panel configuration tool will open.

3. Click the **Number of Desktops** tab (see Figure 3-5).
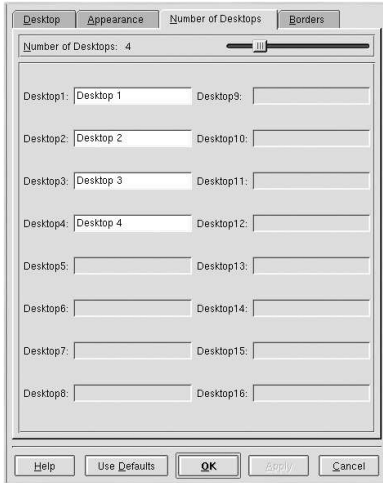
Figure 3-5. The Desktops Tab in the Panel Configuration

You can change the names of your desktops (from **Desktop 1**, **Desktop 2**, etc.) by deleting the default names and typing a new name in each desktop's corresponding text box.

You can also change the number of desktops available to you by adjusting the slider at the top of the **Desktops** tab. 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.

After you make any adjustments to your desktop configuration, click **Apply** to save the changes and close the panel configuration tool.

Buttons for your desktops appear on the panel in the **Desktop Pager**. Simply click on the tiles to move to a different desktop.

Tip

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, and so on.

3.5.2.2. Viewing The Taskbar

The taskbar displays all running applications — both minimized and on the desktop.

Figure 3-6. Applications on the Taskbar

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

Tip

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 have found the task you want to maximize and bring to the front, release both keys.

3.5.3. Adding Icons and Applets to the Panel

To further customize the panel for your particular needs, you can include additional applets and icons (launchers).

To add an applet to the panel, click **K Menu => Configure Panel => Add => Applet**. Choose the applet you want from the menu and it will immediately appear on the panel. You can move the applet by clicking on the applet bar and choosing **Move** from the menu.

To add a new launcher to the panel, click **K Menu => Configure Panel => Add => Button** and choose the application or resource you wish to add to the panel. This will automatically add an icon on the panel.

3.5.4. Configuring the KDE Panel

You can hide the panel automatically or manually, place it on any edge of your desktop, change its size and color, and change the way it behaves. To alter the default panel settings, click **K Menu => Configure Panel => Preferences**. The **Settings** window will appear, allowing you to adjust all panel settings, or any one of the specific properties (**Position**, **Hiding**, **Look & Feel**, **Menus**, and so on).

3.6. Managing Files

Konqueror is the file manager and Web browser for the KDE desktop. **Konqueror** allows you to configure your KDE desktop, configure your Red Hat Linux system, play multimedia files, browse digital images, surf the Web, and more from one interface. This section explains some of the ways **Konqueror** can help you work with and enjoy your Red Hat Linux experience.

To start **Konqueror** for file management, click on your home directory icon .

Konqueror will open up in a window on your desktop, allowing you to navigate through your home directory and throughout your Red Hat Linux file system. After exploring, you can return to your home directory by clicking the **Home** button on the toolbar.
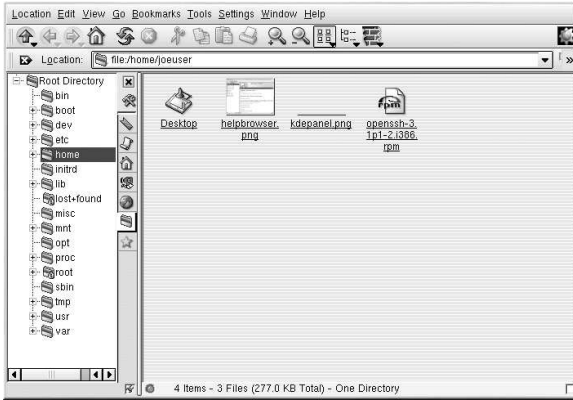
Figure 3-7. The Konqueror File Manager

You can navigate through the file system by clicking on folders within the main window frame or through the hierarchical file system viewer on the navigation panel as shown in Figure 3-7. Files and folders in the main window frame can be moved or copied to another folder or sent to the trash. You can also delete files and folders by right-clicking on the item and choosing **Delete**.

Konqueror can also generate thumbnail icons for text, images, PostScript/PDF files, and Web files. You can even generate preview sounds from mp3 files. From the toolbar choose **View => Preview** and choose the file types for which you would like to see thumbnail icons generated. Thumbnails will be immediately generated for any associated files in the **Konqueror** window.

3.6.1. The Navigation Panel

Another useful feature of **Konqueror** is the *navigation panel*. This panel appears on the left side of the **Konqueror** window by default. The navigation panel makes many of your personalized resources available to you in convenient tabbed icons. Figure 3-8 shows the navigation panel.

Figure 3-8. Working with the Navigation Panel

The navigation panel lets you access your Web bookmarks, browsing history, network resources, file system, and has a built-in media player for playing multimedia files without having to open a separate

application. The navigation panel makes **Konqueror** an effieient solution for users who wish to have fast and easy access to all of their information.

3.7. Customizing KDE

KDE allows you to configure the desktop and your system to suit your needs. The **KDE Control Center** lets you customize the look and behavior of the desktop. The following list explains some of the configuration options in detail.

File Browsing

This section lets you configure the **Konqueror** file manager and customize certain file operations. You can also associate files to applications that you prefer (for example, assigning all MP3 files to open in **XMMS** instead of the default player).

Look & Feel

This sections allows you to customize the visual aspect of your desktop environment. You can customize background images and configure fonts, themes, icons, panel elements, screensavers, and window header decorations. You can also customize mouse and keyboard events which makes working with the desktop as efficient for your needs as possible.

> **Note**
>
> KDE features support for smooth (anti-aliased) fonts. However, not all fonts are smooth by default. In order to have smooth fonts for your entire desktop (whether you are reading text files, webpages, or text in menus and icons) you must choose fonts that are designed to be anti-aliased, such as LucidaTypewriter or Courier).

Personalization

This section allows you to set country and language options to your particular locale. You can also configure accessibility features such as audible and visual cues and keyboard/mouse customization. You can also configure your shell prompt settings via the **Konsole** option. Privacy and encryption settings can be configured via the **Crypto** option.

System

This section is an advanced administration interface. You will need your root password to configure most of these options. This section allows you to configure system boot settings, Linux kernel configuration, printer settings, and install fonts system-wide. It is *strongly* recommended that you leave these settings at their default values unless you understand the consequences of changing them.

Web Browsing

This section allows you to configure the **Konqueror** Web browser. You can configure options such as cache sizes, website cookies, plugins, proxy settings (if available), and enhanced browsing using keyword shortcuts.

3.8. Logging Out of KDE

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

- From the **K Menu**, select **Logout**.

- From the panel, select the **Logout** icon

- From the desktop, right-click on the desktop and select **Logout** from the menu.

If you chose GNOME as your default desktop environment during your installation of Red Hat Linux, your logout screen will look like Figure 3-9:

Figure 3-9. KDE Logout Screen (GNOME default)

If you chose KDE as your default desktop environment during your installation of Red Hat Linux, your logout screen will look like Figure 3-10:
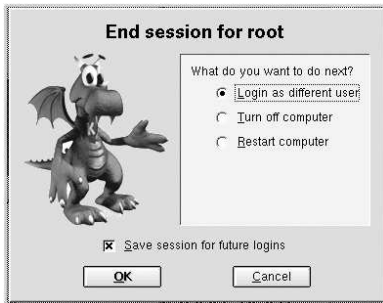
Figure 3-10. KDE Logout Screen (KDE default)

At the logout screen, KDE offers you the chance to save your current settings, which will preserve your panel configuration and start any applications that you left open in your session.

If you are working in an application and you have not saved your work when you log out, a dialog will inform you that you will 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 will lose the unsaved data.

Chapter 4.
Diskettes and CD-ROMs

Using diskettes and CD-ROMs with Red Hat Linux requires some understanding about removable media. This chapter discusses how to read and write files to and from diskettes, how to format diskettes, and how to read and copy data from a CD-ROM. This chapter also covers using CD-writable and CD-rewritable drives.

4.1. Using Diskettes

Diskettes are one of the oldest removable media solutions available for the personal computer (PC). Diskettes are ideal as a portable storage solution used for files that need to be physically moved around. For example, if two PCs are not on the same network, diskettes are a great solution to transfer files from one computer to the other.

4.1.1. Mounting and Unmounting a Diskette

A diskette must be mounted first before it can be used. Insert a diskette into the diskette drive and type `mount /mnt/floppy/` at a shell prompt.

The diskette drive activity light should blink as the diskette's file system is mounted to the `/mnt/floppy` directory.

You can access the contents of the diskette by changing into that directory with the `cd /mnt/floppy/` command.

Alternatively, you can also mount a diskette in the GNOME desktop environment by right-clicking on the desktop and choosing **Disks => Floppy**. This mounts the diskette and adds a desktop icon which you can double-click to explore the diskette contents in **Nautilus**.

Now that the diskette has been mounted it is available to be copied from or written to. You can open, save, and copy files to/from it as you would normally do to your hard drive. You can even explore the diskette's contents in **Nautilus** or **Konqueror**, as shown in Figure 4-1.
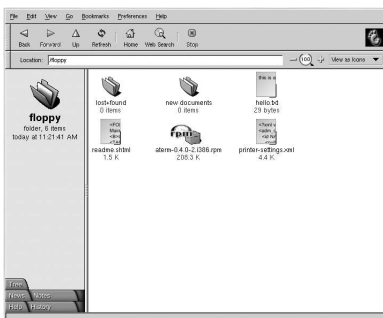
Figure 4-1. Viewing files on a Diskette with Nautilus

When you are done using the diskette, you should unmount it before ejecting it from the drive. To do this, close any applications that may be using files on the diskette or exploring the diskette's contents (like **Nautilus** or **Konqueror**), and at a shell prompt type the following command :

```
umount /mnt/floppy/
```

If you are using GNOME, unmount the diskette by right-clicking on the icon and choosing **Unmount Volume** from the menu.

You can now safely eject the diskette from the drive.

4.1.2. Reading MS-DOS formatted Diskettes

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 Windows system), type the following command at a shell prompt:

```
mcopy a:thisfile.txt
thisfile.txt
```

`thisfile.txt` will be copied from the diskette drive (drive A:) to the directory you were in when you issued the **mcopy** command. If you are in your home directory, you will find `thisfile.txt` located there.

If you want to view the contents of an MS-DOS formatted diskette, type `mdir` at the prompt. You will be shown the contents of the diskette. The directory listing will look familiar to some MS-DOS or Windows users, as it is styled in the MS-DOS `dir` listing format. For example:

```
[joe@localhost joe]$ mdir a:
 Volume in drive A has no label
 Volume Serial Number is 0000-0000
Directory for A:/

FOOBAR    TXT      6004 01-01-1999   1:01
ZZTOP     COM      1533 01-01-1999   1:01
TAXES99   XLS     26469 01-01-1999   1:01
THISFILE  TXT       277 01-01-1999   1:01
COMMAND   COM     93890 01-01-1999   1:01
        5 files            128 173 bytes
                         1 271 827 bytes free
```

To change to a subdirectory on the diskette, type the following command at a shell prompt:

```
 mcd a:subdir
```

In the above command, `subdir` is the name of the subdirectory you want to access.

4.1.3. Putting Linux Files on an MS-DOS Diskette

To copy files from a Linux machine to an MS-DOS formatted diskette so that a Windows machine can read it you should format your disk with an MS-DOS (FAT) filesystem, which can be done with a Windows OS or with **gfloppy** (see Section 4.1.4.1). Then mount it in Linux as described in Section 4.1.1. Copy files using the following command (substituting *filename* with the name of the file you wish to copy):

```
cp filename /mnt/floppy
```

You can then unmount the floppy and eject it from the drive. The new file on the diskette should now be accessible from your Windows machine.

4.1.4. Formatting a Diskette

To use a diskette specifically with Red Hat Linux, you need to format the disk using the ext2 file system. ext2 is one of the file systems supported by Red Hat Linux, and is the default method used for formatting diskettes.

⚠️**Warning**

Formatting a diskette will erase all of its contents. Be sure to backup any files that you need before performing any of the following operations on your diskettes.

Once you have created an ext2 file system on the diskette, you can manipulate its contents in the same ways that you manipulate directories and files on your hard drive.

4.1.4.1. Using gfloppy

In GNOME, go to **Main Menu => Programs => Utilities => gfloppy** to start **gfloppy**. In KDE, go to **Start Application => Programs => Utilities => gfloppy**. From a shell prompt, type `/usr/bin/gfloppy`. As shown in Figure 4-2, the **gfloppy** interface is small and has few options. The default settings are sufficient for most users and needs; however, you can format your diskette with an MS-DOS file system type if you desire. You can also choose the density of your floppy disk (if you are not using the usual high density 3.5" 1.44MB diskette. You can also elect to *quick format* the diskette if it was previously formatted as ext2.
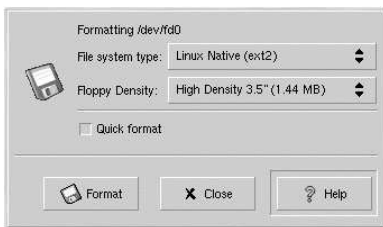
Figure 4-2. gfloppy

Insert a diskette and change the settings to suit your needs; then click **Format**. The status box will appear on top of the main window, showing you the status of formatting and verifying (see Figure 4-3). When it is complete, you can eject the disk and close **gfloppy**.
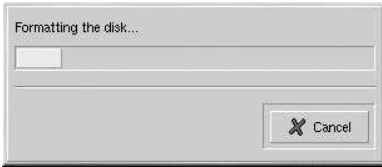
Figure 4-3. gfloppy Status Box

4.1.4.2. Using KDE Floppy Formatter

Another way to format a diskette for either ext2 or MS-DOS is to use **KDE Floppy Formatter**. To start the utility, go to **Start Application => Utilities => KFloppy (Floppy Formatter)**. You will be presented with a graphical interface shown in Figure 4-4.
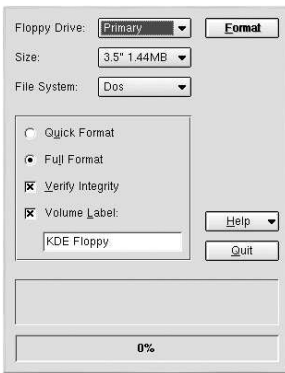
Figure 4-4. KDE Floppy Formatter

Insert a diskette that you wish to format and choose whether you want a **Quick Format** or **Full Format** by choosing the appropriate radio button. To check for bad sectors or blocks on the diskette while formatting, choose **Verify Integrity** in the associated check box.

To begin formatting, click the **Format** button. A window will pop-up asking if you wish to format the diskette. Click **Continue** to dismiss this window and begin formatting. A status bar will appear at the bottom of the window showing the status of the format. After the diskette has been formatted, a final window will appear to inform you of a successful format. Click **OK**, remove the diskette, and click **Quit** to close the application.

4.1.4.3. Using `mke2fs`

The `mke2fs` command is used to create a Linux ext2 file system on a device such as a hard drive partition or (in this case) a floppy diskette. `mke2fs` essentially formats the device and creates an empty, Linux-compatible device which can then be used for storing files and data.

Insert 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. If your computer has more than one floppy disk drive, your primary floppy drive will be `/dev/fd0`, your second `/dev/fd1`, and so on.

The `mke2fs` utility has a number of options. The `-c` option makes the `mke2fs` command check the device for bad blocks before creating the file system. The other options are covered in the `mke2fs` man page.

Once you have created an ext2 file system on the diskette, it is ready to be used with your Red Hat Linux system.

4.2. CD-ROMs

The CD-ROM format is a popular way to deliver typically large software applications and multimedia presentations. Most of the software that can be purchased from retail outlets come in the form of CD-ROMs. This section shows you how to use CD-ROMs on your Red Hat Linux system.

By default, Red Hat Linux automatically detects if a CD-ROM is inserted in the CD-ROM device. If you are using the GNOME desktop environment, the disc will then be mounted and the **Nautilus** file manager will open a window with the drives contents for you to explore. If you use KDE, you will need to mount your CD-ROM manually at a shell prompt before you can explore it through the **Konqueror** file manager or read files from it. Instructions on how to mount CD-ROMs manually are in Section 4.2.2.

4.2.1. Using CD-ROMs with GNOME

By default, GNOME mounts CDs automatically and opens the **Nautilus** file manager for you to explore the contents of the CD. Figure 4-5 shows the contents of a CD-ROM within the **Nautilus** file manager.
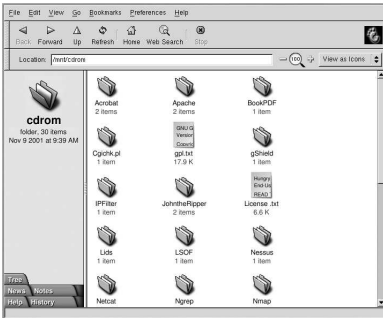
Figure 4-5. Contents of a CD-ROM in Nautilus

A CD desktop icon will also appear, which you can use to unmount and eject your CD-ROM after use. Right-click on the icon to view all of the available choices. For example, to unmount and eject the CD-ROM, choose **Eject** from the menu.

4.2.2. Using CD-ROMs From a Shell Prompt

If you use KDE or have problems with the automatic mounting facilities within GNOME, you can also manually mount and unmount your CD-ROMs from a shell prompt. Insert a CD into your CD-ROM drive, open a shell prompt and type the following command:

```
mount /mnt/cdrom
```

The CD-ROM should now be mounted and available for use with your file manager. If you are using

KDE, you can access your CD-ROM by clicking the ![icon] icon on the desktop and typing `/mnt/cdrom` in the location bar. Figure 4-6 shows the contents of a CD-ROM displayed in the **Konqueror** file manager.

Figure 4-6. Contents of a CD-ROM in Konqueror

After working with your CD, you must unmount it before you eject it from your CD-ROM drive. Close any applications or file managers that are using the CD-ROM and type the following at a shell prompt:

```
umount /mnt/cdrom
```

You can now safely press the eject button on your CD-ROM drive to retrieve your CD.

4.3. CD-Rs and CD-RWs

CD-writable (CD-R) drives have grown in popularity as an inexpensive way to backup and archive several megabytes of data, including applications, personal files, and even multimedia (audio/video and still image) presentations. Red Hat Linux includes several tools for using CD-Rs and CD-rewritable (CD-RW) drives.

4.3.1. Using X-CD-Roast

X-CD-Roast is a graphical application for duplicating and creating (mastering) CD-ROMs. **X-CD-Roast** automates the process of burning CD-Rs and CD-RWs and is highly configurable to many CD mastering or duplicating needs.

To start **X-CD-Roast** in GNOME, choose **Main Menu => Programs => Multimedia => X-CD-Roast**. In KDE, choose **Start Applications => Programs => Multimedia => X-CD-Roast**. At a shell prompt, type `/usr/bin/xcdroast`. **X-CD-Roast** will first scan your device busses and find your CD-R(W) drive. It will then allow you to configure settings for CD-writer, CD-ROM drive, and

more. Figure 4-7 illustrates the **Setup** screen and its configuration options. Note that your CD-R(W) drive brand may be different from the drive shown.
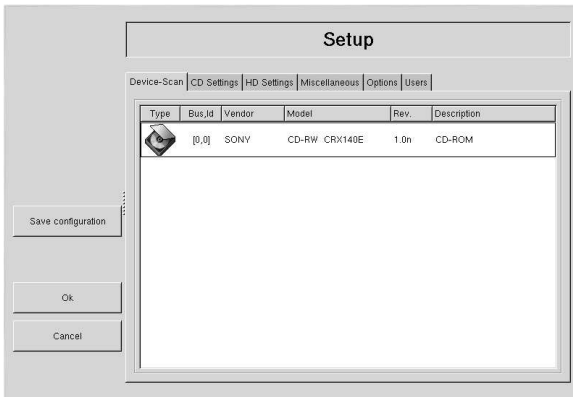
Figure 4-7. X-CD-Roast Setup Screen

Check your CD-R(W) manufacturer documentation to set some of the **CD Settings** options, such as **CD Writer Speed** and **CD Writer FIFO-Buffer Size**. All CD image (`.iso` or `.img`) files need to be stored in a central location accessible to **X-CD-Roast**. You will have to specify a path on your hard drive's file system that has at least 700 Megabytes (MB) of free space available. You can configure the path where you wish to store CD images in the **HD Settings** tab under **Path**.

