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Installing Red Hat Linux 9

Installing an operating system is often a long, drawn-out process that requires a lot of upfront planning. Installation of traditional Unix-based operating systems seems to have been particularly painful in the past, requiring even experienced administrators to fret about partitions and drivers. Early versions of Linux were no different in this respect. The first version of Linux, back in 1993, could be booted up only using Minix (another Unix-like operating system). That version of Linux could support only the Finnish keyboard because the author of Linux didn't have access to a US keyboard!

However, since then Linux has grown by leaps and bounds. Each of the major distributions has put a lot of thought and effort into the Linux installation process, and today installing Linux for desktop use is, in common talk, a no-brainer.

Red Hat, in particular, has caught the attention of the public, breaking away from the standard tradition of distributing disk images and pioneering the concept of distributing software in the form of packages. (Right now, the Red Hat Package Manager – RPM – is a standard in distribution of pre-compiled software packages in the Linux world, and we'll learn more about the RPM in Chapter 4.)

Red Hat has also been improving Linux usability and features in that most daunting area of any operating system – installation. The latest version of Red Hat Linux, version 9, is truly the most user-friendly ever, with extensive inputs from professional usability experts and a ravishing new look to attract even the most hardened of technophobes.

The Red Hat Linux distribution offers four different configurations, and your choice will depend on how you plan to use the operating system:

❑ **Personal desktop:** This configuration is targeted at users who are new to Linux, or those who like to use Linux for day-to-day applications like office productivity tools and Internet browsing. This is the option we'll install in this chapter.

- ❑ **Workstation:** This configuration is targeted at developers or system administrators. It provides various tools for software development and system management.

- ❑ **Server:** This configuration is mainly intended for systems that will not be used directly, but are primarily for offering network-based services like e-mail, file sharing, network connectivity, and web resources.

- ❑ **Custom:** This configuration is for experienced users who want more control over exactly what is installed onto their systems. The user can select which packages are to be installed and how the hard disks are to be used, and has control over various other configuration options that are pre-selected in the other three configurations.

In this chapter, we are going to take a look at getting a Personal Desktop installation in place on a new computer. We are going to look at each step of the installation and the decisions that you would have to take at various stages of the installation to get a working Red Hat desktop in place. By the end of the chapter, you will have a desktop up and running that you will be able to use right away for your daily needs like Internet browsing, e-mail, and office productivity tools.

Preparing for the Installation

While the installation process is quite straightforward, it is important that you do a little bit of preparation to ensure that the installation process goes as intended. Of course, you'll need the necessary installation disks to install the system; but it's also worth looking over your hardware too. In this section, we'll examine both software and hardware aspects of preparation.

The Software

Of course, to begin you need to have the necessary **software** for the job. The Red Hat Linux 9 distribution can be obtained from a number of sources. Here are a couple of options:

- ❑ **The Publisher's Edition CD set included with this book.** This includes all the CDs that you need for the installation process itself. In this chapter, we'll look at installation using the CDs that are included in this pack.

- ❑ **The official retail box set.** This includes all the CDs that you need for the installation process itself. It also includes other CDs that contain the source code for all the packaged software, and a CD that contains Red Hat–supplied documentation. Much of the software on these disks can be freely copied and distributed, but only the customer who bought the CD is entitled to official technical support from Red Hat. The box set also includes an array of bonus software packaged by Red Hat, as well as some proprietary software that may not be freely distributed.

❑ **The downloadable CD images.** In the true spirit of Open Source (http://www.opensource.org), Red Hat also makes all the installation CDs downloadable for free public use. While the contents of the downloadable CD images are identical to those in the official box set, users of these CD images are not entitled to official technical support from Red Hat.

These CD images can be obtained from any of Red Hat's various mirror web sites. You can find a list of mirror FTP and HTTP sites at http://www.redhat.com/download/mirror.html. Alternatively, you can obtain the CD images from VA Linux's extensive Sourceforge download mirror servers, at http://download.sourceforge.net/pub/mirrors/redhat.

When you have the CD images, you can write them onto CD recordable disks (be sure to tell your CD-burning software that you're burning *CD images*), and then you can use the CDs for installation.

The Personal Desktop configuration of Red Hat Linux that is downloaded or in the boxed set requires all three binary installation CD disks during the installation. Moreover, as you begin to explore some of the many applications supplied with the Red Hat Linux 9 distribution, you'll need these disks for installing the applications themselves. Therefore, it's worth keeping all the three binary CD disks in your possession.