X-CD-Roast is well-documented within the interface itself, as several of the options have long, descriptive pop-up tips that informs you of the associated function in detail. You can access these *tooltips* by leaving your mouse pointer on a button or drop-down menu for at least two seconds.

4.3.1.1. Using X-CD-Roast to Duplicate CD-ROMs

To duplicate an existing CD-ROM for backup purposes, click the **Duplicate CD** button in the main panel. You can read all of the *tracks* on a CD — all CD-ROM information, including data and audio, is stored on tracks — by clicking **Read CD**. You can set the speed at which you read a CD-ROM as well as find out some information about the CD-ROM track such as its type and size. If you are copying tracks from an audio CD, you can preview each track with **Play Audio-Tracks**. Since **X-CD-Roast** reads all tracks of a CD-ROM by default, you can delete unwanted tracks with **Delete Tracks**.

Finally, to burn your tracks onto CD-R(W) media, choose **Write CD**. Figure 4-8 shows the **Write CD** dialog box, where you can configure the speed at which you read and write the tracks to CD-R as well as whether you wish to copy the CD-ROM *on-the-fly* or create an image file first before burning, which is recommended to prevent write or read errors from occurring during the duplication process. Click the **Write CD** button to start the burning process.
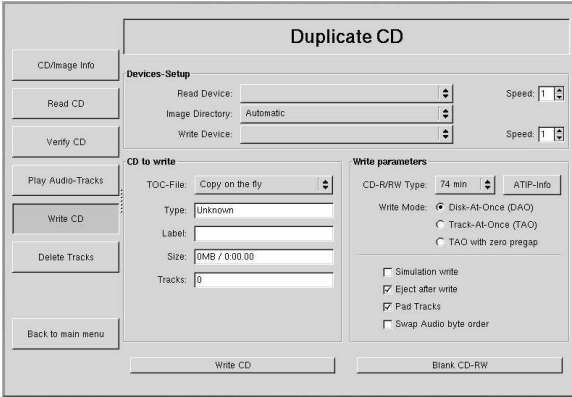
Figure 4-8. Using X-CD-Roast to Duplicate CDs

4.3.1.2. Using X-CD-Roast to Create a CD

It is always recommended to backup personal data and information often in case of hardware failure or file system corruption. **X-CD-Roast** allows you to backup files on your hard drive partition using **Create CD**. This facility allows you to add files and directories into a CD *session* using **Master Tracks**. There are other options within the **Master Tracks** dialog that allows you to configure advanced settings; however, the defaults are set correctly to create data CD-ROMs, so no further configuration is necessary. Figure 4-9 shows a session that is preparing the entire /home directory for backup.
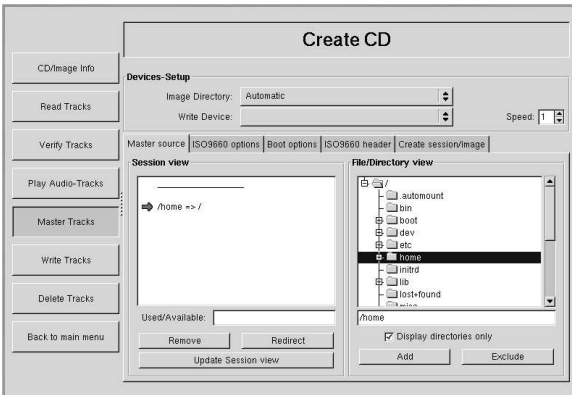
Figure 4-9. Using X-CD-Roast to Back-up Hard Drive Files

Highlight the files and directories that you wish to add to the session and click **Add**. After you have added all the files and directories you want to write to the CD-R(W), click the **Create session/image** tab to create the .img file. You must first click **Calculate size**, then **Master to image file** to create the image.

To write your tracks to the CD-R(W), click **Write Tracks** from the panel on the left. In the **Layout Tracks** tab, highlight the image file you created in the box on the right, and click **Add**. The image will be displayed in the **Tracks to write** box on the left side. Click **Accept track layout**, and click the **Write Tracks** tab to return to the main writing dialog. Click **Write tracks** to write the image to the CD-R(W).

Tip

You can also create and write the image to the CD-R(W) in one step by clicking **Master and write on-the-fly** in the **Create session image** tab. This saves a few steps but can sometimes cause read-write errors. It is recommended that you use the multi-step method instead of on-the-fly methods.

4.3.1.3. Writing ISOs with X-CD-Roast

Large files that end in `.iso` are known as *ISO9660* (or ISO) image files. For example, Red Hat Linux is freely available as ISO images that you can download and write to the CD-R(W). There are other ISO image files available on FTP and websites.

To write an ISO image file to a CD-R(W) with **X-CD-Roast**, move the ISO file to the path specified during setup, then click **Create CD**. In the **Layout tracks** tab, highlight the ISO image file you wish to burn and click **Add**, then **Accept track layout**. This will automatically load the **Write Tracks** tab, where you can click **Write Tracks** to burn the image to the CD-R(W).

4.3.2. Using CD-Rs and CD-RWs with Command Line Tools

If you want to use a shell prompt to write images to CD-R or CD-RWs, there are two utilities available: `mkisofs` and `cdrecord`. These two utilities have several advanced options that are beyond the scope of this guide; however, for basic image creation and writing, these tools save some time over the graphical alternatives such as **X-CD-Roast**.

4.3.2.1. Using `mkisofs`

The `mkisofs` utility creates ISO9660 image files that can be written to a CD-R(RW). The images that `mkisofs` can be made up of all types of files. It is most useful for archival and file backup purposes.

Suppose you wish to backup a directory called `/home/joeuser/`, but exclude the subdirectory `/home/joeuser/junk/` because it contains unnecessary files. You want to create an ISO image called `backup.iso` and write it to CD-R so that you can use it on your Red Hat Linux PC at work and your Windows laptop for trips. This can be done with `mkisofs` by running the following command:

```
mkisofs -o backup.iso -x /home/jouser/junk/ -J -R -A -V -v /home/joeuser/
```

The image will be created in the directory which you were in when you ran the command. Table 4-1 explains each command-line option.

You can now use the ISO image file with either **X-CD-Roast** as described in Section 4.3.1.3, or using `cdrecord`.

Option	Function
Option	Function
`-o`	Specify an output filename of the ISO image
`-J`	Generate Joliet naming records; useful if the CD will be used in Windows environments
`-R`	Generate Rock Ridge (RR) naming records to preserve filename length and casing, especially for UNIX/Linux environments
`-A`	Set an Application ID — a text string that will be written into the volume header of the image that can be useful to determine what applications are on the CD
`-V`	Set a Volume ID — a name that will be assigned to it if the image is burned and the disc is mounted in Solaris and Windows environments
`-v`	Set verbose execution, which is useful for viewing the status of the image as it is being made.
`-x`	Exclude any directory immediately following this option; this option can be repeated (for example, ... *-x /home/joe/trash -x /home/joe/delete* ...)

Table 4-1. `mkisofs` Options

4.3.2.2. Using `cdrecord`

The `cdrecord` utility writes audio, data, and *mixed-mode* (a combination of audio, video, and/or data) CD-ROMs using options to configure several aspects of the write process, including speed, device, and data settings.

To use `cdrecord`, you must first establish the device address of your CD-R(W) device by running the following command as root at a shell prompt:

```
cdrecord -scanbus
```

This command will show all CD-R(W) devices on your computer. Remember the device address of the device you will use to write your CD. The following is an example output from running `cdrecord -scanbus`.

```
Cdrecord 1.8 (i686-pc-linux-gnu) Copyright (C) 1995-2000 Jorg Schilling
Using libscg version 'schily-0.1'
scsibus0:
 0,0,0     0) *
 0,1,0     1) *
 0,2,0     2) *
 0,3,0     3) 'HP      ' 'CD-Writer+ 9200 ' '1.0c' Removable CD-ROM
 0,4,0     4) *
 0,5,0     5) *
 0,6,0     6) *
 0,7,0     7) *
```

To write the backup file image created with `mkisofs` in the previous section, switch to root user and type the following at a shell prompt:

```
cdrecord -v -eject speed=4 dev=0,3,0 backup.iso
```

The command above sets the write speed at 4, the device address as 0,3,0, and sets write output to *verbose* (-v), which is useful for tracking the status of the write process. The `-eject` argument ejects the CD-ROM after the write process is complete. The same command can also be used for burning ISO image files downloaded from the Internet, such as Red Hat Linux ISO images.

You can use `cdrecord` to blank CD-RW discs for reuse by typing the following:

```
cdrecord --dev=0,3,0 --blank=fast
```

4.4. Additional Resources

This chapter covers several applications briefly. Refer to the following resources for more information about the applications in this chapter

4.4.1. Installed Documentation

- `cdrecord` man page — Discusses how to burn data, audio and mixed-mode CD-ROMs. Offers all options and commands in detail, including some example commands for common CD-R(W) burning tasks.
- `/usr/share/doc/cdrecord-<version>` (where `<version>` is the version of `cdrecord` installed on your system) — Several documentation files are included with general usage and licensing information.
- `mkisofs` man page — Comprehensive detail of the utility, including some warnings about creating certain types of ISO images. Offers all options and commands in detail, including some example commands for creating common ISO image files.
- `/usr/share/doc/mkisofs-<version>` (where `<version>` is the version of `mkisofs` installed on your system) — Several documentation files are included with general usage and licensing information.
- `/usr/share/doc/xcdroast-<version>` (where `<version>` is the version of **X-CD-Roast** installed on your system) — Contains useful command-line options and usage information for this graphical CD-R(W) mastering application.
- `/usr/share/doc/dvdrecord-<version>/` (where `<version>` is the version of `dvdrecord` installed on your system) — For users who have DVD-R(+W) devices, this set of documentation helps you get started mastering DVD-ROMs for data backup and multimedia presentation.

4.4.2. Useful Websites

- http://www.xcdroast.org/ — The Official website of the **X-CD-Roast** project.
- http://freshmeat.net/projects/cdrecord/ The `cdrecord` project page on Freshmeat is regularly updated with the newest releases, news, and user commentary.
- http://www.freesoftware.fsf.org/dvdrtools/ — The official website of the `dvdrtools` project, which includes the `dvdrecord` utility for writing DVD-R(+W) discs.

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Chapter 5.

Getting Online

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There are many types of Internet connections including:

- ISDN Connection
- Modem Connection
- xDSL Connection
- Cable Modem Connection

The **Internet Druid** application can be used to configure an Internet connection in Red Hat Linux.

If you would like to configure an Internet connection in Red Hat Linux, you need to use the **Internet Druid** application.

To use **Internet Druid**, you must be running the X Window System and have root privileges. To start the application, use one of the following methods:

- On the GNOME desktop, go to the **Main Menu Button** (on the Panel) => **Programs** => **System** => **Internet Configuration Wizard**.
- On the KDE desktop, go to the **Main Menu Button** (on the Panel) => **System** => **Internet Configuration Wizard**.
- Type the command `internet-druid` at a shell prompt (for example, in an **XTerm** or a **GNOME terminal**).

Your own ISP may have specific connection requirements for their service which differ from the instructions in this chapter. Before connecting, check 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 if you are using a modem.
- Your login name and password for the ISP account.
- A gateway address. Some ISPs may require you to configure a gateway address.
- *DNS entries*: DNS means *Domain Name System*. DNS servers act as a road map for the Internet. When you use the Internet, the DNS tells your machine where to send its message traffic. 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.

ISDN Connection

An ISDN (Integrated Services Digital Network) connection uses high-speed, high-quality digital telecommunication lines as opposed to an analog modem connection. This special phone line must be installed by a phone company. To configure this type of connection, start **Internet Druid**, select **ISDN Connection**, and follow the steps in the wizard.

Modem Connection

A modem connection uses a modem to establish a connection to the Internet. Digital data is modulated into analog signals and sent over phone lines. To configure this type of connection, start **Internet Druid**, select **Modem Connection**, and follow the steps in the wizard.

xDSL Connection

An xDSL (Digital Subscriber Line or Loop) connection uses high-speed transmissions through telephone lines. DSL stands for Digital Subscriber Lines. There are different types of DSL such as ADSL, IDSL, and SDSL. **Internet Druid** uses the term xDSL to mean all types of DSL connections.

Some DSL providers require you to configure your system to obtain an IP address through DHCP with an Ethernet card. To configure this type of connection, start **Internet Druid**, select **Ethernet Connection**, and select DHCP on the **Configure Network Settings** screen. Some DSL providers require you to configure a PPPoE (Point-to-Point Protocol over Ethernet) connection with an Ethernet card. To configure this type of connection, start **Internet Druid**, select **xDSL Connection**, and follow the steps in the wizard. If you must supply a username and password to connect, you are probably using PPPoE. Ask your DSL provider which method you should use.

Cable Modem Connection

A cable modem connection uses the same coaxial cable that your TV cable travels on to transmit data. Most cable Internet providers require you to install an Ethernet card in your computer that connects to the cable modem. Then, the cable modem connects to the coaxial cable. The Ethernet card is usually required to be configured for DHCP. To configure this type of connection, start **Internet Druid**, select **Ethernet Connection**, and select DHCP on the **Configure Network Settings** screen.

For more detailed instructions, refer to the *Network Configuration* chapter in the *Official Red Hat Linux Customization Guide*.

Chapter 6.

Web Browsing

Once you have configured your Internet connection (see Chapter 5), you are ready to get online. Red Hat Linux comes with several open source browsers for you to choose from. This chapter briefly explains how to surf the Web using the following browsers:

• Mozilla

• Nautilus

• Konqueror

• Galeon

6.1. The Mozilla Web Browser

Mozilla functions like any other Web browser. It has the standard navigation toolbars, buttons, and menus.
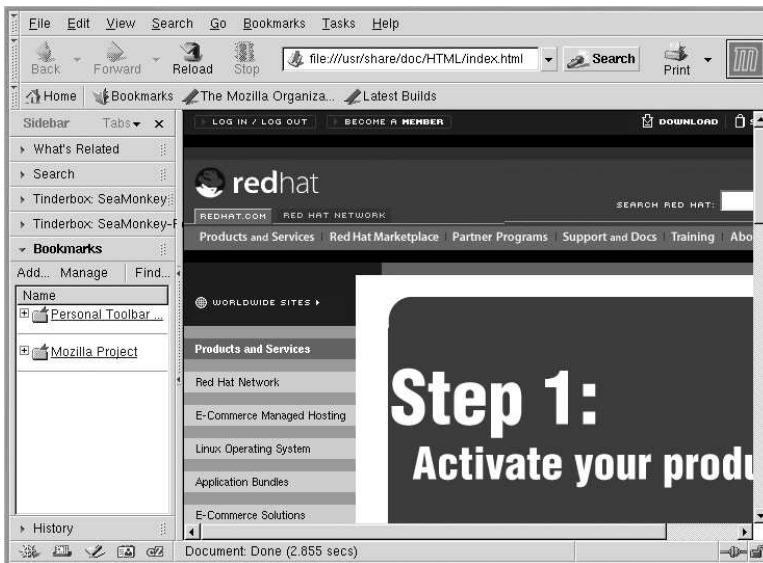
Figure 6-1. Mozilla Main Browser Window

If you have previously been using **Netscape** as your Web browser, or performed an upgrade where **Netscape** was used as your Web browser, you will not see the main **Mozilla** browser as see in Figure 6-1.

Instead, you will see:

Figure 6-2. Mozilla Profile Creation

If you click **Convert Profile**, your prior **Netscape** bookmarks and preferences will be converted to a **Mozilla** profile for you.

When you next launch **Mozilla**, either from the panel or from **Main Menu => Programs => Internet => Mozilla**, you will see that your previous bookmarks are now available in **Mozilla**.

If you click **Manage Profiles**, you will have the opportunity to create one or more profiles, or user accounts, for **Mozilla**.
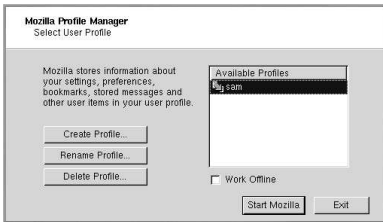
Figure 6-3. Mozilla Profile Manager

Here you can select to create a new profile or you can create a profile based on your user account. This feature helps you stay organized by creating separate user accounts for business use, personal use, multiple accounts, etc.

Clicking **Create Profile** will take you to a information screen explaining what this process really means. To continue, click **Next**.

Next, choose a name to use for this new profile. If you do not enter a name, the profile will be called **Default User**.
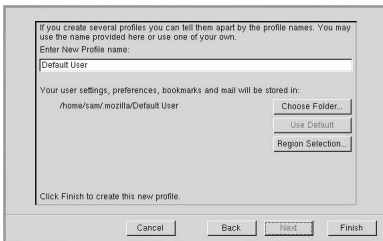
Figure 6-4. Profile Configuration

You can also click **Choose Folder** to select where your **Mozilla** settings and preferences will be stored. By default, these settings are stored in:

```
/home/youraccountname/.mozilla/Default User
```

When you click **Finish**, your new profile will be added.
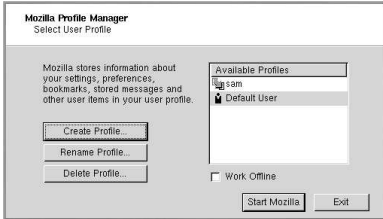
Figure 6-5. Profile Screen With New Profile Added

Now that you have created a user profile, click on **Start Mozilla** to launch the application or click on **Exit** to close it.

To add new profiles or delete existing profiles later on, you will need to run the **Mozilla Profile Manager** again. To launch the **Mozilla Profile Manager**, at the shell prompt type the following command:

```
mozilla --ProfileManager
```

6.1.1. Mozilla Navigator

Once you have configured your user profile, you are ready to use the browser. To access **Mozilla** in GNOME, click on the **Mozilla** launcher on the panel or go to **Main Menu => Programs => Internet => Mozilla**. In KDE, go to **Main Menu => Internet => Mozilla**.
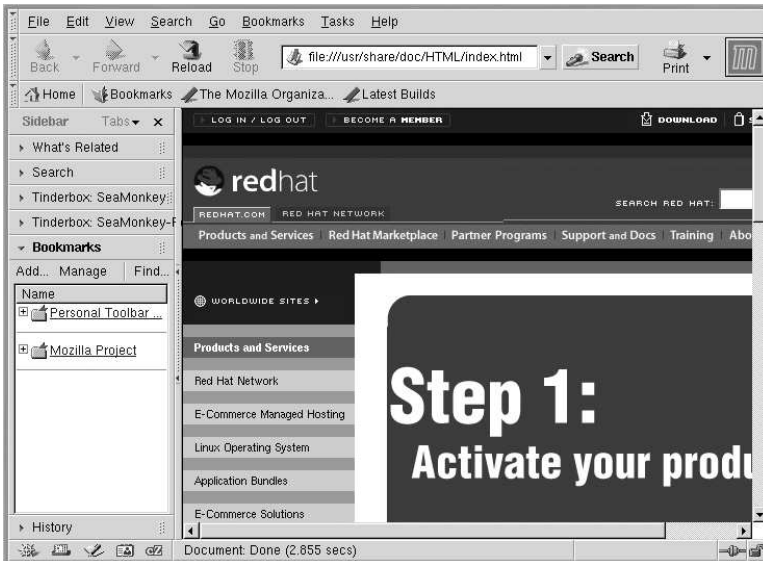
Figure 6-6. Mozilla Main Browser Window

The **Mozilla** screen has all of the standard Web browser functions that other browsers have. There is a main menu at the top of the screen and a navigation bar below it. There is a sidebar on the left

that contains additional options. And in the bottom left corner, there are four small icons : **Navigator**, **Mail**, **Composer**, and **Address Book**.

To browse the Internet, click on **Search** and enter a topic in the search engine that opens, type a website URL in the location bar, click on and create bookmarks, or check the **What's Related** sidebar tab to see pages related to the one you are viewing currently.

For additional information on using **Mozilla**, click on **Help** (on the top menu panel) and then on **Help Content**.

6.1.2. Mozilla Composer

You can use **Mozilla Composer** to create webpages. You do not need to know HTML to use this tool. To open **Composer**, go to **Tasks => Composer** on the **Mozilla** main menu, or click on the **Composer** icon in the lower left part of the screen.

The **Mozilla** help files provide information on creating webpages with **Composer**.

Go to **Help** on the main menu and select **Help Contents**. When the help screen opens, click on the **Contents** tab and expand the **Creating Webpages** menu by clicking on the arrow next to it. A list of topics will appear and clicking on any of these will provide you with information for creating and editing webpages using **Mozilla Composer**.
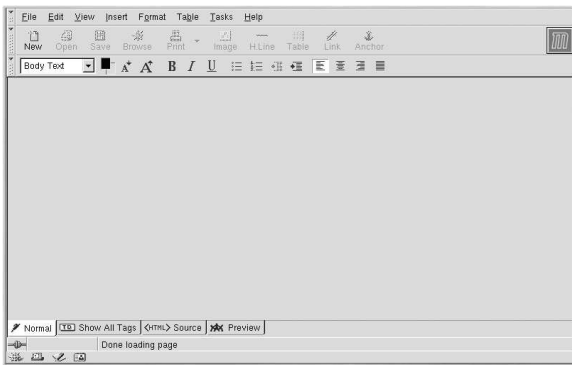
Figure 6-7. Mozilla Composer

6.2. Nautilus as a Web Browser

Nautilus is a core component of the GNOME desktop environment and provides an easy way to view, manage, and customize your files and folders, as well as browse the Web.

Nautilus integrates your access to files, applications, media, Internet-based resources, and the Web, making it easy and fast for you to locate and use all the resources available to you.

If you using **Nautilus**, browsing the Web is merely one mouse click away. Click **Web Search** in the toolbar to launch **Nautilus**'s browser feature.
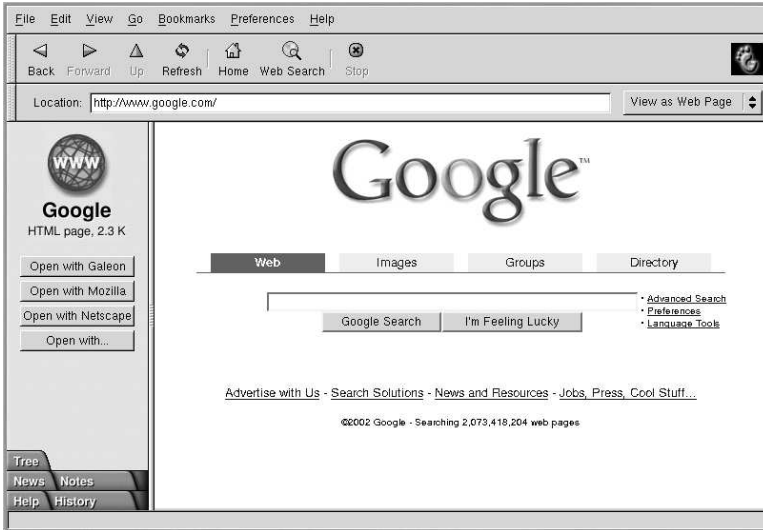
Figure 6-8. Nautilus Web Search

Or, you can use the **Location**: bar to enter path names, URLs, or other types of addresses.

When you are viewing a Web page, **Nautilus** gives you additional browser choices in case you want to use a full-featured Web browser. To select a different browser, click one of the buttons in the sidebar.

For additional information on using **Nautilus**, click on **Help** (on the top menu panel) and select **Nautilus User Manual** or **Nautilus Quick Reference**.

6.3. Web Surfing with Konqueror

Konqueror not only allows you have your file system at your command, browsing local or networked drives, but with component technology used throughout KDE, **Konqueror** is also a full featured, easy to use and comfortable Web browser, which you can use to explore the Internet.

To launch **Konqueror**, go to go to KDE's **Main Menu => Internet => Konqueror Web Browser**.

Figure 6-9. Welcome to Konqueror

When you first launch **Konqueror**, you will be presented with an **Introduction** screen. This screen offers basic instructions for browsing a webpage or your local file system.

If you click **Continue**, you will be presented with the **Tips** screen. This screen does just what it implies, it shows you basic tips for using Konqueror so that you can begin to take full advantage of the technology **Konqueror** offers.

By clicking **Continue** from the **Tips** screen, you will see the **Specifications** screen. This screen displays information on supported standards (such as Cascading Stylesheets, plug-ins, and OpenSSL), featured protocols, and more.

To begin your first Web search, enter a URL in the open field beside **Location**.

For additional information on using **Konqueror**, click on **Help** (on the top menu panel) and then on **Konqueror Handbook**.
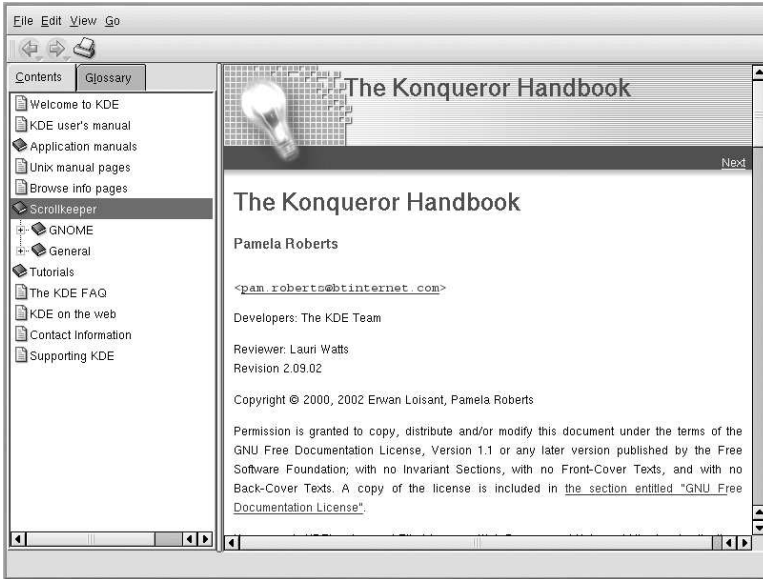
Figure 6-10. The *Konqueror Handbook*

6.4. Using Galeon to Browse the Web

Galeon is a GNOME browser, based on **Mozilla**. It is *only* a Web browser. It does not feature email, newsgroups, or anything other than surfing the Web. It is almost amazing in its simplicity.

To use **Galeon**, a working installation of **Mozilla** is required. **Galeon** uses **Mozilla**'s rendering engine to display content. If you cannot run **Mozilla**, it is doubtful that you would be able to run **Galeon**.

To launch **Galeon**, go to **Main Menu => Programs => Internet => Galeon**.

The first time you launch **Galeon**, it will take you through the configuration process.

Figure 6-11. Configuring Galeon

During the initial configuration, you have the option of importing bookmarks from **Netscape** or **Mozilla**, as well as some preference from **Netscape** if you have been using it as your prior Web browser.

Once you have finished your configuration of **Galeon**, the main browser will appear.

Figure 6-12. Online with Galeon

Tip

Galeon's "tabbed browsing" feature can help you avoid having your desktop cluttered with browser windows. Multiple pages can be stored in a single Galeon window, and you can switch between them with a click of the mouse. The behavior of the tabbed browsing mode can be configured in the **Tabs** page of the **Preferences Window**.

To launch a new Tab even more quickly, use the [Ctrl]-[T] key combination.

For additional information or help with **Galeon**, click **Help** on the top menu bar. From there, you can choose to view the **Galeon FAQ** and **Galeon manual**.

Chapter 7.
Email Applications

Many popular Web browsers and email applications are one in the same, such as **Mozilla**, but they do not have to be. Applications like **KMail** and **Evolution** let you get and send email, among other tasks, but they do not include Web browsers.

The purpose of this chapter is simple; to demonstrate how to use certain email applications to send and receive mail. It will not document each application feature, doing so is outside the scope of this manual.

This chapter will briefly discuss the following email applications:

- **Evolution**
- **KMail**
- **Mozilla Mail**
- Text-based email clients

When you first launch any email application, you must configure it so you can send and receive mail. In order to configure it properly, there are a few pieces of information you must know.

Your email address

> The email address you will use to send mail and receive mail. This is usually in the form of `yourname@someisp.net`.

Server type for receiving email (POP or IMAP)

> In order to receive mail, you must know what type of server your network administrator or ISP is using. This POP or IMAP address, is usually seen in the form of `mail.someisp.net`.

> POP, short for Post Office Protocol, is a protocol used to retrieve email from a mail server. Most email applications use the POP protocol, although some can use the newer IMAP (Internet Message Access Protocol).

> IMAP, short for Internet Message Access Protocol, is a protocol for retrieving email messages.

Server type for sending email (SMTP)

> Short for Simple Mail Transfer Protocol, a protocol for sending email messages between servers. Most email systems that send mail over the Internet use SMTP to send messages from one server to another; the messages can then be retrieved with an email client using either POP or IMAP. In addition, SMTP is generally used to send messages from a mail client to a mail server. This is why you need to specify both the POP or IMAP server and the SMTP server when you configure your email application.

If you have any questions regarding what information you need, contact your ISP or network administrator. Unless properly configured, you will not be able to make full use of the email applications discussed in this chapter.

7.1. Evolution

Evolution is more than just an email client. **Evolution** provides all standard email handling features, plus powerful mailbox management, user-defined filters, and quick searches. It supports a flexible calendar and allows users to create and confirm group meetings online. **Evolution** is the premier personal and workgroup information management tool for Linux and UNIX-based systems.

To launch **Evolution** in GNOME, go to **Main Menu => Programs => Applications => Ximian Evolution**.
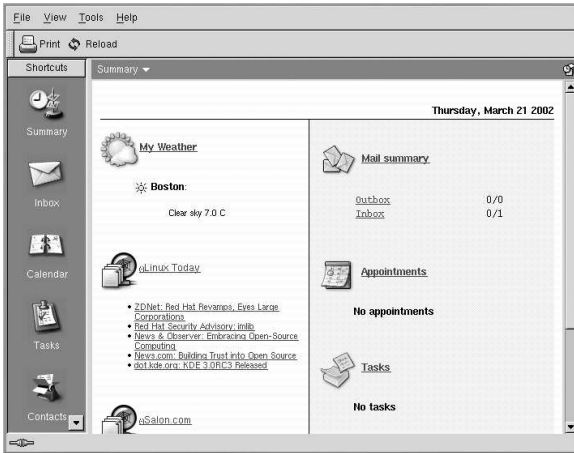
Figure 7-1. Evolution Main Screen

To see what is in your inbox or to send a mail, click on the **Inbox** icon.
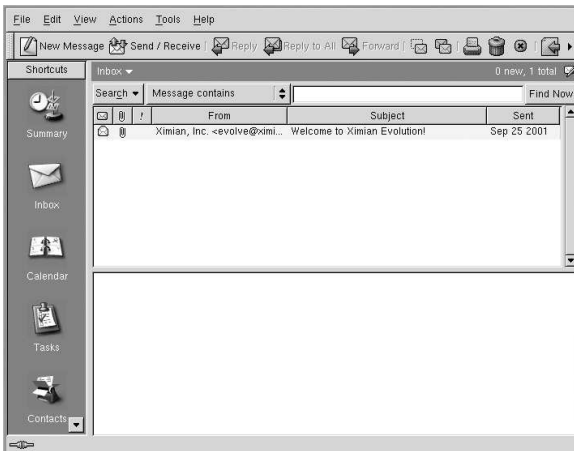
Figure 7-2. Evolution Inbox Screen

To compose a mail, select **New Message** from the toolbar.
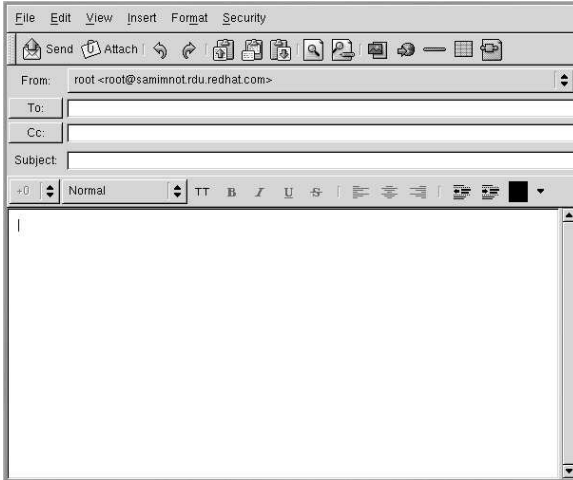
Figure 7-3. Evolution New Email Message Screen

Once you have composed a message and entered an email address to send the email to, click **Send** in the toolbar.

For additional information, click on **Help** from **Evolution**'s toolbar.

7.2. KMail

KMail is an email tool for KDE, the K Desktop Environment. It has an intuitive graphical interface that makes it simple to use. To open **KMail**, click on the main menu button on the panel and select **Internet => KMail**.

Before you can really use **KMail**, you must configure it so it can send and receive mail. To run the configuration tool, select **Settings** from the **KMail** toobar, and click on **Configure KMail**.

The **Configure Mail Client** window consists of seven sections: **Identity**, **Network**, **Appearance**, **Composer**, **Mime Headers**, **Security**, and **Miscellaneous**. To begin sending and receiving messages you will only have to change the settings in the **Identity** and **Network** tabs.

For additional information, refer to the **KMail** user manual (**Help => Contents**) or visit **KMail**'s homepage at http://kmail.kde.org.
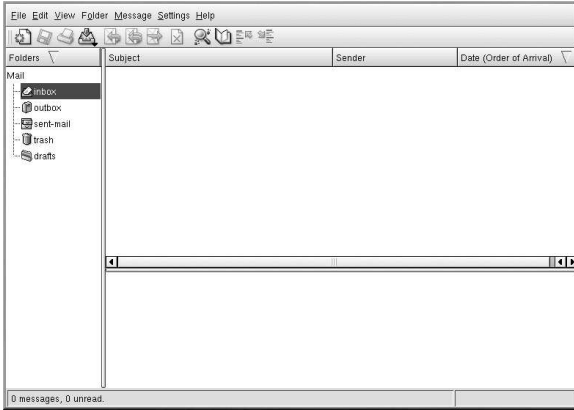
Figure 7-4. KMail Main Screen

The folders on the left side of the **KMail** screen allow you to view emails you have received, emails ready to be sent, emails you have sent, and more.

To compose a mail, click on the new message icon in the tool bar:
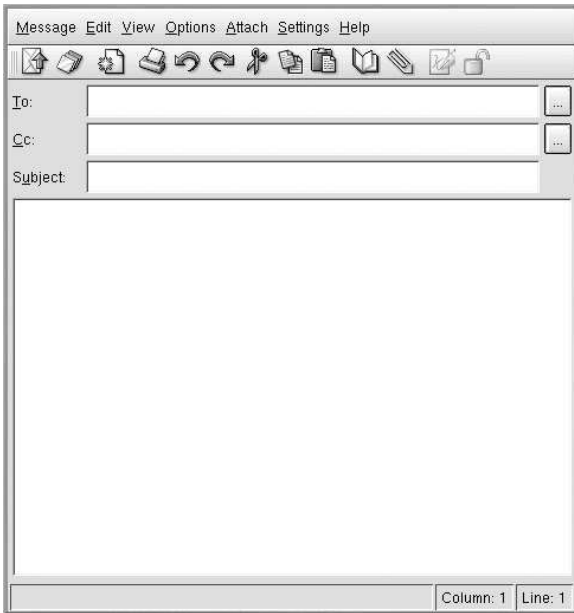
Figure 7-5. KMail New Email Message Screen

Once you have composed a message and entered an email address to send the email to, click **Send** in

the toolbar:

7.3. Mozilla Mail

This section covers briefly the basic steps for sending and receiving mail with **Mozilla**. The **Mozilla Help contents**, located under **Help** on the main menu, provide much more information.

To open the **Mozilla** mail tool while in **Mozilla**, click on the mail icon near the lower left corner of the **Mozilla Navigator** screen.
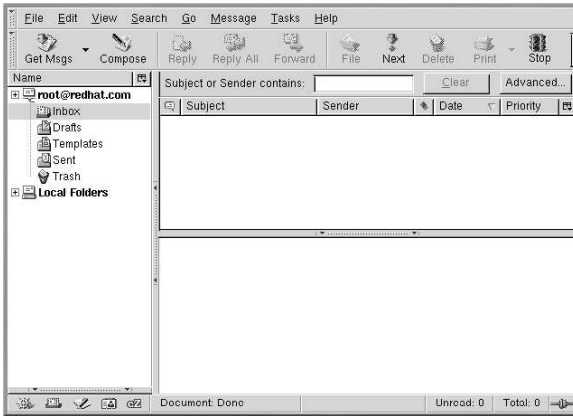
Figure 7-6. Mozilla Mail and News

You can also launch **Mozilla Mail Message** from the GNOME main menu by going to **Programs => Internet => Mozilla Mail Message**.
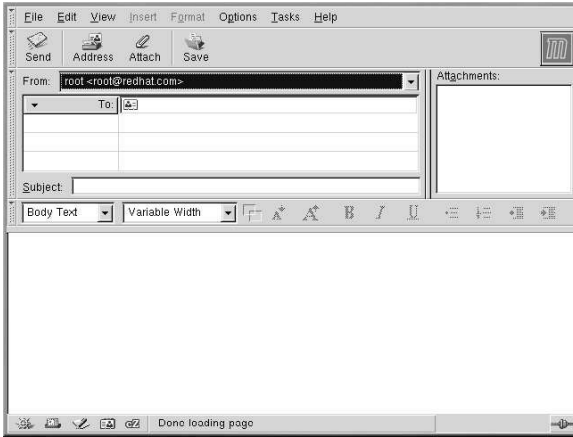
Figure 7-7. Mozilla Mail New Email Message Screen

To send an email, click on the **Send** button or go to **File => Send Now** or **Send Later**. If you choose to send later, you can go back to the main mail screen and go to **File => Send unsent messages**.

To read email, click on the mail folder you created for yourself to see a list of messages waiting for you. Then, click on the message you want to read.

Once you read a message, you can delete it, save it to a separate folder, and more.

7.3.1. Mozilla and Newsgroups

Newsgroups are Internet discussion groups with specific topics. The discussions take place via email and subscribing to a group is very easy. You don't even have to post messages if you don't want to; you can just "lurk." There are a great many newsgroups on the Web with topics ranging from politics to computer games to random strange thoughts.

To join a newsgroup, you first need to set up a newsgroup account. Click on your mail account name in the sidebar and select **Create a new account** from the options that appear on the right of the screen. The **New Account Setup** screen appears. Select **Newsgroup account** and click on **Next**.
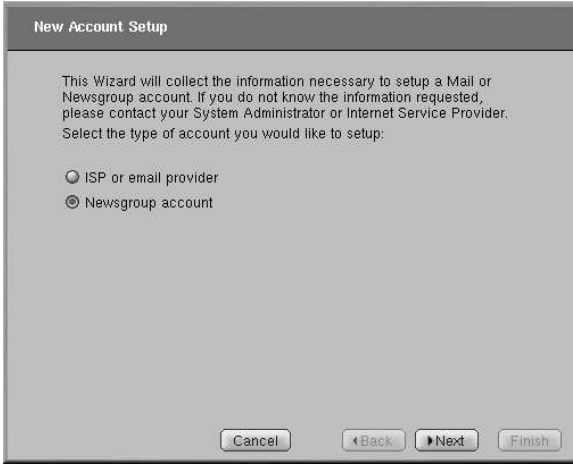
Figure 7-8. Newsgroup Account Setup

Enter your name and email address on the next screen and click **Next**. On the following screen, enter the name of your news server (if you do not know the name of your news server, contact your Internet service provider for this information). On the last few screens, you can determine the name that this account will be referred to and review your settings.

Now the newsgroup account you just created will appear in the sidebar of the **Mozilla** mail screen. Right-click on this account name and select **Subscribe**. A dialog box appears, listing all the news-groups available. Select the ones you want and click on **Subscribe**. When you are done, click on **OK**.