The Hardware

Before you start the installation, it's a good idea to make a note of the hardware details of the machine you plan to use for your Linux installation. These details can help you to get the most out of the installation process, and even in detecting problems in the hardware configuration itself – problems that can prevent Red Hat Linux from installing correctly.

Determining Your Hardware

During the process of installation, Red Hat Linux may need some extra help to determine the exact hardware composition of your computer. To help it out, it is a good idea to make a note of the details on the following checklist, before you begin the installation:

❑ **Keyboard type:** The Red Hat Linux installation defaults to a standard US English 105-key keyboard. Unless you are using a language-specific keyboard like those used in many European and East Asian countries, you don't have to worry about this detail.

❑ **Mouse type:** Red Hat Linux supports two-button and three-button mice, as well as wheel-mice and the cordless variety. It's worth noting the exact make and nature of your mouse. Red Hat Linux also supports tablets; to verify that your make of tablet is compatible with Red Hat Linux, check the Hardware Compatibility List.

❑ **Hard disk size:** Make a note of the size of the hard disk that you'll be installing Red Hat Linux onto. If the installation process fails to detect the hard disk size correctly, it might point to an underlying hardware problem. Also note that a Personal Desktop installation will require around 1.8GB of hard disk space to cater for the programs loaded during installation. If you plan to install other applications, then you will need more.

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❑ **Video (graphics) card:** Note the chipset of the video card and the amount of RAM. While the Red Hat X-server configuration program can usually probe and detect the video card, it sometimes fails. If it does fail, you'll need to tell Red Hat Linux the name of your video card chipset. Note that the video RAM is sometimes also displayed on the computer screen during boot up of the machine.

If you can't find the name of your video card chipset in the Hardware Compatability List (see below), don't worry. Note that this means only that the GUI of Red Hat Linux is affected. Generally, if you intend to use the computer only as a server system, you're recommended not to install any GUI – this is for reasons of resource load and security. If you do want a GUI, you'll still be able to configure your machine to use the VESA interface for running the X-server. The VESA interface standard is supported by most of the commonly available video cards.

❑ **Monitor:** If you have an unusual monitor model, then the configuration of the GUI X Server software (during the installation process) might not detect it. Therefore, it's worth noting information regarding your monitor. You'll need the horizontal and vertical sync rates, which can generally be found either in the monitor manual or at the monitor manufacturer's web site.

❑ **Sound card:** While the installation tries to detect the sound card, it sometimes doesn't succeed. Therefore, it's good to note the name of the sound card chipset in advance.

❑ **Network card:** During installation, Red Hat Linux tries to detect the network interface card (NIC) and load the appropriate software driver automatically. You should note the name of the chipset of the NIC in advance of installation, just in case the installation process fails to determine it.

How do you get hold of this information? Well, if you have the technical specification documents that were supplied with your computer, then you'll find the information in there. If not, then the machine's existing operating system will probably offer some way of browsing the hardware being used. For example:

❑ In Windows 2000, you can find out about existing hardware via Start | Settings | Control Panel | System (select the Hardware tab, and click the Device Manager button).

❑ In other Linux systems, you can find out about existing hardware through via various menu options of the GUI. For example, try the options in Programs | Settings or Main Menu | System Tools, depending on which version of Linux you're using.

The Hardware Compatibility List

Red Hat maintains a list of **officially supported hardware**, called the Hardware Compatibility List (HCL). The HCL lists all the hardware components against which the operating system has been checked extensively for proper functioning. The list is available at http://hardware .redhat.com/hcl/.

It's worth checking for your own hardware components in this list before buying new hardware for your Red Hat desktop; if you find them, it can give you some peace of mind. You shouldn't panic, however, if your hardware *doesn't* appear in the HCL; there's still a good chance that it will work with the Red Hat Linux 9 installation. Many hardware components behave using standardized interfaces that can be persuaded to work with Linux (although sometimes in a less efficient way). For example, most modern video cards support the VESA mode of graphic display, which can be used by Red Hat Linux to present a GUI front-end to the user. While the VESA mode is not suitable for performance-intensive graphic displays, it is a quick and easy way to persuade an incompatible video card to work with the GUI software in the Linux operating system.

It is well worth using the HCL to check out the compatibility of hardware with Red Hat Linux (or, indeed, any distribution of Linux) before investing your money into it. A significant proportion of all queries submitted by new users of Red Hat Linux relate to hardware for which Red Hat has not confirmed official support.

While any new motherboard or processor should safely work with a Linux basic console mode, the most common problems lie with compatibility of sound and display hardware. Due to the nature of the Open Source movement, the compatibility of Linux with specific hardware configurations can take some time to develop. Not all hardware manufacturers are quick to offer Linux versions of their driver software.

The Boot Disk

The installation process will also offer you the opportunity to create a **boot disk**. The boot disk can help you to recover gracefully if you have boot problems. While creation of the boot disk is optional, it is recommended – you never know when you might need it.

For this, it's a good idea to have a floppy disk ready during the installation process. Make sure there's nothing important on the disk, because the boot disk creation process will overwrite it!

Network Details

We've already talked about compiling a hardware checklist before installation. If you intend to use your new Red Hat Linux desktop within an existing network, you should also compile a checklist of network-related information for use during the installation process. You may need to ask your network administrator some of these details:

❑ **DHCP or Fixed IP:** An IP address is essential for any computer to participate in any networking activity. So, you must ask: Is your desktop assigned an IP address dynamically (by a DHCP server), or should it be configured with a static IP address? By default, Red Hat Linux will configure your machine to request an IP address from a DHCP server, but if you need to, you can change this either during the installation process itself or after the installation is complete. If your computer is to be configured to get its IP address dynamically from a DHCP server, you can skip the rest of these questions:

❑   **IP Address:** If your machine is to have a fixed IP address, you need to know what IP address to use. An IP address is always mentioned along with its **network mask**, so make a note of both the IP address and network mask.

❑   **DNS Host and Domain Names:** You also need to note some DNS (domain name service) details – specifically the machine's host name and domain name. For example, if your network administrator assigns your machine the DNS name arwen.acme.com, then your machine host name is arwen and your domain name is acme.com. The combination of host name and domain name (here arwen.acme.com) is called the **fully qualified domain name** (**FQDN**).

If your office is running an internal DNS server, this host and domain name combination should refer to the IP address that we've already mentioned. Many network applications perform optimally when a local DNS server is present in the network.

❑   **DNS Servers:** DNS servers are responsible for resolving Internet names to the corresponding IP addresses. You should note the IP address(es) of your network's DNS server(s). If there is no local DNS server, then it's possible that an external DNS server is used for Internet name resolution. Red Hat Linux allows you to specify up to three DNS servers.

❑   **Internet Gateway:** Finally, you should note the IP address of your machine's Internet gateway. While any network traffic for your local LAN will be sent directly to those local machines, any traffic to other networks (like those of the Internet) will be sent out through this gateway. Failure to set this value will prevent you from accessing the Internet after installation.

Getting Help

If you find problems, there are plenty of ways to get answers. In fact, the Open Source community boasts of a huge number of avenues that can help you to resolve your technical difficulties.

For example, Red Hat itself has an extensive bug reporting and resolution database, freely available for public access at http://bugzilla.redhat.com. In addition, there are many Linux users' communities world-wide, hungry to share experiences and thriving on a diet of mutual support (see http://www.linux.org/groups). In fact, the extent of third-party support in Red Hat Linux is unparalleled among the various Linux distributions.

The Installation

Having collected all the information in our hardware and network checklists, you're ready to begin the installation itself. This section will walk you through the graphical installation tool, explaining the steps as we go. Although this section is quite long, it includes quite a number of screenshots, so you'll soon see how simple it is to install Red Hat Linux 9 using the graphical installation tool.

Booting off the CD

We normally begin the installation process by booting off the first CD of the distribution. To do this, you need to have the machine switched on, so that you can open your CD-ROM drive. Insert Disk 1 of your Red Hat Linux distribution into your CD-ROM drive, and then restart the machine. The installation process should start automatically, as soon as the computer's power-on self test is complete:
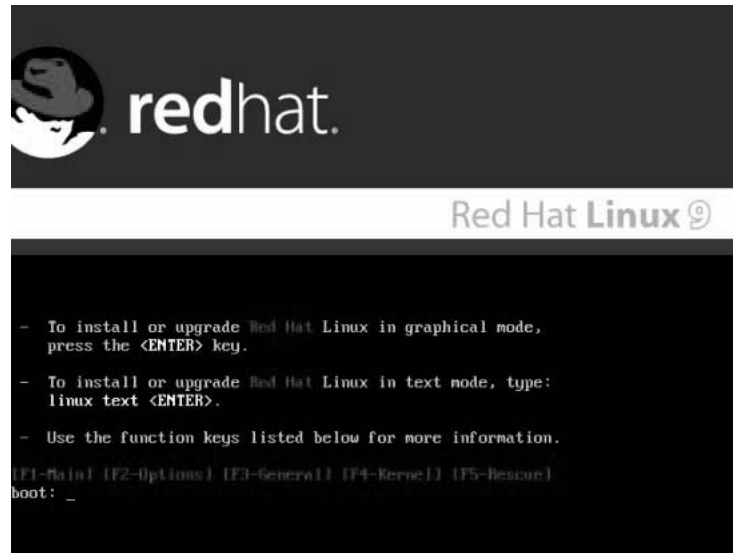
If you don't get this screen, then it may be because your computer is not configured to boot off the CD-ROM drive by default. In this case, you may need to adjust the configuration of your machine by changing the boot sequence of your computer, so that it begins with the CD-ROM drive.