Now, click on the arrow next to the newsgroup account name and the list of groups you are subscribed to will appear beneath. Select the newsgroup you want to access and a dialog box appears with infor-mation about downloading and reading existing messages. Posting to a newsgroup is just like writing an email, except that the newsgroup name appears in the **To** field rather than an email address. To unsubscribe from a newsgroup, right-click on the group name and select **Unsubscribe**.

7.4. Plain Text Email Clients

Most modern email clients allow the user to select whether they want to send their emails in *plain text* or in HTML. The advantage of HTML formatted email is that they are are graphical (GUI). The particular font can be specified, the layout is very controllable, textures, pictures and backgrounds can be added; all this makes for a visually appealing message when it gets to the recipient.

On the other hand, plain text email is just that — plain text. They are not fancy, there are no pictures embedded in the email, there are no special fonts. Plain text emails are simple.

The term plain text refers to textual data in ASCII format. Plain text (also called *clear text*) is the most portable format because it is supported by nearly every application on every machine.

This chapter will discuss two plain text email clients, `PINE` and `mutt`.

7.4.1. Using `Pine`

`Pine` (acronym for `pine` is not `elm` or Program for Internet News and Email)is a character-based email client for UNIX systems.

To launch `pine`, type `pine` as a command at the system prompt. After starting `pine`, the **Main Menu** screen appears.
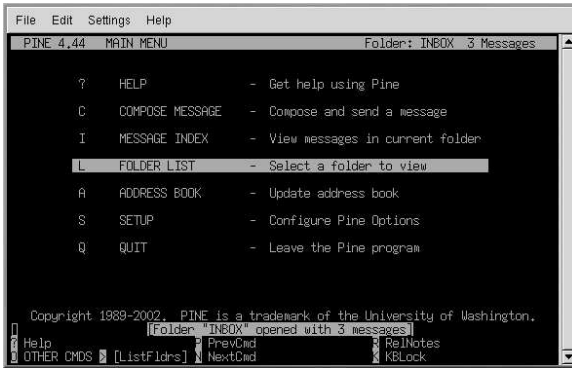
Figure 7-9. `Pine` **Main Screen**

Each `pine` screen has a similar layout: the top line tells you the screen name and additional useful information, below that is the work area (on the **Main Menu** screen, the work area is a menu of options), then the message/prompt line, and finally the menu of commands.

From the **Main Menu** you can choose to read online help, compose and send a message, look at an index of your mail messages, open or maintain your mail folders, update your address book, configure `pine`, and quit `pine`. There are additional options listed at the bottom of the screen as well.

To write a message, press [C] (Compose). You see the **Compose Message** screen.

Figure 7-10. `Pine` **Compose Message Screen**

Different commands are available to you when your cursor is in different fields on this screen. To see additional commands available when your cursor is in the Message Text field, type [Ctrl]-[G] (Get Help). For example, to move around, use the arrow keys or [Ctrl]-[N] (Next line) and [Ctrl]-[P] (Previous line); to correct typing errors, use [Backspace] or [Delete].

In the command menu above, the **^** character is used to indicate the Control key. This character means you must hold down the Control ([Ctrl]) key while you press the letter for each command.

When you want to leave Pine, press [Q] (Quit).

To view a message in the **Message Index** screen, use the arrow keys to highlight the message you want to view. Press [V] (ViewMsg) or press [Enter] to read a selected message. To see the next message, press [N] (NextMsg). To see the previous message, press [P] (PrevMsg) To return from your message to the Message Index, press [I] (Index).

For addition help with `pine`, refer to the `pine` man page. To view this man page, type the command `man pine` at a shell prompt.

7.4.2. Using `mutt`

`Mutt` is a small but very powerful text-based mail client for Unix operating systems.

`Mutt`'s configuration file, `~/.muttrc`. gives `mutt` its flexibility and configurability. It is also this file that might give new users problems. The number of options that `mutt` has available to it are truly astounding. `mutt` allows the user to control about every function `mutt` uses to send, receive, and read your mail. As is true with all powerful software, it takes time to understand the features and what they can do for you.

Most of the options are invoked using the `set` or `unset` commands, with either boolean or string values, e.g. `set folder = ~/Mail`.

All configuration options can be changed at any time by typing a [:] followed by the relevant command. For example `:unset help` turns off the handy keyboard command hints at the top of the screen. To turn those hints back on, press up-arrow to retrieve the last command and change it so it says `:set help`.

If you cannot remember the command you want to use, there is always tab-completion to help you.

You do not have to type all your preferred configuration commands each time you run `mutt`, you can save them in a file which is loaded every time the program starts up. This configuration file needs to exist in your home directory, it has to be called either `~/.muttrc` or `~/.mutt/muttrc`.

When you launch mutt, the first thing you see is a screen with a list of email messages. This initial menu is called the index.
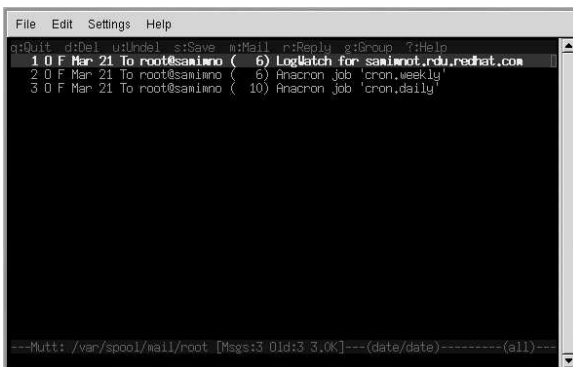
Figure 7-11. `mutt` Main Screen

These messages are in a default mail folder, often called the *mailspool*, that you can think of as your inbox. Use the [K] and [J] keys on your keyboard to move the highlighted cursor up and down the list of messages.

In the index or pager views, use the [R] key to reply to a message or the [M] key to create a new one. Mutt will prompt for the **To:** address and the **Subject:** line. A text editor (defined by your $EDI-TOR environmental variable in the configuration file) will then launch allowing you to compose your message. Type away, when you save and exit, you are done.

After the editor, mutt drops you into the compose menu, here you can fine-tune your message headers, change the encoding, add file attachments or simply hit the [Y] key to say yes and send your email on its way.

To learn more, refer to the man pages for muttrc and mutt (type man muttrc or man mutt at the shell prompt). You may also find the mutt manual to be very helpful. The mutt manual is installed in /usr/share/doc/mutt-1.2.x, where x is the version number of mutt installed on your system.

Chapter 8.
Printer Configuration

This chapter provides information on configuring, testing, and modifying a local printer with **print-conf**. For information on configuring other types of printers, creating printer aliases, and more, refer to the *Official Red Hat Linux Customization Guide* or click on the **Help** button once you open the **printconf** application.

Red Hat Linux comes with two different printing systems: LPRng and CUPS. LPRng is the default printing system. It is recommended that new users use the default printing system as described in this chapter. For information on the CUPS printing system, refer to the *Official Red Hat Linux Customization Guide*.

To use **printconf**, you must have root privileges. To start **printconf**, use one of the following methods:

- On the GNOME desktop, select **Main Menu Button** (on the Panel) **=> Programs => System => Printer Configuration** to start the graphical version.

- On the KDE desktop, select **Main Menu Button** (on the Panel) **=> System => Printer Configuration** to start the graphical version.

- Type the command `printconf-gui` at a shell prompt (for example, in an XTerm or a GNOME terminal) to start the graphical version. [1]

- You can also run **printconf** as a text-based application if you do not have the X Window System installed, or you just prefer the text-based interface. To run it, log in as root (or use the command `su` to temporarily change to the root user), and type the command `/usr/sbin/printconf-tui` from a shell prompt.

> ⭐ **Important**
>
> 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 8-1. printconf

This chapter explains local printer configuration only, but five types of print queues can be configured with **printconf**:

- **Local Printer** — a printer attached directly to your computer through a parallel or USB port. In the main printer list as shown in Figure 8-1, the **Queue Type** for a local printer is set to **LOCAL**.
- **Unix Printer (lpd Spool)** — a printer attached to a different UNIX system that can be accessed over a TCP/IP network (or example, a printer attached to another Red Hat Linux system on your network). In the main printer list as shown in Figure 8-1, the **Queue Type** for a remote UNIX printer is set to **LPD**.
- **Windows Printer (SMB)** — a printer attached to a different system which is sharing a printer over a SMB network (for example, a printer attached to a Microsoft Windows machine). In the main printer list as shown in Figure 8-1, the **Queue Type** for a remote Windows printer is set to **SMB**.
- **Novell Printer (NCP Queue)** — a printer attached to a different system which uses Novell's Net-Ware network technology. In the main printer list as shown in Figure 8-1, the **Queue Type** for a remote Novell printer is set to **NCP**.
- **JetDirect Printer** — a printer connected directly to the network instead of to a computer. In the main printer list as shown in Figure 8-1, the **Queue Type** for a JetDirect printer is set to **JETDIRECT**.

See the *Official Red Hat Linux Customization Guide* or click on the **printconf Help** button for information on configuring printers other than 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. The changes are not written to the `/etc/printcap` configuration file until the printer daemon (`lpd`) is restarted. Alternatively, you can choose **File => Save Changes** and then choose **File => Restart lpd** to save your changes and 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 from the list and click the **Delete** button.

8.1. Adding a Local Printer

To add a local printer such as one attached to the parallel port or USB port of your computer, click the **New** button in the main **printconf** window. The window shown in Figure 8-2 will appear. Click **Next** to proceed.

Add A New Print Queue

On the following screens, you will be asked to provide information for adding a new print queue.

Nothing will be done to your settings until you hit "Finish" on the last screen.

◁ Back   ▷ Next   ✕ Cancel
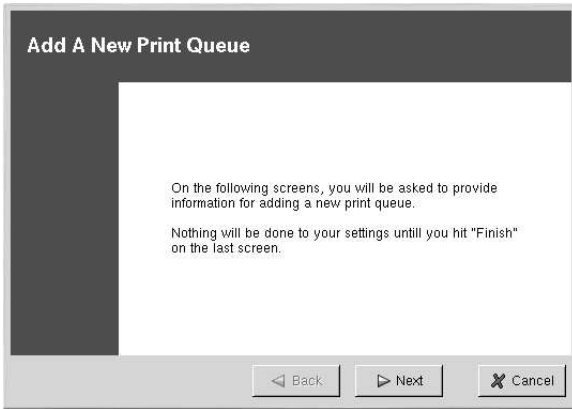
Figure 8-2. Adding a Printer

You will then see the screen shown in Figure 8-3. Enter a unique name for the printer in the **Queue Name** text field. This can be any descriptive name for your printer. The printer name 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 _.

Select **Local Printer** from the **Queue Type** menu, and click **Next**.

Set the Print Queue Name and Type

Enter the Queue's name, and select the Queue's Type.
Valid names can contain the characters "a-z", "A-Z", "0-9", "-", and "_".
They must begin with letters.
Queue Name:

test

Queue Type
- ⦿ Local Printer   LOCAL
- ○ Unix Printer   LPD
- ○ Windows Printer   SMB
- ○ Novell Printer   NCP
- ○ JetDirect Printer   JETDIRECT

◁ Back   ▷ Next   ✕ Cancel
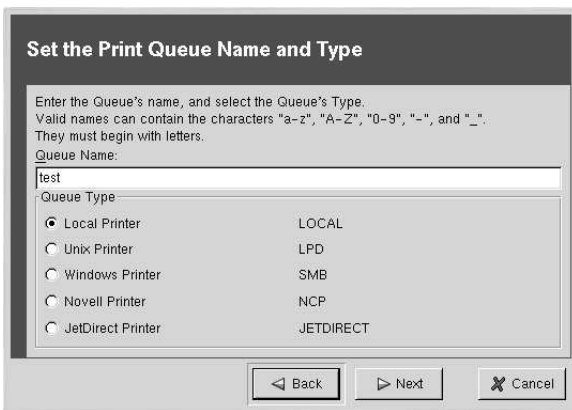
Figure 8-3. Adding a Local Printer

printconf attempts to detect your printer device and display it as shown in Figure 8-4. If your printer device is not shown, click **Custom Device**. Type the name of your printer device and click **OK** to add

it to the printer device list. After selecting your printer device, click **Next**.
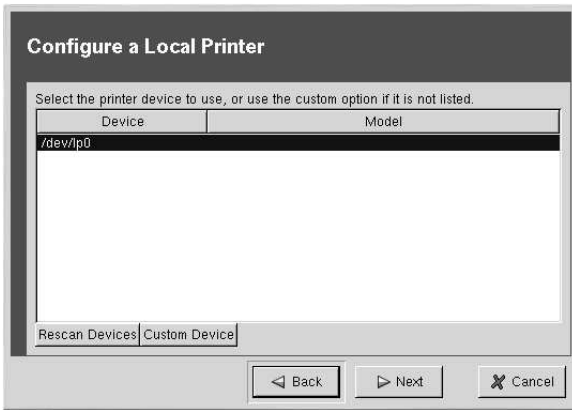
Figure 8-4. Choosing a Printer Device

Next, **printconf** will try to detect which printer is attached to the printer device you selected as shown in Figure 8-5. If it detects the wrong printer or does not detect any printer, you can manually select one. The printers are divided by manufacturers. Click the arrow beside the manufacturer for your printer. Find your printer from the expanded list, and click the arrow beside the printer name. A list of drivers for your printer will appear. Select one. If you do not know which one to use, select the first one in the list. If you are having problems using that driver, edit the printer in **printconf** and select a different driver.
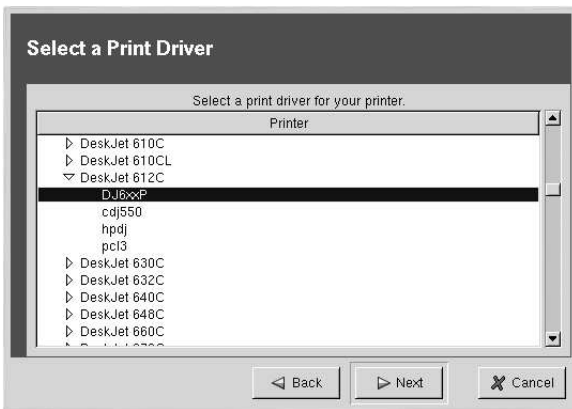
Figure 8-5. Choosing a Printer Driver

The last step is to confirm your printer. Click **Finish** if this is the printer that you want to add. Click **Back** to modify your printer configuration.

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 8.1.1 for details.

8.1.1. Printing a Test Page

After you have configured your printer, you should print a test page to make sure the printer is functioning properly. To print a test page, select the printer that you want to test from the printer list, and choose **Test => Print US Letter Postscript Test Page**, **Print A4 Postscript Test Page**, or **Print ASCII Test Page** from the pulldown menu. If your printer does not support PostScript printing, choose to print the ASCII test page.

8.2. Modifying Existing Printers

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 ![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 cannot 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 ![icon] 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 ![icon] symbol beside it in the first column of the printer list.

After adding your printer(s), you can edit settings by selecting the printer from the printer list and clicking the **Edit** button. The tabbed window shown in Figure 8-6 will appear. The window contains the current values for the printer that you selected to edit. Make any changes, and click **OK**. Click **Apply** in the main **printconf** window to save the changes and restart the printer daemon.
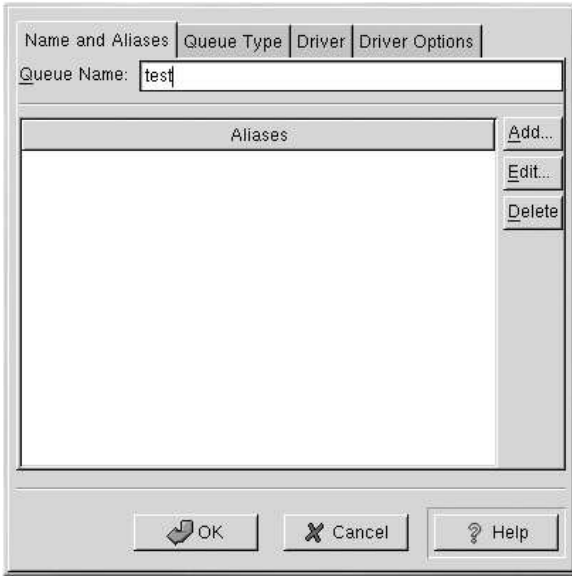
Figure 8-6. Editing a Printer

8.2.1. Names and Aliases

If you want to rename a printer, change the value of **Queue Name** in the **Names and Aliases** tab. Click **OK** to return to the main window. The name of the printer should change in the printer list. Click **Apply** to save the change and restart the printer daemon.

A printer alias is an alternate name for a printer. To add an alias for an existing printer, click the **Add** button in the **Name and Aliases** tab, enter the name of the alias, and click **OK**. Click **OK** again to return to the main window. Click **Apply** to save the aliases and restart the printer daemon. A printer can have more than one alias.

8.2.2. Queue Type

The **Queue Type** tab shows queue type that you selected when adding the printer and its settings. You can change the queue type of the printer or just change the settings. After making modifications, click **OK** to return to the main window. Click **Apply** to save the change and restart the printer daemon.

Depending on which queue type you choose, you will see different different options. Refer to the appropriate section on adding a printer for a description of the options.

8.2.3. Driver

The **Driver** tab shows which print driver is currently being used. This is the same list that you used when adding the printer. If you change the print driver, click **OK** to return to the main window. Click **Apply** to save the change and restart the printer daemon.

If you are having problems printing, try selecting a different driver from this list and printing a test page. Some drivers might work better than others for your printer.

8.2.4. Driver Options

The **Driver Options** tab displays advanced printer options. Options vary for each print driver. Common options include:

- **Send Form-Feed (FF)** should be selected if the last page of your print job is not ejected from the printer (for example, the form feed light flashes). If this does not work, try selecting **Send End-of-Transmission (EOT)** instead. Some printers require both **Send Form-Feed (FF)** and **Send End-of-Transmission (EOT)** to eject the last page.

- **Send End-of-Transmission (EOT)** if sending a form-feed does not work. Refer to **Send FF** above.

- **Assume Unknown Data is Text** should be selected if your print driver does not recognize some of the data sent to it. Only select it if you are having problems printing. If this option is selected, the print driver will assume that any data that it can not recognize is text and try to print it as text. If you select this option and **Convert Text to Postscript**, the print driver will assume the unknown data is text and then convert it to PostScript.

- **Prerender Postscript** should be selected if you are printing characters beyond the basic ASCII set but they are not printing correctly (such as Japanese characters). This option will prerender non-standard PostScript fonts so that they are printed correctly.

  If your printer does not support the fonts you are trying to print, try selecting this option. For example, you should select this option if you are printing Japanese fonts to a non-Japanese printer.

  Extra time is required to perform this action. Do not choose it unless you are having problems printing the correct fonts.

- **Convert Text to Postscript** is selected by default. If your printer can print plain text, try unselecting this when printing plain text documents to decrease the time it takes to print.

- **Page Size** allows you to select the paper size for your printer such as US Letter, US Legal, A3, and A4.

- **Effective Filter Locale** defaults to **C**. If you are printing Japanese characters, select **ja_JP**. Otherwise, accept the default of **C**.

If you modify the driver options, click **OK** to return to the main window. Click **Apply** to save the change and restart the printer daemon.

8.3. Additional Resources

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

8.3.1. Installed Documentation

- `man printcap` — The manual page for the `/etc/printcap` printer configuration file.
- *Official Red Hat Linux Customization Guide*

8.3.2. Useful Websites

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

Chapter 9.

Audio, Video, and General Amusement

This chapter has been written to give you a look at the lighter side of Red Hat Linux. From games and toys to audio and video applications, Red Hat provides many packages to help keep the kid in you alive.

9.1. Playing CDs

You should be able to put a music CD in your CD-ROM and see the CD player start automatically. If not, in GNOME, go to **Main Menu => Programs => Multimedia => CD player** to open the CD player. In KDE, go to **Main Menu => Multimedia => CD Player**.

Figure 9-1. 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 CDDB to have the CD title located in an extensive online database and its song titles listed in the GUI (if the CD title and songs do not appear in the GUI, the CD is not in the database). 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.

9.2. Playing MP3s

MP3 is the file extenstion for MPEG, audio 3. The popularity of MP3s increases daily as MP3 files are small and can easily be transferred across the Internet.

To take advantage of this technology, Red Hat provides the *X Multimedia System* (**XMMS**). **XMMS** is a cross-platform multimedia player that allows you to play your MP3 files.

Figure 9-2. XMMS Interface

XMMS can be used for more than just playing MP3 audio files. By default **XMMS** can play MPEG audio, Ogg Vorbis, RIFF wav, most module formats, and a few other formats. **XMMS** can be extended through plugins to play a number of other audio and video formats.

To learn more about **XMMS**, refer to the **XMMS** man page by typing `man xmms` at the shell prompt.

To launch **XMMS** in GNOME, go to **Main Menu => Programs => Multimedia => XMMS**.

To launch **XMMS** from a shell prompt, type the command `xmms`.

9.3. Troubleshooting Your Sound Card

If, for some reason, you do not hear sound and know that you do have a sound card installed, you can run 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 configuration screens, use your [Tab] and [Enter] keys.

Note

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 are 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 does not find any cards, you will be presented with a list from which you can select your card. Use the [Up Arrow] 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 have selected the right settings for your card, you will 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.

9.3.1. If sndconfig Does Not Work

If **sndconfig** does not work (if the sample does not play and you still do not have audio sounds), there are alternatives, although they are 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.

9.3.1.1. Manual Soundcard Configuration

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
```

9.4. Troubleshooting Your Video Card

Video card configuration is handled during the Red Hat Linuxinstallation (see the *Official Red Hat Linux Installation Guide*). However, if you did not choose to configure a video card at that time, or if you need to reconfigure your settings, you can use the **Xconfigurator** utility. You will want to do this if you, for example, install a new video card.

> **Caution**
>
> **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 that 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.

9.5. Games

The games and amusing applets give you fun ways to pass the time.

GNOME's games are not divided into categories, but the variety is still there with games like **Free Cell**, **Tux Racer**, **Chess**, and the arcade-style game that covers your entire desktop— **Penguin Command**.

To open games in GNOME, go to **Main Menu => Programs => Games**.

KDE's games are broken down into categories: **Arcade** games, like Asteroids; **Cardgames**, like poker; **Boardgames**, like backgammon and mahjongg; and **Tactics & Strategy** games, like minesweeper.

In KDE, go to **Main Menu => Games**. Many games include rules and tips within the menu options.

9.6. Amusements

Computer programmers can be very entertaining people. Applets, or small applications, are created and added to software for no other reason than to amuse.

Figure 9-3. gEyes — Watches every move your mouse makes

Most of these are on-screen toys, like GNOME's **Wanda The Fish**, which opens a dialog box displaying a quote that changes every time you click on the icon, and KDE's **AMOR**, which places a little smiley face (or another creature of your choice) on the top border of your desktop's active window that interacts with you.

Figure 9-4. GNOME's Wanda the Fish

Other applets you may find to be very useful; KDE's **World Clock** presents a map of the world and time zone information just by scrolling your mouse around the map, and GNOME's **GNOME Weather** displays a mini weather report on the panel.
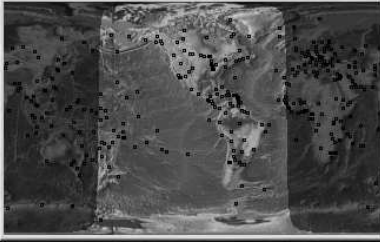
Figure 9-5. World Clock, a KDE toys that displays time zone information

To access applets in GNOME, go to **Main Menu => Applets** and look through the programs available in **Amusements** and **Utility**. Applets include **Game of Life**, **Where Am I**, **Odometer**, and **GNOME Weather**.

KDE has a main menu option called **Toys** where you will find **AMOR**, **Potato Guy**, **Tea Cooker**, and more.
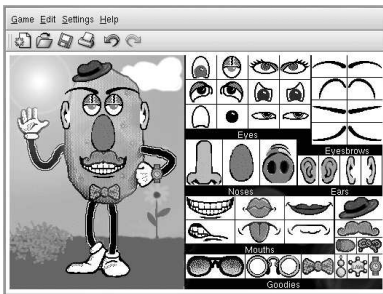
Figure 9-6. Potato Guy — Make your own potato friend

9.7. Finding Games Online

There are many more games available within Red Hat Linux and online than can be documented here. For more information, here are a few suggestions:

- http://www.lokigames.com/
- http://www.linuxquake.com/
- http://www.tuxgames.com

- http://www.linuxgamingnews.com/
- http://happypenguin.org/

You can also browse the Internet for "linux games" using a search engine, such as http://www.google.com.

Chapter 10.
Working with Images

There are several types of image files. Some images are created using sophisticated software packages, while others are made from digital cameras and scanners. You may have downloaded some of these image files from the Internet or received them in an email. You may also want to create your own images to send to others. You can view and manipulate the most common types of image files using the many applications included in Red Hat Linux.

10.1. Viewing Images

This section discusses some of the common tools for viewing image files. Certain tools available are specialized applications with several functions that enhance your image viewing experience; while others are general-purpose browsers that have some image viewing functionality.

10.1.1. Using Nautilus to view Images

Nautilus is a general-purpose file manager and browser for the GNOME desktop environment. **Nautilus** has many functions beyond simple image viewing; however, for this section, we will use it for basic image browsing. For more information about **Nautilus**, see Chapter 2.

Nautilus is known for its ease-of-use, and it handles images with the same ease as it does for other file types. To begin browsing your image collection with **Nautilus**, double-click on your home desktop icon:

You will be presented with a view of all the files and folders within your home directory. Double-click the image (or folder containing the image) and **Nautilus** will open the new file or folder within its browser window. Figure 10-1 shows that **Nautilus** automatically creates thumbnails of any images in your folders:
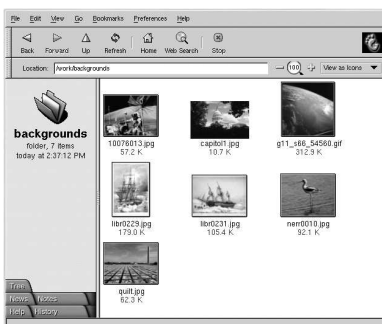
Figure 10-1. Contents of a Folder in Nautilus

Double-click on any thumbnail icon to view the image in its native size. The image will load within the browser window, along with a thumbnail view and detailed file information along the left panel. Below the file information are advanced options for working with the file. By default, **Nautilus** offers you the option of opening the file with **Electric Eyes**, a robust image viewer with more advanced imaging features than **Nautilus**. You can also open the file with the **GIMP**, a powerful image manipulation application. More information about using the **GIMP** can be found in Section 10.2.

To increase and decrease the size of the viewed image in **Nautilus**, click on the magnifying glass icon on the location bar as shown in Figure 10-2:

Figure 10-2. The Zoom Function in Nautilus

Click the **+** icon to increase the size of the image or **-** to decrease it.

10.1.2. Using Konqueror View Images

If you use **KDE** as your desktop environment, then you can use the **Konqueror** file manager to view images. Simply click on your home directory desktop icon to access the **Konqueror** file manager:

Konqueror works similarly to **Nautilus**. Image files within a folder are displayed as automatically-generated thumbnail icons within the browser. When you click on a thumbnail icon, the browser displays the image in its native size, as shown in Figure 10-3.
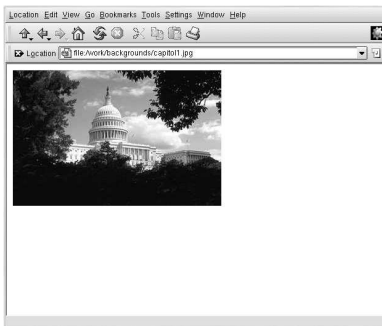
Figure 10-3. Viewing an Image in Konqueror

To zoom in and out of images within **Konqueror**, you first need to change the way it renders the image. From the top toolbar, choose **View => View Mode => Image Viewer**. This will re-display the image and allow for zooming in and out using the two magnifying glass icons on the toolbar, as shown in Figure 10-4.

Figure 10-4. Zooming buttons in the Konqueror toolbar

You can also open the image with more advanced image viewers, as well as with the **GIMP**. Right-click on the image and choose **Open With...**. A pop-up menu will appear allowing you to open the application you wish to use. To launch the **GIMP**, choose **Graphics** and scroll down the list of applications. Click on the **GIMP** icon and click **OK**, as seen in Figure 10-5.
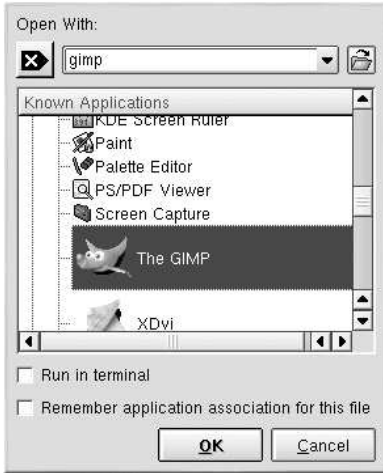
Figure 10-5. The Open With... Dialog Box

10.1.3. Using GQview

GQview is a powerful image viewer for GNOME desktop users that supports several image file formats, including:

- JPG/JPEG
- GIF
- PGM
- XPM
- PNG
- PCX
- TIF/TIFF
- PPM
- BMP

GQview is useful for viewing individual image files as well as browsing collections of files in folders. It supports zoom in and zoom out functions, as well as thumbnail views of all image files within a directory. It also supports several advanced options not found in the simple image viewers listed above.

GQview can be started from the GNOME and KDE panels. Choose **Main Menu => Programs => Graphics => GQview** to start the application in GNOME. For KDE users, choose **Start Application => Programs => Graphics => GQview**. If you are at a shell or terminal prompt, start the application by typing gqview. Upon start-up, **GQview** will browse your user home directory by default. If you have any images in this directory, the gallery panel will automatically generate thumbnails for you to highlight and view in the main display area.

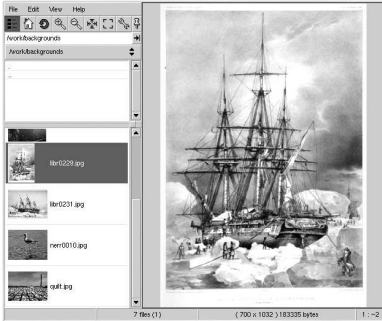**Figure 10-6. GQview Displaying a `.jpg` Image**

The interface of **GQview** is simple and straightforward. The toolbar allows you to fit the image to the display window, zoom in and out and toggle between thumbnail view and text-only browser panels. It also has a text field for you to enter a particular path to your image directories. Right-clicking on an image in the display area opens a pop-up menu of image size and other file options such as renaming, moving, copying. You can also hide and unhide the thumbnail file panel and toggle windowed and fullscreen modes within the pop-up menu.

You can also combine functions within **GQview** and create a dynamic presentation effect for groups of images within a directory. In the text field below the toolbar, type the path to the the directory where your images are located and highlight the first image in the thumbnail file list panel on the left. Now press [V] then [S], and you will start a full-screen slideshow where **GQview** displays images against a black background over your entire desktop. By default, each image in the slideshow is presented for 15 seconds. You can stop and resume the slideshow at any time by pressing [S]. When the slideshow ends, press [V] to exit full-screen mode.

GQview can also be used to change your desktop wallpaper quickly and easily. Right-click on the image and choose **Edit => Set as wallpaper**. From the **Edit** menu, you can also choose to open the file with a number of image editing utilities, including the **GIMP**, **Electric Eyes**, **Xview**, and **Xpaint**.

GQview also allows you to customize several settings by clicking the **Configure** button:

The configuration pop-up menu allows advanced users to configure several options. You can customize a directory on startup, change thumbnail sizes, and even change the default image editors to manipulate the file if you would like to use one that is not listed.
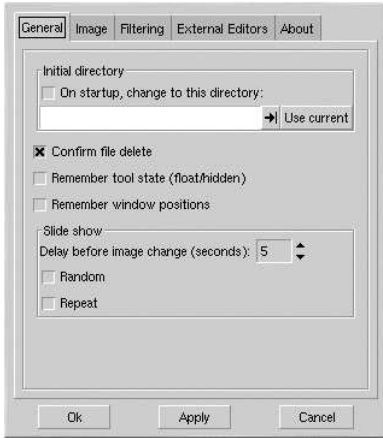
Figure 10-7. The GQview Options Dialog Box

10.1.4. Electric Eyes

If you want a quick and simple way of viewing one file, **Electric Eyes** may be for you. To start **Electric Eyes** from a GNOME desktop, choose **Main Menu => Programs => Graphics => Electric Eyes**. For KDE users, choose **Start Application => Programs => Graphics => Electric Eyes**. You can also type ee at a shell prompt. Right-click the **Electric Eyes** logo to open the pop-up menu and load an image. Right-click on displayed images to configure certain aspects of the image as well as the **Electric Eyes** environment.

For example, to open the **Editing Controls**, choose **View => Show/Hide Edit Window**, and the **Editing Control** dialog box will pop up, allowing you to change brightness and color saturation levels on the image.

Figure 10-8. Editing Options in Electric Eyes

Buttons along the bottom of the **Editing Control** window let you zoom in and out of an image incrementally by percentage, fit the image to the screen, and even turn the image 90% clockwise, or invert (flip) the image horizontally or vertically. **Electric Eyes** is an ideal choice for viewing and manipulating single images.

10.2. Manipulating Images with the GIMP

The GNU Image Manipulation Program (**GIMP**) is a powerful tool that can be usedto create, alter, manipulate, and enhance digital image files — photographs, scanned images, computer-generated images, and more. This section offers a quick overview of the **GIMP** and refers you to comprehensive references for learning more about it.

10.2.1. 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 **Start Applications => Graphics => The GIMP**.

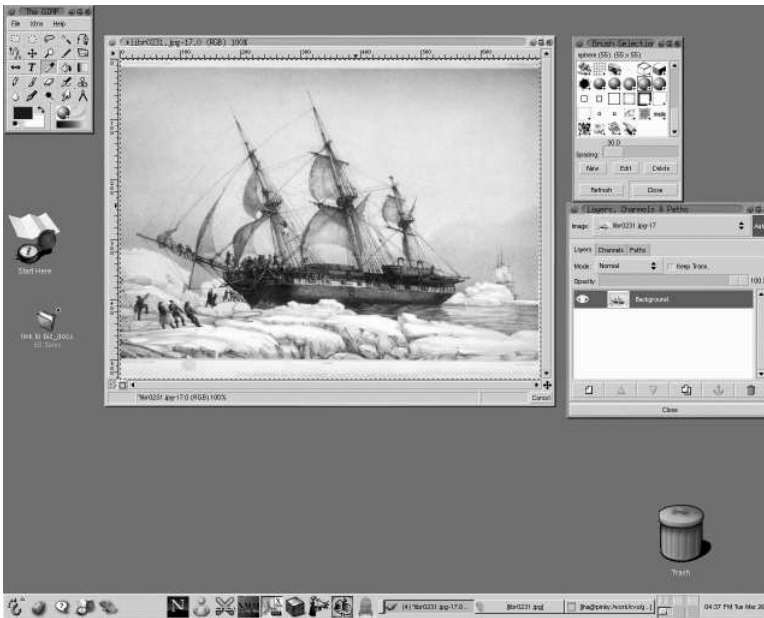Figure 10-9 shows a typical **GIMP** session in action.

Figure 10-9. The GIMP in Action

10.2.2. Loading a File

To load an existing file, click on **File => Open**. You will see the **Load Image** dialog, as shown in Figure 10-10.
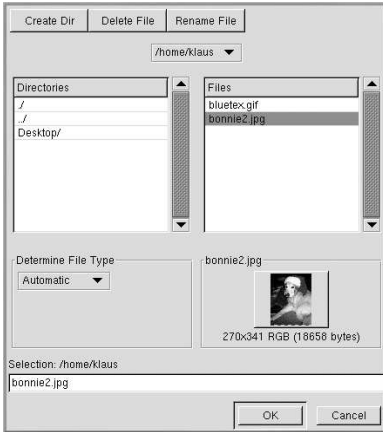
Figure 10-10. The Load Image Dialog

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

File name completion is supported by the **GIMP**. If you type the first letter (or more) of a file name 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 file name to open it.

10.2.3. 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** and the file has not been saved before.

The **Save Image** dialog looks almost exactly like the **Load Image** dialog and navigation of the file system 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, including `.gif`, `.png`, `.jpg`, and `.bmp`.

10.2.4. GIMP Options

Like many applications, the **GIMP** provides more than one method to accomplish tasks. The easiest way to work with images is to right-click the image, which will display a set of menus containing most of the **GIMP**'s many capabilities, including image sizing, rotation, and filter application.

For example, imagine you have a picture that you would like to modify to make it look as if it were clipped from a newspaper. To do this, right-click on the image and select **Filters => Distorts => Newsprint...**. Select the quantity of lines per inch using the sliders. When you reach a desired quantity

and are ready to render the image, click **OK**. The **GIMP** will then render the image with the new effect applied. Figure 10-11 shows an example of an image after the **Newsprint** filter has been applied:
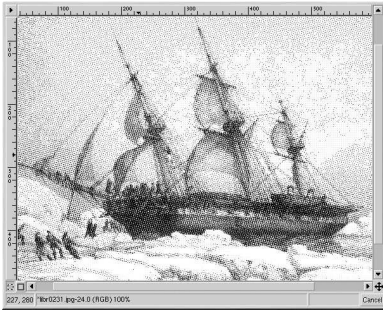

Figure 10-11. An Image modified with a GIMP Filter

The **Toolbox** also has several easily accessible functions. Using the **Toolbox**, you can add text to images, erase regions of an image, or even fill selected regions with the color of your choice.

For example, if you wish to add text to a file, select the [T] button and click on your image. This will load the **Text Tool** dialog box, where you can choose a font and type some text in the provided text box. Click **OK** and your text will be displayed in as a floating section on the image. You can then move the text to the position you wish using the **Move Layers** tool. Figure 10-12 shows our photo with exciting new text:
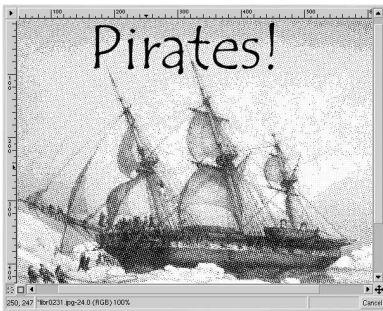
Figure 10-12. Using the Text Tool on an Image

As you can see, the **GIMP** is a powerful imaging tool, and it takes some time to master all of the functions. Try exploring some of the options yourself. If you make a mistake, do not worry. You can always undo your mistakes by right-clicking on the image and choosing **Edit => Undo**.

10.3. Additional Resources

While this chapter covers several applications briefly, there is so much more you can do with them. Refer to the following resources if you are interested in learning more about the applications in this

chapter.

10.3.1. Useful Websites

The Web has several sites of interest if you are looking for more detailed information about an application covered in this chapter:

- http://gqview.sourceforge.net — The official **GQview** home page.
- 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* website.
- http://gimp-savvy.com/ — The companion website to the book *Grokking the GIMP*, by Carey Bunks. The entire book is also available on the site for download!
- http://tigert.gimp.org/gimp/ — The **GIMP** website of tigert (Tuomas Kuosmanen).

10.3.2. Related Documentation

Some applications discussed have online documentation included with the package, accessible right from your PC.

- For more information about using **GQview**, refer to the documentation in `/usr/share/doc/gqview-<version-number>/README` (where `><version-number>` is the version of **GQview** installed on your system).
- The **GIMP** manual page contains some of the more advanced command-line options and environment variables associated with it. You can read the manual page by typing `man gimp` at a shell or terminal prompt.

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; Coriolis Group
- *Grokking the GIMP* by Carey Bunks; New Riders Publishing
- *Sams Teach Yourself GIMP in 24 Hours* by Joshua and Ramona Pruitt; Sams

redhat.

Shell Prompt Basics

11.1. Why Use a Shell Prompt

Graphical environments for Linux have come a long way in the past few years. You can be perfectly productive in the X Window System, and only have to open a shell prompt to complete a few tasks.

However, many Red Hat Linux functions can be completed faster from the shell prompt than from a GUI. In less time than it might take you to open a file manager, locate a directory, and then create, delete, or modify files from a GUI, you could have finished your work with just a few commands at a shell prompt.

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. Experienced users can write shell scripts to expand their capabilities even more.
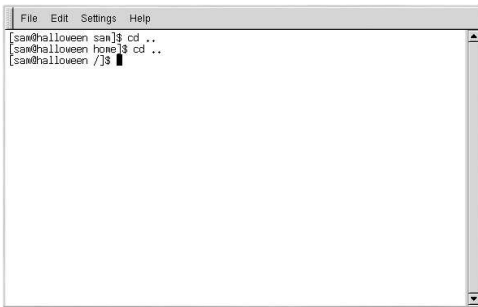
```
File  Edit  Settings  Help
[sam@halloween sam]$ cd ..
[sam@halloween home]$ cd ..
[sam@halloween /]$ █
```

Figure 11-1. A Shell Prompt

This section explains how to navigate, manipulate files, perform simple administration tasks, and other shell prompt basics.

11.2. 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 that 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 available at that time. This lead 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`. Although your system came with several different shells, `bash` is the default shell for Red Hat Linux. You can learn more about `bash` by reading the `bash` man page (type `man bash` at a shell prompt).

11.3. Determining Your Current Directory with `pwd`

Once you start looking through directories, it is easy to get lost or forget the name of your current directory. **bash** shows, by default, just your current directory, not the entire path.

```
  File  Edit  Settings  Help
[sam@halloween sam]$ pwd
/home/sam
[sam@halloween sam]$ ▮
```
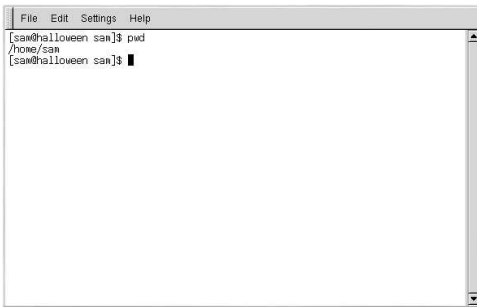
Figure 11-2. The Command `pwd` Shows You Where You Are

To determine the exact location of your current directory within the file system, go to a shell prompt and type the command `pwd`.

You should see something like:

```
/home/sam
```

This tells you that you are in the user `sam`'s directory, which is in the `/home` directory.

The command `pwd` stands for print working directory. When you typed `pwd`, you asked your Linux system to display your current location. Your system responded by printing the name of the current directory in the terminal window, also known as the standard output.

You will find that using `pwd` is very helpful as you learn to navigate your new Linux system.

11.4. 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.

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 with / (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.

Executing the command

```
cd directory1
```

while you are in `directory3`, will present you with an error message explaining that there is no such directory. This is because there is no `directory1` below `directory3`.

To move up to `directory1`, type:

```
cd /directory1
```

This is an example of an absolute path. It tells Linux to start at the top (`/`) and look down until it finds `directory1`. A path is absolute if the first character is a `/`. Otherwise, it is a relative path.

Absolute paths will take you to any directory, from any directory. Relative paths will only take you to directories below your current one.

Use the following exercise to test what you have learned so far regarding absolute and relative paths. From your home directory, type the relative path:

```
cd ../../etc/X11
```

The command `cd ..` tells your system to go up to the directory immediately above the one in which you are currently working. `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 will 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 root, or `/`, directory)

3. Then go down to the `etc` directory

4. Finally, go to the `X11` directory

Conversely, using an absolute path would get you to the `/etc/X11` directory more quickly. For example:

```
cd /etc/X11
```

Note

Always make sure you know which working directory you are in before you state the relative path to the directory or file you want to get to. You do not have to worry about your position in the file system, though, when you state the absolute path to another directory or file. If you are not sure, type `pwd`.

Command	Function
`cd`	returns you to your login directory
`cd ~`	also returns you to your login directory

Command	Function
`cd /`	takes you to the entire system's root directory
`cd /root`	takes you to the home directory of the root, or superuser, account created at installation
`cd /home`	takes you to the home directory, where user login directories are usually stored
`cd ..`	moves you up one directory
`cd ~otheruser`	takes you to *otheruser's* login directory, if *otheruser* has granted you permission
`cd /dir1/subdirfoo`	regardless of which directory you are in, this absolute path would take you straight to `subdirfoo`, a subdirectory of `dir1`
`cd ../../dir3/X11`	this relative path would take you up two directories to root, then to dir3, then to the X11 directory.

Table 11-1. `cd` Options

Now that you are starting to understand how to change directories, see what happens when you change to root's login directory (the superuser account). Type:

```
cd /root
```

If you are not logged in as root, you are *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 11.14.

To change to the root login and root directory, use the `su` command. For example:

```
[sam@halloween sam]$su
Password:your root password
[root@halloween sam]#cd /root
[root@halloween /root]#
```

◈**Tip**

> The command `su` means substitute users and it allows you to 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 (your user's home directory). Typing `su -` makes you become root with root's login shell — that is, it is as if you had logged in as root originally.

As soon as you give the root password, you will 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 the prior example).

When you are done working as root, type `exit` at the prompt and you will return to your user account.

```
[root@halloween /root]#exit
exit
[sam@halloween sam]$
```

11.5. View Directory Contents with ls

Now that you know how to change directories, it is time to learn how to view the contents of these directories. Using the `ls` command, you can display the contents of your current directory.

Many options are available with the `ls` command. The `ls` command, by itself, will not show you all the files in your directory. Some files are hidden files (also called dot files) and can only be seen with an additional option specified to the `ls` command.

Tip

> 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, at the prompt type `man ls | col -b | lpr`.

Type the command `ls -a`. Now you will see files that begin with dots.

Figure 11-3. `ls` with the `-a` Option

Hidden files are mostly configuration files which set preferences in programs, window managers, shells, and more. The reason they are hidden is to help prevent any accidental tampering by the user. When you are searching for something in a directory, you are not usually looking for these configuration files, so keep them hidden to help avoid some screen clutter.

Viewing all the files using the `ls -a` command 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 do not have to be in the directory whose contents you want to view to use the `ls` command. For example, to see what is in the `/etc` directory from your home directory, type:

```
ls -al /etc
```

```
 File   Edit   Settings   Help
[sam@halloween etc]$ ls -al /etc | more
total 1892
drwxr-xr-x   53 root     root        4096 Mar  4 22:23 .
drwxr-xr-x   19 root     root        4096 Mar  4 11:37 ..
-rw-r--r--    1 root     root       15223 Jun 25 2001 a2ps.cfg
-rw-r--r--    1 root     root        2561 Jun 25 2001 a2ps-site.cfg
-rw-r--r--    1 root     root          46 Mar  4 11:34 adjtime
drwxr-xr-x    4 root     root        4096 Mar  3 17:50 alchemist
-rw-r--r--    1 root     root        1048 Aug 31 2001 aliases
-rw-r--r--    1 root     root       12288 Mar  4 11:37 aliases.db
drwxr-xr-x    3 amanda   disk        4096 Mar  3 18:13 amanda
-rw-r--r--    1 amanda   disk           0 Jul 13 2001 amandates
-rw-r--r--    1 root     root         370 Jun 24 2001 anacrontab
-rw-------    1 root     root           1 Jan 17 12:34 at.deny
-rw-r--r--    1 root     root         116 Mar  4 11:34 .aumixrc
-rw-r--r--    1 root     root         212 Aug 29 2001 auto.master
-rw-r--r--    1 root     root         575 Aug 29 2001 auto.misc
-rw-r--r--    1 root     root        1229 May 21 2001 bashrc
-rw-r--r--    1 root     root         756 Aug  8 2001 cdrecord.conf
drwxr-xr-x    2 root     root        4096 Mar  3 17:58 cipe
drwxr-xr-x    3 root     root        4096 Sep  5 2001 CORBA
drwxr-xr-x    2 root     root        4096 Jun 24 2001 cron.d
drwxr-xr-x    2 root     root        4096 Mar  4 22:13 cron.daily
--More--
```

Figure 11-4. Sample `ls` Output for the `/etc` Directory

Here is a short list of some popular options to use 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 (see Section 11.10) and I/O redirections2-managing-io (see Section 11.11.4), you will discover that there are other ways to view the contents of a directory.

11.6. Locating Files and Directories

There will be times when you know a file or directory exists but you will not know where to find it. Searching for a file or directory can be easier with the `locate` command.

With `locate`, you will see every file or directory whose name contains the search criterion. For example, if you want to search for all files with the word `finger` in the name, type:

```
locate finger
```

The `locate` command uses a database to locate files and directories that have the word `finger` in the file or directory name. The search results could include a file called `finger.txt`, a file called `pointerfinger.txt`, a directory named `fingerthumbnails`, and so on.

Tip

> To learn more about `locate`, read the `locate` man page (type `man locate` at a shell prompt).

The `locate` command works very quickly, as long as the database is up to date. That database is auto-matically 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.

Tip

Cron is a *daemon* that executes tasks at regularly scheduled intervals. To read the `cron` man page, type `man cron` at the shell prompt.

Cron periodically updates the `slocate` database, which is used to catalog file location. Switching between operating systems and shutting down your machine at the end of the day can interfere with this automatic database update.

To update the database manually, log in as root (type `su` at a shell prompt and then your root password) and type the command `updatedb`.

After a few minutes, the `slocate` database that is used by the `locate` command will be current.

Note

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 are not running 24 hours a day, to control daily, weekly, and monthly jobs that are usually controlled by `cron`.

Read the man page on `anacron` (type `man anacron` at the command line) for more information.

11.7. Printing From The Command Line

Printing is not an involved process whether you click on a button in a GUI or type commands from the command line. This section explains how to print, cancel, and view print jobs from the command line, assuming you have a properly configured printer connected to your system.

The `lpr` command, followed by a filename, sends that specified file to the print queue. For example, `lpr foo.txt` prints the `foo.txt` file.

To view the jobs waiting in the print queue, type `lpq` at the command line. Type `lpq`, and you will see information similar to this:

```
active root  389  foo.txt
```

In this example, `389` is the job number.

You can cancel jobs in the queue by typing `lprm` followed by the print job number displayed when you use the `lpq` command. To cancel this print job, type `lprm 389` and press [Enter].

11.8. Clearing and Resetting the Terminal

After even one `ls` command in a shell prompt, the terminal window you are working in can begin to look crowded. You can always exit from the terminal window and open a new one, but there is a quicker and easier way to clear the contents displayed in the terminal.

Try typing the command `clear` at the shell prompt. The `clear` command does just what it implies: it clears the terminal window.

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 are typing does not match the output on the monitor.

In such cases, type `reset` to return the terminal window to its default values.

11.9. Manipulating 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`. If the file is fairly long, it will quickly scroll past you on the screen. To prevent this, use the `cat filename.txt | less` command.

Using the pipe (|) and the `less` command displays the file one page at a time. You can then use the left and right arrow keys to move back and forth through the pages. For more on pipes, see Section 11.10.

11.9.1. Using Redirection

Redirection means causing the shell to change what it considers to be standard input or where the standard output should be going.
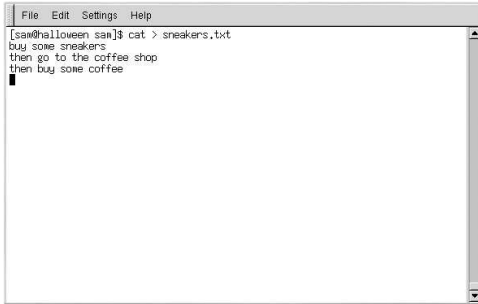
To redirect standard output, use the > symbol. Placing > after the `cat` command (or after any utility or application that writes to standard output) will direct its output to the filename following the symbol.

For example, using `cat` by itself simply outputs whatever you input to the screen as if it were repeating the line you just typed. The following example shows `cat` repeating every line that is entered:

```
[sam@halloween sam]$cat
buy some sneakers
buy some sneakers
then go to the coffee shop
then go to the coffee shop
then buy some coffee
then buy some coffee
```

To redirect `cat` output to a file, type the following at a shell prompt (pressing the [Enter] key takes you to the next blank line):

```
[sam@halloween sam]$cat > sneakers.txt
buy some sneakers
then go to the coffee shop
then buy some coffee
```

Figure 11-5. Redirecting Output to a File

Press [Enter] to go to an empty line and use the [Ctrl]-[D] keys to quit `cat`.

Notice the difference (see Figure 11-5)? There are no repeated entries. That is because the standard output from cat was redirected. That redirection was to a brand new file you made called `sneak-ers.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).

As you learned earlier, you can then use `cat` to read the file. At the prompt, type:

cat sneakers.txt

🖐**Caution**

> 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 are creating does not match the name of a pre-existing file, unless you want to replace it.

Use output redirection again for another file and call it `home.txt`. For this example, type the following:

```
[sam@halloween sam]$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] key combination again to quit `cat`.

Next, use `cat` to join `home.txt` with `sneakers.txt` and redirect the output of both files to a brand new file called `saturday.txt` (you will find an example in Figure 11-6). Type the following:

```
[sam@halloween sam]$cat sneakers.txt home.txt > saturday.txt
```

```
 File  Edit  Settings  Help
[sam@halloween sam]$ cat sneakers.txt home.txt > saturday.txt
[sam@halloween sam]$ cat saturday.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!
[sam@halloween sam]$ ▮
```

Figure 11-6. Joining Files and Redirecting Output

You can see that `cat` has added `home.txt` where `sneakers.txt` ended.

11.9.2. 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 are *adding* information, rather than replacing it.

The best explanation is a demonstration. 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 using the command `cat sneakers.txt`. The final output shows the contents of `home.txt` at the end of the file.

```
[sam@halloween sam]$cat sneakers.txt
buy some sneakers
then go to the coffee shop
then buy some coffee
bring the coffee home
take off shoes
put on sneakers
make some coffee
relax!
[sam@halloween sam]$
```

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 time (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.txt` now, and you will see that they are identical. To make your comparison, type:

cat sneakers.txt; cat saturday.txt

The contents of both files will be displayed — first `sneakers.txt`, then `saturday.txt` (as shown in Figure 11-7).

```
  File  Edit  Settings  Help
[sam@halloween sam]$ cat sneakers.txt; cat saturday.txt
buy some sneakers
then go to the coffee shop
then buy some coffee
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!
[sam@halloween sam]$
```

Figure 11-7. Stringing Commands and Comparing Files

11.9.3. 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 are telling the shell that you want a file to be read as input for a command.

Use a file you have 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.

11.10. Pipes and Pagers

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 scroll 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.

```
ls -al /etc | less
```

Now we can view the contents of one /etc screen at a time. To move forward a screen, press [Space]; to move back a screen, press [b]; to quit, press [q]. You can use the [left] and [right] arrow keys to navigate as well.

Tip

> To read startup messages more closely, at a shell prompt, type `dmesg | less`. You will be able to
> read the file one screen at a time. To move forward, press the [Spacebar]; to quit, press [Q].

Pipes can also be used to print only certain lines from a file. 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 11.11.3).

11.10.1. 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 backward and forward.

List the contents of the `/etc` directory using `ls` and `more`.

```
ls -al /etc | more
```


Figure 11-8. Piping Output of `ls` to `more`

Use the [Spacebar] to move forward through the pages. Press [q] to exit.

11.11. More Commands for Reading Text Files

You have already been introduced to several basic shell prompt commands for reading files in text
editors. Here are a few more.

11.11.1. The head Command

You can use the `head` command to look at the beginning of a file. The command is:

```
head <filename>
```

head can be a useful command, but because it is limited to the first several lines, you will not see how long the file actually is. By default, you can only read the first ten lines of a file. You can change the number of lines displayed by specifying a number option, as shown in the following command:

```
head -20 <filename>
```

11.11.2. The tail Command

The reverse of head is tail. Using tail, you can view the last ten lines of a file.

11.11.3. 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.

Tip

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.

11.11.4. 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
```

11.11.5. Wildcards and Regular Expressions

What if you forget the name of the file you are 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.

Tip

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 is called "sneak____.txt," so type:

```
ls sneak*.txt
```

and there is the name of the file:

```
sneakers.txt
```

You will probably use the asterisk (`*`) most frequently when you are searching. The asterisk will search out everything that matches the pattern you are looking for. So even by typing:

```
ls *.txt
```

or:

```
ls sn*
```

You would find `sneakers.txt` and any other files whose names begin with `sn` or ends with `.txt`. 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 would get `sneakers.txt` as a result, and/or `sneakerz.txt`, if there were such a filename.

Regular expressions are more complex than the straightforward asterisk or question mark.

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 is when regular expressions can be useful.

Using the backslash (`\`), you can specify that you do not want to search out *everything* by using the asterisk, but you are instead looking for a file with an asterisk in the name.

If the file is called `sneak*.txt`, 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

11.12. Command History and Tab Completion

It does not take long before the thought of typing the same command over and over becomes unappealing, at best. One minor typing error can ruin lines of a command.

One solution is to use the command line history. By scrolling with the [Up Arrow] 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 11.9.1. The first time, however, at the shell prompt, type:

```
cat sneakrs.txt
```

Nothing happens, of course, because there is no `sneakrs.txt` file. No problem. We will 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.

⬦**Tip**

> 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. To read it with the `more` command, from your home directory type:

```
more .bash_history
```

To move forward a screen, press [Space]; to move back a screen, press [b]; to quit, press [q].

⬦**Tip**

> 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 11.11.3. Here is how you can quickly find a previously used command: say you are searching for a command that is similar to `cat sneak`-something. You have used the command and you think it might be in your history file. At the shell prompt, 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 sound is enabled on your system). If you get a beep, just press [Tab] again to obtain a list of the files/paths that match what has 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 will see a list of possible completions, including `updatedb` and `uptime`. By typing the partial command `upd` and pressing [Tab] again, your command is completed for you.

11.13. Using Multiple Commands

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 11-7).

Want to see how long you have been online? Just combine the date command with **Mozilla**'s command.

```
date; mozilla; date
```

Remember that commands are case sensitive, so the command to start **Mozilla** must be in lowercase to start the browser. You will see something like this:

```
[sam@halloween sam]$date; mozilla; date
Mon Feb 7 13:26:27 EST 2000
```

A second date entry appears when you close out of **Mozilla**.

```
[sam@halloween sam]$date; mozilla; date
Mon Feb 7 13:26:27 EST 2000
Mon Feb 7 14:28:32 EST 2000
[sam@halloween sam]$
```

The discrepancy between the two results from the date command shows that you were using **Mozilla** for just over an hour.

11.14. Ownership and Permissions

Earlier in this chapter, when you tried to cd to root's login directory, you received the following message:

```
[sam@halloween sam]$cd /root
bash: /root: Permission denied
[sam@halloween sam]$
```

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 malicious tampering.

One way to gain entry when you are denied permission is to su to root, as you learned earlier. This is because whoever knows the root password has complete access.

```
[sam@halloween sam]$su
Password: your root password
[root@localhost sam]#cd /root
[root@localhost /root]#
```

But switching to superuser is not always convenient, or wise, since it is 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 11.9.1) in your login directory, so sneakers.txt "belongs" to you.

That means you can specify who is allowed to read the file, write to the file, or (if it is 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, 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 11-9).

```
[sam@halloween sam]$ls -l sneakers.txt
-rw-rw-r--    1 sam sam     150 Mar 19 08:08 sneakers.txt
```

There is 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 (sam), and to which group the owner belongs (sam). Remember that, by default, the name of your group is the same as your login name.

Figure 11-9. Permissions for `sneakers.txt`

Other information to the right of the group includes file size, date and time of file creation, and file name.

The first column 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.

```
-rw-rw-r--
```

Those three sets are: the owner of the file, the group in which the file belongs, and "others," meaning users and groups not yet specified.

```
-     (rw-)   (rw-)   (r--) 1 sam sam
|      |       |        |
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 will see one of the following:

- `r` — file can be read
- `w` — file can be written to
- `x` — file can be executed (if it is a program)

When you see a dash in owner, group, or others, it means that particular permission has not been granted. Look again at the first column of `sneakers.txt` and identify its permissions.

```
[sam@halloween sam]$ls -l sneakers.txt
-rw-rw-r--    1 sam sam     150 Mar 19 08:08 sneakers.txt
[sam@halloween sam]$
```

The file's owner (in this case, sam) has permission to read and write to the file. The group, sam, has permission to read and write to `sneakers.txt`, as well. It is not a program, so neither the owner or the group has permission to execute it.

11.14.1. The chmod Command

Use the `chmod` command to change permissions easily. This example shows how to 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 sam sam      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--`).

Caution

> Remember that file permissions are a security feature. Whenever you allow anyone else to read, write to, and execute files, you are increasing the risk of files being tampered with, altered, or deleted. As a rule, 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 will have to change the "others" section of the file permissions.

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 sam sam      150 Mar 19 08:08 sneakers.txt
```

Now, type the following:

```
chmod o+w sneakers.txt
```

The `o+w` command tells the system you want to give others write permission to the file `sneakers.txt`. To check the results, list the file's details again. Now, the file looks like this:

```
-rw-rw-rw-    1 sam sam      150 Mar 19 08:08 sneakers.txt
```

Now, everyone can read and write to the file (Figure 11-10).

```
 File  Edit  Settings  Help
[sam@halloween sam]$ ls -l sneakers.txt
-rw-rw-r--   1 sam    sam        66 Mar 14 17:30 sneakers.txt
[sam@halloween sam]$ chmod o+w sneakers.txt
[sam@halloween sam]$ ls -l sneakers.txt
-rw-rw-rw-   1 sam    sam        66 Mar 14 17:30 sneakers.txt
[sam@halloween sam]$
```

Figure 11-10. Changing Permissions for `sneakers.txt`

To remove read and write permissions from sneakers.txt use the chmod command to take away both the read and write permissions.

```
chmod go-rw 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.

The result will look like this:

```
-rw-------    1 sam sam    150 Mar 19 08:08 sneakers.txt
```

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 is a list of what the shorthand represents:

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)

Permissions

  r — read access

  w — write access

  x — execute access

Actions

  + — adds the permission

  - — removes the permission

  = — makes it the only permission

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:

```
[sam@halloween sam]$ cat sneakers.txt
cat: sneakers.txt: Permission denied
[sam@halloween sam]$
```

Removing all permissions, including your own, successfully locked the file. But since the file belongs to you, you can always change its permissions back (see Figure 11-11).

```
[sam@halloween sam]$ chmod u+rw sneakers.txt
[sam@halloween sam]$ 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!
[sam@halloween sam]$
```
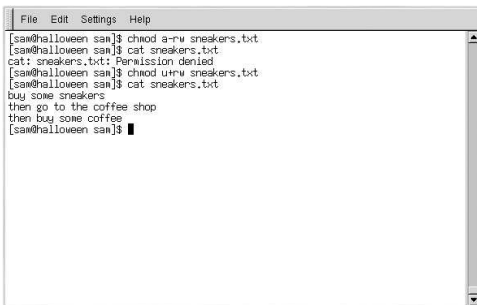

Figure 11-11. Removing and Restoring Permissions

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 not really "execute" a directory as you would an application, when you add or remove execute permission for a directory, you are really allowing (or denying) permission to search through that directory.

To allow everyone read and write access to every file in the example directory tigger, type:

```
chmod -R a+rw tigger
```

If you do not allow others to have execute permission to `tigger`, it will not matter who has read or write access. 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 is what happens now when you try to `cd` to into `tigger`:

```
[sam@halloween sam]$cd tigger
bash: tigger: Permission denied
[sam@halloween sam]$
```

Next, restore your own and your group's access.

```
chmod ug+x tigger
```

Now, if you check your work with `ls -dl` you will see that only others will be denied access to the `tigger` directory.

11.14.2. Changing Permissions With Numbers

Remember the reference to the shorthand method of `chmod`? Here is another way to change permissions, although 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 sam sam     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 example, if you want read and write permissions, you would have a value of 6; 4 (read) + 2 (write) = 6.

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 is read as `664`.

If you want to change `sneakers.txt` so those in your group will not have write access, but can still read the file, remove the access by subtracting two (2) from that set of numbers.

The numerical values, then, would become six, four, and four (644).

To implement these new settings, type:

```
chmod 644 sneakers.txt
```

Now verify the changes by listing the file. Type:

```
ls -l
      sneakers.txt
```

The output should be:

```
-rw-r--r--    1 sam sam      150 Mar 19 08:08 sneakers.txt
```

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 will allow everyone to read and write to a file or directory. Setting permissions to 777 allows everyone read, write, and execute permission. These permissions could allow tampering with sensitive files, so in general, it is not a good idea to use these settings.

Here is 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 have 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 have only read and execute.

*   -rwx--x--x (711) — The owner has read, write and execute permissions; the group and others have 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.

Chapter 12.

Managing Files and Directories

The GNOME file manager **Nautilus** and the KDE file manager **Konqueror** are powerful and important tools for managing files and directories. They are discussed in Chapter 2 and Chapter 3, respectively. This chapter discusses the shell prompt commands that can be used to manage files and directories on your Red Hat Linux system as well as how to view PDF files.

Note

Due to system security, unless you are root, you will not be able to gain access to all system-level files and directories. If you do not have the permission to open, delete, or execute a file, you will receive an error message saying your access is denied. This is normal behavior.

12.1. A Larger Picture of the File System

Every operating system has a method of storing data in files and directories so that it can keep track of additions, modifications, and other changes.

In Linux, every file is stored in a directory. Directories can also contain directories; these *subdirectories* can also contain files and other subdirectories.

You might think of the file 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 and directories of their own.

There would not be a tree without a root, and the same is true for the Linux file system. No matter how far away the directories branch, everything is connected to the root directory, which is represented as a single forward slash (/).

Tip

Red Hat Linux uses the term *root* in several different ways, which might be confusing to new users. There is the root account (the superuser, who has permission to do anything), the root account's home directory (/root) and the root directory for the entire file system (/). When you are speaking to someone and using the term *root*, be sure you know which root you are talking about.

Unless you are a system administrator, you probably do not have permission to write to the files and directories outside of your home directory. Certain directories are reserved for specific purposes. For example, /home is the default location for users' home directories.

Users that are not system administrators might find the following directories useful:

- /home — Default location for users' home directories. For example, a user with the username foo has the home directory /home/foo.
- /usr/share/doc — Location of documentation for installed packages. For example, the documentation for the dateconfig software package is located in /usr/share/doc/dateconfig-<version-number>.

- /tmp — Reserved directory for all users to store temporary files. Files stored here are not permanent. A system process removes old files from this directory on a periodic basis. Do not write any files or directories that you want to keep here.

Your Red Hat Linux system is compatible with many other Linux distributions 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 learn more about the FHS, refer to the *Official Red Hat Linux Reference Guide Reference Guide*. You can also visit the FHS website: http://www.pathname.com/fhs.

12.2. Identifying and Working with File Types

If you are new to Linux, you may see files with extensions you do not 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 is a brief listing of file extensions and their meanings:

12.2.1. Compressed and Archived Files

- .bz2 — a file compressed with bzip2
- .gz — a file compressed with gzip
- .tar — a file archived with tar (short for *tape archive*), also known as a *tar file*
- .tbz — a tarred and bzipped file
- .tgz — a tarred and gzipped file.

For information on working with bzip2, gzip, and tar files, refer to Section 12.3.

12.2.2. File Formats

- .au — an audio file
- .gif — a GIF image file
- .html/.htm — an HTML file
- .jpg — a JPEG image file
- .pdf — an electronic image of a document
- .png — a PNG image file
- .ps — a PostScript file; formatted for printing
- .txt — a plain ASCII text file
- .wav — an audio file
- .xpm — an image file

12.2.3. System Files

- `.conf` — a configuration file
- `.lock` — a *lock* file; determines whether a program or device is in use
- `.rpm` — a Red Hat Package Manager file used to install software

12.2.4. Programming and Scripting Files

- `.c` — a C program language source code file
- `.cpp` — a C++ program language source code file
- `.h` — a C or C++ program language header file
- `.o` — a program object file
- `.pl` — a Perl script
- `.so` — a library file
- `.tcl` — a TCL script

But file extensions are not always used, or used consistently. So what happens when a file does not have an extension, or the file does not seem to be what the extension says it is supposed to be?

That is when the `file` command can be helpful.

For instance, you find a file called `saturday` without an extension. Using the `file` command, you can tell what type of file it is by typing:

```
file saturday
```

It will display `ASCII text`, telling you it is a text file. Any file that is designated a text file should be readable using the `cat`, `more`, or `less` commands.

Tip

To learn more about `file`, read the man page by typing `man file`.

For more information on helpful commands for reading files, see Chapter 11.

12.3. File Compression and Archiving

Sometimes it is useful to store a group of files in one file so that they can be backed up, easily transferred to another directory, or even transferred to a different computer. It is also sometimes useful to compress files into one file so that they use less disk space and download faster.

It is important to understand the difference and relationship between an *archive file* and a *compressed file*. An archive file is a collection of files and directories that are stored in one file. The archive file is not compressed — it uses the same amount of disk space as all the individual files and directories combined. A compressed file is a collection of files and directories that are stored in one file *and* stored in a way that uses less disk space than all the individual files and directories combined. If you do not have enough disk space on your computer, you can compress files that you do not use very

often or files that you want to save but do not use anymore. You can even create an archive file and then compress it to save disk space.

Important

An archive file is not compressed, but a compressed file can be an archive file.

12.3.1. File Compressing

Compressed files use less disk space and download faster than large, uncompressed files. In Red Hat Linux you can compress files with the compression tools `gzip`, `bzip2`, or `zip`.

The `bzip2` compression tool is recommended because it provides the most compression and is found on most UNIX-like operating systems. The `gzip` compression tool can also be found on most UNIX-like operating systems. If you need to transfer files between Linux and other operating system such as MS Windows, you should use `zip` because it is more commonly used on these other operating systems.

Compression Tool	File Extension	Uncompression Tool
gzip	.gz	gunzip
bzip2	.bz2	bunzip2
zip	.zip	unzip

Table 12-1. Compression Tools

By convention, files compressed with `gzip` are given the extension `.gz`, files compressed with `bzip2` are given the extension `.bz2`, and files compressed with `zip` are given the extension `.zip`.

Files compressed with `gzip` are uncompressed with `gunzip`, files compressed with `bzip2` are uncompressed with `bunzip2`, and files compressed with `zip` are uncompressed with `unzip`.

12.3.1.1. Bzip2 and Bunzip2

To use `bzip2` to compress a file type the following command at a shell prompt:

```
bzip2 filename
```

The file will be compressed and saved as `filename.bz2`.

To expand the compressed file, type the following command:

```
bunzip2 filename.bz2
```

The `filename.bz2` is deleted and replaced with `filename`.

You can `bzip2` multiple files and directories at the same time by listing them with a space between each one:

```
bzip2 filename.bz2 file1 file2 file3 /usr/work/school
```

The above command compresses `file1`, `file2`, `file3`, and the contents of the `/usr/work/school` directory (assuming this directory exists) and put them in `filename.bz2`.

⬦**Tip**

> For more information, type `man bzip2` and `man bunzip2` at a shell prompt to read the man pages for `bzip2` and `bunzip2`.

12.3.1.2. Gzip and Gunzip

To use `gzip` to compress a file, type the following command at a shell prompt:

```
gzip filename
```

The file will be compressed and saved as `filename.gz`.

To expand the compressed file, type the following command:

```
gunzip filename.gz
```

The `filename.gz` is deleted and replaced with `filename`.

You can `gzip` multiple files and directories at the same time by listing them with a space between each one:

```
gzip -r filename.gz file1 file2 file3 /usr/work/school
```

The above command compresses `file1`, `file2`, `file3`, and the contents of the `/usr/work/school` directory (assuming this directory exists) and put them in `filename.gz`.

⬦**Tip**

> For more information, type `man gzip` and `man gunzip` at a shell prompt to read the man pages for `gzip` and `gunzip`.

12.3.1.3. Zip and Unzip

To compress a file with `zip`, type the following command:

```
zip -r filename.zip filesdir
```

In this example, `filename.zip` represents the file you are creating and `filesdir` represents the directory you want to put in the new zip file. The `-r` option specifies that you want to include all files contained in the `filesdir` directory *recursively*.

To extract the contents of a `zip` file, type the following command:

```
unzip filename.zip
```

You can `zip` multiple files and directories at the same time by listing them with a space between each one:

```
zip -r filename.zip file1 file2 file3 /usr/work/school
```

The above command compresses `file1`, `file2`, `file3`, and the contents of the `/usr/work/school` directory (assuming this directory exists) and put them in `filename.zip`.

◈
Tip

For more information, type `man zip` and `man unzip` at a shell prompt to read the man pages for `zip` and `unzip`.

12.3.2. File Archiving

A `tar` file is a collection of several files and/or directories in one file. This is a good way to create backups and archives.

Some of the options used with the `tar` are:

- `-c` — create a new archive.
- `-f` — when used with the `-c` option, use the filename specified for the creation of the `tar` file; when used with the `-x` option, unarchive the specified file.
- `-t` — show the list of files in the `tar` file.
- -v — show the progress of the files being archived.
- -x — extract files from an archive.
- -z — compress the `tar` file with `gzip`.
- -j — compress the `tar` file with `bzip2`.

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 archived file.

You can `tar` multiple files and directories at the same time by listing them with a space between each one:

```
tar -cvf filename.tar /home/mine/work /home/mine/school
```

The above command would place all the files in the `work` and the `school` subdirectories of `/home/mine` in a new file called `filename.tar` in the current directory.

To list the contents of a tar file, type:

```
tar -tvf filename.tar
```

To extract the contents of a tar file, type:

```
tar -xvf filename.tar
```

This command does not remove the `tar` file, but it places copies of its contents in the current working directory.

Remember, the `tar` command does not compress the files by default. To create a tarred and bzipped compressed file, use the `-j` option:

```
tar -cjvf filename.tbz
```

`tar` files compressed with `bzip2` are conventionally given the extension `.tbz`.

This command creates an archive file and then compresses it as the file `filename.tbz`. If you un-compress the `filename.tbz` file with the `bunzip2` command, the `filename.tbz` file is removed and replaced with `filename.tar`.

You can also expand and unarchive a `bzip tar` file in one command:

```
tar -xjvf filename.tbz
```

To create a tarred and gunzipped compressed file, use the `-z` option:

```
tar -czvf filename.tgz
```

`tar` files compressed with `gzip` are conventionally given the extension `.tgz`.

This command creates the archive file `filename.tar` and then compresses it as the file `file-name.tgz`. (The file `filename.tar` is not saved.) If you uncompress the `filename.tgz` file with the `gunzip` command, the `filename.tgz` file is removed and replaced with `filename.tar`.

You can expand a `gzip tar` file in one command:

```
tar -xzvf filename.tgz
```

Tip

Type the command `man tar` to read the man page for the `tar` command.

12.4. Manipulating Files at a Shell Prompt

Files can be manipulated quite easily using one of the graphical managers such as **Nautilus** and **Konqueror**. They can also be manipulated using a shell prompt; this is often faster. This section explains how.

12.4.1. Creating Files

You can create new files either with applications (such as text editors) or by using the command `touch`, which will create an empty file that you can use to add text or data. To create a file with `touch`, type the following at a shell prompt:

```
touch <filename>
```

replacing <*filename*> with the name of your choice. You will see if you run a directory listing that the file contains zero (0) bytes of information because it is an empty file.

```
[sam@halloween]ls -l newfile
-rw-rw-r--   1 sam      sam                   0 Apr 10 17:09 newfile
```

12.4.2. Copying Files

Like so many other Linux features, there is a variety of ways to manipulate files and directories. You can also use wildcards, as explained in Section 11.11.5, to make the process of copying, moving, or deleting multiple files and directories faster.

To copy a file, type the following command:

```
cp <source> <destination>
```

replacing <*source*> with the name of the file you want to copy, and <*destination*> with the
name of the directory where you want the file to go.

So, to copy the file sneakers.txt to the directory tigger/ in your home directory, move to your
home directory and type:

```
cp sneakers.txt tigger/
```

You can use both relative and absolute pathnames with cp. Our home directory is the parent of the
directory tigger; tigger is one directory down from our home 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 specified files and directories, this will copy the
  whole directory tree, subdirectories and all.

- −v — verbose. shows the progress of the files being copied.

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 is already there, press [Y] and then [Enter]. If you do not want to overwrite
the file, press [N] and [Enter].

12.4.3. Moving Files

To move files, use the mv command. 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 have selected will overwrite an existing file
  in the destination directory. This is a good option, because like the −i option for cp, you will 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 are 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 existing another directory, type the
following (you will 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.

12.4.4. Deleting Files and Directories

You learned about creating files with the `touch` command, 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 are doing.
- `-v` — verbose. Shows a list of files as they are being removed.
- `-r` — recursive. Will delete a directory and all files and subdirectories it contains.

To delete the file `piglet.txt` with the `rm` command:

```
rm piglet.txt
```

⚠️**Warning**

> Once a file or directory is removed with the `rm` command, it is gone permanently and cannot be returned.

Use the `-i` (interactive) option to give 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 did not 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 multiple files using the `rm` command. For example:

```
rm piglet.txt sneakers.txt
```

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
```

A safer alternative to using `rm` for removing directories is the `rmdir` command. With this command, you will not be allowed to use recursive deletions, so a directory which has files in it will not be deleted.

⚠ Warning

> The `rm` command can delete your entire file system! If you are logged in as root and you type the simple command `rm -rf /`, you are in trouble; this command will recursively remove everything on your system.

Read the `rmdir` man page (`man rmdir`) to find out more about this command.

12.5. Viewing PDFs

A PDF (Portable Document Format) file is an electronic image of a document. PDF captures formatting information from a variety of desktop publishing applications, making it possible to send formatted documents and have them appear on the recipient's monitor or printer as they were intended. To view a PDF you must have a PDF reader.

An open source application called **xpdf** is included with Red Hat Linux. To see a list of menu options, right-click inside the screen. The toolbar at the bottom has navigational tools that let you move backward and forward through the document, as well as standard zoom, print, and find tools. The **xpdf** man page provides useful information on the **xpdf** options. To view the **xpdf** man page, at shell prompt type `man xpdf`.

To view a PDF with **xpdf**:

1. In GNOME, go to **Main Menu => Programs => Graphics => xpdf**.

   In KDE, go to **Main Menu => Graphics => xpdf**.

   You can also launch **xpdf** prompt by typing `xpdf` at a shell prompt.

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**.

✎ Note

> A quick way to convert PostScript to PDF is to open a shell prompt and type:
>
> ```
> ps2pdf input.ps output.pdf
> ```
>
> Type `man ps2pdf` at a shell prompt to view the man page on the `ps2pdf` tool. This gives you information on a variety of conversion options.

Another popular PDF viewer is **Adobe Acrobat Reader**. While it is not included with Red Hat Linux, you can download it free of charge at http://www.adobe.com/.

Updating and Adding Packages to Red Hat Linux

Red Hat Linux consists of various software applications and utilities, known as *RPM packages*. A package is just a file that contains a software program.

This chapter explains three ways to update your system: using Red Hat Network, using the online Errata List, and using the Red Hat Linux Installation CD-ROMs.

13.1. Red Hat Network

Red Hat Network is an Internet solution for managing one or more Red Hat Linux systems. All Security Alerts, Bug Fix Alerts, and Enhancement Alerts (collective known as Errata Alerts) can be downloaded directly from Red Hat using the **Red Hat Update Agent** standalone application or through the RHN Web interface available at http://rhn.redhat.com/.

Red Hat Network saves users time because they receive email when updated packages are released. Users do not have to search the Web for updated packages or security alerts. By default, Red Hat Network installs the packages as well. Users do not have to learn how to use **RPM** or worry about resolving software package dependencies; RHN does it all.

Each Red Hat Network account comes with:

- Errata Alerts — learn when Security Alerts, Bug Fix Alerts, and Enhancement Alerts are issued for all the systems in your network through the Basic interface
- Automatic email notifications — receive an email notification when an Errata Alert is issued for your system
- Scheduled Errata Updates — schedule delivery of Errata Updates (with optional automatic installation)
- Package installation — Schedule package installation on one or more systems with the click of a button
- **Red Hat Update Agent** — use the **Red Hat Update Agent** to download the latest software packages for your system (with optional package installation)
- Red Hat Network website — manage multiple systems, downloaded individual packages, and schedule actions such as Errata Updates through a secure Web browser connection from any computer.

To start using Red Hat Network, follow these three basic steps:

1. Create a System Profile by running the **Red Hat Network Registration Client** (rhn_register) on the system that you want to register.
2. Log in to RHN at http://rhn.redhat.com/ and entitle the system to a service offering. Everyone receives a free Red Hat Network account for one system. Additional accounts must be purchased.
3. Start scheduling updates through the RHN website, or download and install Errata Updates using the **Red Hat Update Agent**.

For more detailed instructions, read the *Red Hat Network User Reference Guide* available at http://www.redhat.com/docs/manuals/RHNetwork/.

13.2. Errata List

It is recommended that new users use Red Hat Network to download and install/upgrade packages. Updating Errata packages from the Red Hat Linux Errata website is recommended for more experienced Red Hat Linux users. It also requires users to resolve *software dependencies* manually. A software dependency is when a package is dependent on other package being installed.

All Security Alerts, Bug Fix Alerts, and Enhancement Alerts (collective known as Errata Alerts) can also be downloaded from the Red Hat website at http://www.redhat.com/apps/support/errata/. Click on the Red Hat Linux version you are using to view a list of all available errata for Red Hat Linux. Click on the name of the Errata Alert that you want to apply to your system. Instructions for updating the packages are on the individual Errata pages. Red Hat, Inc. tests and approves the RPMs posted on this site. RPMs downloaded from other sites are not supported.

13.3. Installation CD-ROMs

Place one of the installation CDs in your CD-ROM drive. Inserting a CD in the CD-ROM drive should automatically open the file manager.

In the file manager screen, click on `/mnt/cdrom/RedHat/RPMS`. Scroll through the files on the right and look for the packages you want.

Open a terminal and login as root by typing:

```
su –
```

Next, use the `rpm` command to install the packages. The `-Uvh` options that follows the command specifies that you want to install or upgrade the package, that you want to see verbose messages, and that you want to see hash marks (#) while the package is installing. In this example, the documentation files, which all begin with `rhl`, would be installed. The string `rhl-*.rpm` tells your system to install all files that begin with `rhl` and end in `.rpm` (* is a wildcard and keeps you from having to type out each of the long file names manually). In place of `rhl` you should put whatever comes before the first hyphen in the name of the package you want to install.

```
rpm –Uvh rhl-*.rpm
```

Press [Enter]. Type **exit** at the command line and press [Enter] again. This takes you out of the root login and back to your user account.

Now that the package is installed, it should appear in the appropriate place in the panel's main menu.

Refer to the *Official Red Hat Linux Customization Guide* for more information about **RPM**.

Chapter 14.

Frequently Asked Questions

This chapter answers some of the most common questions about using Red Hat Linux that you may ask as you become more familiar with it. From changing your desktop screen size to troubleshooting package installation problems, this chapter will ease you step-by-step through some common tasks and get you on your way.

14.1. Localhost Login and Password

I have installed Red Hat Linux. After rebooting, I get a message telling me it needs a localhost login and password. What are these?

Unless you specified a host name for your computer, or received that information from a network, your Red Hat Linux installation will call your machine localhost.localdomain by default.

When you get to that initial prompt, it is asking you to log in to your system. If you created a user account during installation, you can log in using that user name and password. If you didn't create a user account during installation, then you can log in as the super user, also known as **root**. The root password is the system password you assigned during installation.

It is highly recommended that you create at least one user account during installation. If you did not, you can create a new user with the **Red Hat User Manager** GUI application or the useradd command-line utility. For more information, refer to Section 1.5.

14.2. Displaying ls in color

How do I get ls *to display in color?*

By default, the GUI terminals and console shell prompt display files in various contextual colors. However, you may have to add color to the ls command if, for example you are logged into a machine that does not support colored directory listings by default. If this is the case, just include the --color option. For example:

```
ls -al --color /etc
```

Some users feel that adding --color does more than add a splash of color; it gives a clue about the types of files in a directory. For example, directories might all be a royal blue, program files would be green, and so on.

Displaying the listing in color all the time involves a little more work. You will need to add one line to the .bashrc file in your home directory. The .bashrc file is used by your shell when you login. Make sure you are in your /home/login directory and copy the .bashrc file, keeping it in the same directory, but with a name like .bashrc2.

```
cp .bashrc .bashrc2
```

If you make a mistake or have trouble, you can replace your .bashrc file by typing:

```
cp .bashrc2 .bashrc
```

at the shell prompt.

Open the .bashrc file with your favorite text editor. For example, you could type **pico .bashrc** at the command line to open the file. You should see something like this:

```
# .bashrc

# User specific aliases and functions

# Source global definitions
if [ -f /etc/bashrc ]; then
        . /etc/bashrc
fi
```

Under the line `# User specific aliases and functions` type:

`alias ls="ls -al --color"`

Make sure to write your changes to the file and save them. To make the change work immediately, run the `source` command to the `.bashrc` file with the following command:

```
source .bashrc
```

14.3. Error Messages During Installation of RPMs

How do I install an RPM from a CD or the Internet? I keep getting an error message when I use **Gnome-RPM**.

If you are getting an error message similar to `failed to open /var/lib/rpm/packages.rpm`, it is because you do not have proper permission to install RPM files.

When you install software, you are often required to make system-wide changes which only root can make, such as creating new directories outside of your user home directory or making changes to your system configuration. If you are using your normal user account, you will not have permission to make such changes by default.

You need to be the root user in order to install RPM files. At a shell or GUI terminal prompt, switch to root user by running the following:

```
su
```

You should then be able to install the RPM file without further errors. For more information about using RPM and **Gnome-RPM**, refer to the *Official Red Hat Linux Customization Guide* on the Red Hat Linux Documentation CD or online at http://www.redhat.com/docs/.

14.4. Starting Applications

I installed an application I downloaded from the Internet, 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 will it not it start?

If you are trying to start an application from the shell prompt and it is not working, try adding **`./`** before the name of the application's executable.

For example, imagine that you have downloaded the **`setiathome`** client application 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
```

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 user shell environment knew it could be found (such as `/usr/bin`).

In such instances, you have to change into the directory which holds the executable and start the application from there. That means you will have to tell your shell where it can find the executable; adding `./` tells your user shell that 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. To do this, you will have to edit your PATH variables.

14.4.1. Editing Your PATH

If you frequently start programs that are not located in a directory that your user shell has configured by default, you will have to edit your user shell configuration file to add the directory containing the executable you wish to run. You can do this by adding the directory to your PATH environment variable.

Caution

These instructions are intended *only* for user accounts. Avoid modifying files such as the root user'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 will 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/:/home/user/directory/
```

Replace *user* with your user name and *directory* with the directory containing the executable you wish to run.

Now, type [Ctrl]-[x]; you will be asked whether you want to save "the modified buffer" (that's what **Pico** calls an updated file); type [y] for "yes." Next, you will see the name the file will be saved as; press the [Enter] key.

You can then make the changes to `.bash_profile` take effect immediately by typing the following command:

```
source .bash_profile
```

By doing the above, you do not have to manually add `./` to the beginning of the executable to start an application located in the directory you've added to your PATH.

14.5. Accessing a 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 am running Linux?

You can access another partition on your system (for example, a Windows partition), in two different ways.

First, 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/windows

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/windows
```

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/windows

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/windows 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, refer the man page by typing **man mount** at a shell prompt.

To access the partition, type `cd /mnt/windows`. To navigate through Windows 98's "long filename" directories, surround the directory in quotation marks, as in `ls "Program Files"`.

14.6. Finding Commands Quickly

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?

The command you used will most likely be 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 too quickly for your to read ever line.

Another way to view `.bash_history` is with a utility 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] bar; 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.

Say you were reading the man page the day before, but cannot recall its name. To search for the command, type:

```
history | grep man
```

You will 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 14.8.

14.7. Keep ls Output from Scrolling

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?*

To prevent the output of ls from scrolling by too quickly, pipe the output to a utility such as less or more. You will then be able to see the output one screen, or "page" at at 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] bar; to move back a screen, press the [b] key; to quit, press [q].

You can achieve the same results with more, another paging utility.

14.7.1. Printing ls Output

You can also print directory listings by piping the output to a printer in the same way that you piped the output to your screen. If you have configured a printer, type the following to pipe the output of a command to the printer:

```
ls -al /etc | lpr
```

14.8. Tips on Using Command History

What are some other ways I can use command history?

If you type **history**, you will see a numbered list scroll by very quickly, showing you the previous 500 commands you have used.

You probably do not 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 typed will display (you can use any quantity as an argument of the history command).

14.8.1. 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 or GUI terminal 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.

14.9. Forgotten Password

Help! I forgot my root password. How do I log in now?

You can log in using single-user linux mode and create a new root password.

To enter Linux single-user mode, reboot your computer. If you use the default bootloader, **GRUB**, you can enter single user mode by performing the following:

1. At the bootloader menu, type [e] to enter into editing mode.

2. You will be presented with a boot entry listing. Look for the line that looks similar to the following:
   ```
   kernel /vmlinuz-2.4.18-0.4 ro root=/dev/hda2
   ```
   Press the arrow key until this line is highlighted and press [e].

3. You can now add **single** to the end of the text to tell GRUB to boot into single-user Linux mode. Press [Enter] to make the editing change take effect.

4. You will be brought back to the edit mode screen. From here, press [b] and GRUB will boot single-user Linux mode. After it finishes loading, you will be presented with a shell prompt similar to the following:
   ```
   sh-2.05#
   ```

5. You can now change the root password by typing
   ```
   bash# passwd root
   ```
   You will be asked to re-type the password for verification. Once you are finished, the password will be changed and you can reboot by typing `reboot` at the prompt; then you can log in to root as you normally would.

14.10. Password Maintenance

I forgot or want to change my user account password.

Open a shell prompt and log in as root (**su –** and root password when prompted). As root, type the following:

```
passwd username
```

Replace `username` with your normal user name.

The `passwd` will then ask for the new password, which you will need to enter twice. You can now use the new password to log in to your user account.

14.11. Changing Login from Console to X at Startup

How do I change my login from the console to the graphical screen?

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 are finished, log out and, the next time you log in, you will have a graphical login prompt.

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 will 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 are satisfied with your change, save and exit the file using the [Ctrl]-[x] keys. You will see
a message telling you that the file has been modified, and asking you to confirm your change. Type
[Y] for yes.

Now, your next login will be from the graphical screen.

14.12. Configuring X

Everything on my desktop looks tiny. How do I change my screen resolution?

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 14-1.

💡**Tip**

You can start **Xconfigurator** in two other ways, both of which give you access to additional configu-
ration 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 14-1. The Opening Dialog of XConfigurator

To navigate and make selections, use the [Tab] key. When your selection is highlighted, press the [Enter] key.

Note

Make certain that your monitor and graphics card are supported for Red Hat Linux. To check, visit the Hardware Compatibility List at http://hardware.redhat.com.

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 14-2. Click the **Ok** button to proceed.

Figure 14-2. Results of Video Card Probe

Next, pick your exact monitor make and model number, as in Figure 14-3. You can often find the make and model number on the front or back of your monitor.
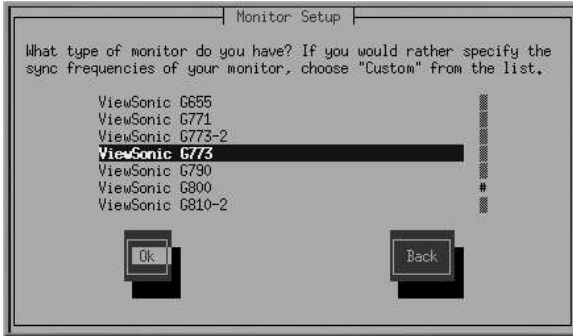
Figure 14-3. The Monitor Setup Dialog

You will 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.

Tip

> If you do not 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!* Do not 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 window appears to inform you that your card has be probed for its correct display settings. Do not worry if your monitor blinks during the process; that is normal.

You do not have to probe your video card. If you choose **No** when asked if you want to accept the settings on the **Monitor Probe** screen, 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 14-4).
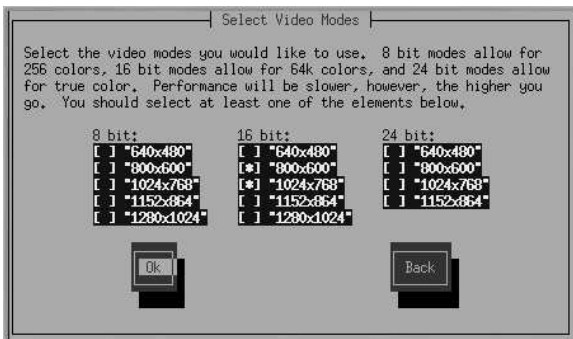
Figure 14-4. Select Video Modes

You can choose modes ranging from 8-bit to 32-bit, depending on the power of your computer and how many colors you want displayed. In each of the mode columns, you will find resolution choices listed; using your [Tab] key, position the cursor in the boxes next to your chosen resolution. Select one by pressing [Space].

Tip

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 are 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 in the /etc/X11 directory.

Now, log out, then log in again to your new screen resolution.

Appendix A.

Applications

The following table shows some of the Red Hat Linux applications that are available to handle many popular tasks. *This is not a complete list of all applications available.*

Most of these applications can be used in both GNOME and KDE, regardless of which interface has the application listed in its main menu.

Category	Application
Word Processors	AbiWord, KWord
Spreadsheets	Gnumeric, Kspread
Presentations	Kpresenter
Charts and Diagrams	Dia, Kcharts, Kivio
Graphic Design	The GIMP, KDE Icon Editor, XFig
Image Viewers	Electric Eyes, GQview, The GIMP, KView
Scanners	The GIMP, XSane, Fax Viewer
PDAs	Jpilot, gnome-pilot, Evolution, Kpilot
Digital Cameras	gPhoto, XSane, Kamera
CD Recording	Cdecord, Gnome Toaster, X-CD-Roast
Text Editors	Emacs, vi, pico, joe, gedit, Kate, KDE Advanced Editor, KDE Text Editor, GNOME Text File Viewer
Email Clients	Mozilla Mail, Evolution, Kmail, Netscape Mail, Balsa, pine, mutt, emacs
Web Browsers	Mozilla, Netscape, Galeon, Nautilus, Konquerer, Lynx
Chat	GAIM, X-Chat IRC Client
PDF Viewers	xpdf, Ghostview, GNOME Ghostview, KDE Ghostview
Personal Finance	Gnucash
Fax	K Send a Fax
Multimedia	GNOME CD Player, GNOME Sound Recorder, Cpd, KDE CD Player, XMMS, AUmix, Audio Mixer, Midi/Karaoke Player, KDE Sound Mixer, KDE MidiSynth

Table A-1. Applications

Appendix 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.

This appendix provides common commands used at the MS-DOS prompt in Windows(tm) 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).

Command's Purpose	MS-DOS	Linux	Basic Linux Example
Copies files	copy	cp	cp *thisfile.txt /home/thisdirectory*
Moves files	move	mv	mv *thisfile.txt /home/thisdirectory*
Lists files	dir	ls	ls
Clears screen	cls	clear	clear
Closes prompt window	exit	exit	exit
Displays or sets date	date	date	date
Deletes files	del	rm	rm *thisfile.txt*
"Echoes" output on the screen	echo	echo	echo *this message*
Edits files with simple text editor	edit	pico(a)	pico *thisfile.txt*
Compares the contents of files	fc	diff	diff *file1 file2*
Finds a string of text in a file	find	grep	grep *this word or phrase thisfile.txt*
Formats a diskette	format a: (if diskette is in A:)	mke2fs or mformat(b)	/sbin/mke2fs /dev/fd0 (/dev/fd0 is the Linux equivalent of A:)
Displays command help	*command* /?	man(c)	man *command*
Creates a directory	mkdir	mkdir	mkdir *directory*
View a file	more	less(d)	less *thisfile.txt*
Renames a file	ren	mv	mv *thisfile.txt thatfile.txt*(e)

Command's Purpose	MS-DOS	Linux	Basic Linux Example
Displays your location in the file system	`chdir`	`pwd`	`pwd`
Changes directories with a specified path (*absolute path*)	`cd pathname`	`cd pathname`	`cd /directory/directory`
Changes directories with a *relative path*	`cd ..`	`cd ..`	`cd ..`
Displays the time	`time`	`date`	`date`
Shows amount of RAM and use	`mem`	`free`	`free`

Notes:
a. Pico is a simple text editor; other editors you can use in place of **Pico** include **Emacs** and **vi**.
b. This formats a disk for the DOS filesystem.
c. You can also use `info` for some commands.
d. The `more` pager can also be used to page through a file a screen at a time.
e. 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.

Table B-1. Similar Commands

Appendix C.
System Directories

This is a list of the primary Red Hat Linux system directories. Each directory is described briefly. For additional directory information, refer to the *Official Red Hat Linux Customization Guide* and *Official Red Hat Linux Reference Guide* indexes.

- /bin - Used to store user commands. The directory /usr/bin also stores user commands.
- /sbin - Location of many system commands, such as shutdown. The directory /usr/bin also contains many system commands.
- /root - The home directory of the superuser.
- /mnt - This directory typically contains the mount points for filesystems mounted after the system is booted.
- /boot - Contains the kernel and other files used during system startup.
- /lost+found - Used by fsck to place orphaned files (files without names).
- /lib - Contains many library files used by programs in /bin and /sbin. The directory /usr/bin contains more library files.
- /dev - Stores device files.
- /etc - Contains many configuration files and directories.
- /var - For "variable" files, such as log files and the printer spool.
- /usr - Contains files and directories directly relating to users of the system.
- /proc - A virtual file system (not actually stored on the disk) that contains system information used by certain programs.
- /tmp - A "scratch pad" for users and programs. /tmp has global read/write access.
- /home - Typical location of user home directories.

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Appendix D.

Keyboard Shortcuts

Here are a few keyboard shortcuts you can use to perform common tasks quickly. Many more are available in addition to what is listed here. For more command line and keyboard shortcuts, visit:

```
http://sunsite.dk/linux-newbie/Linux_commands.htm#shortcuts
```

- [Ctrl] + [Alt] + [Backspace] = kill X. Kills your current X session and returns you to the login screen. Use this if the normal exit procedure does not work.
- [Ctrl] + [Alt] + [Delete] = shutdown and reboot. Shuts down your current session and reboots the OS. Use only when the normal shutdown procedure does not work.
- [Ctrl] + [Alt] + [Fn] = switches screens. [Ctrl]+[Alt] + one of the function keys displays a new screen. [F1] through [F6] are text (console) screens and [F7] is a graphical screen.
- [Ctrl] + [Tab] = switch tasks. If you have more than one application open at a time, you can use [Alt] + [Tab] to switch among open tasks and applications.
- [Ctrl] + [a] = move cursor to the beginning of a line. This works in most text editors and in the URL field in **Mozilla**.
- [Ctrl] + [d] = logout of a terminal or console instead of having to type exit or logout.
- [Ctrl] + [e] = move cursor to end of a line. This works in most text editors and in the URL field in **Mozilla**.
- [Ctrl] + [l] = clear the terminal. This shortcut does the same thing as typing "clear" at a command line.
- [Ctrl] + [u] = clear the current line. If you are working in a terminal, use this shortcut to clear the current line from the cursor all the way to the end of the line.
- [Middle Mouse Button] = pastes highlighted material. Use the left mouse button to highlight material. Point the cursor to the spot where you want it pasted. Click the middle mouse button to paste it.
- [Tab] = command autocomplete. Use this command when working in a terminal. Type the first few characters of a command and then press the [Tab] key. It will automatically complete the command or show all the commands that match the characters you typed.
- [Up/Down Arrow] = show command history. When working in a terminal, press the [up] or [down] arrow to scroll through a history of commands you have typed from the current directory. When you see the command you want to use, press [Enter].
- `clear` = clear the terminal. Type this at a command line to clear all displayed data from the terminal window.
- `exit` = logout. Type this at a command line to logout of the current user or root account.
- `history` = show history of commands. Type this at a command line to see a numbered list of the previous 500 commands you typed. To display a shorter list of commands, by type `history` followed by a space and a number, for example, `history 20`.
- `reset` = refresh terminal screen. Type this at a command line to refresh the terminal screen if characters are unclear.

Index

Symbols