The best way to do this is to reboot your computer, and take it into the BIOS setup menu immediately after boot up. The exact way to access the BIOS setup menu varies from machine to machine, but it usually involves hitting a button such as F2 or F10 or Escape. Check your motherboard's manual if you have it, or follow the instructions on screen immediately after the reboot.

The dialog asks you to select whether to install in graphical or text mode. Text mode is suitable in situations where a minimal configuration is required, or where there is a problem with the display. We will conduct our installation in graphical mode, so just press the *Enter* key.

When you've selected the mode of installation, the boot program proceeds by displaying a flurry of messages on the screen. Don't be alarmed by this – this is perfectly normal in a Linux operating system boot up. When Linux boots up, it stays in text mode briefly to perform a few routine checks and processes, and then launches the installation in graphical mode after that. So, let's deal with these initial questions of the installation.

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Testing the Media

In version 9, Red Hat has introduced a **media test module** into the installation process. The purpose of the media test module is to eliminate one of the most frequent sources of installation problems – defects in the CDs themselves. As shown below, the module asks you whether you would like to test the CD media before proceeding with the installation:
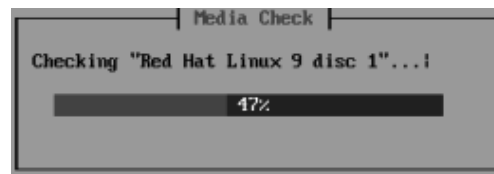
```
┌──────────────┤ CD Found ├──────────────┐
│                                         │
│  To begin testing the CD media before   │
│  installation press OK.                 │
│                                         │
│  Choose Skip to skip the media test     │
│  and start the installation.            │
│                                         │
│     ┌────┐              ┌──────┐         │
│     │ OK │              │ Skip │         │
│     └────┘              └──────┘         │
│                                         │
└─────────────────────────────────────────┘
```

This module will check your installation CDs and tell you if it finds any problems reading their contents. If you're installing from CDs included as part of Red Hat's retailed box set, then your CDs are likely to be fine. But if you've downloaded CD images and burned your own disks, then it's definitely a good idea to use this module, to check the validity of your disks.

If you want to *skip* this test (for example, if you're in a hurry or you already know that the disks are OK), use your cursor keys and *Enter* key to select Skip; and you yourself can skip to the next section.

Alternatively, to *run* the media check module (which we recommend if the disks have never been used before), press OK. This will take you to the CD media check screen:

```
┌──────────────┤ Media Check ├──────────────┐
│                                            │
│  Choose "Test" to test the CD currently    │
│  in the drive, or "Eject CD" to eject      │
│  the CD and insert another for testing.    │
│                                            │
│     ┌──────┐            ┌──────────┐        │
│     │ Test │            │ Eject CD │        │
│     └──────┘            └──────────┘        │
│                                            │
└────────────────────────────────────────────┘
```
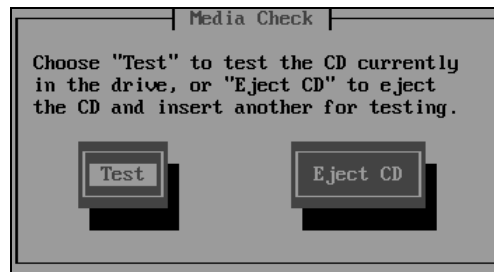
Since the first disk is already in the drive, you can simply press Test to start the media test of the disk right away. The progress of the test is shown like this:

```
┌──────────────┤ Media Check ├──────────────┐
│                                            │
│ Checking "Red Hat Linux 9 disc 1"...       │
│                                            │
│ ┌────────────────────────────────────────┐ │
│ │                47%                     │ │
│ └────────────────────────────────────────┘ │
│                                            │
└────────────────────────────────────────────┘
```

If the test completes and doesn't find any errors, you'll see confirmation that the disk passed the test:

```
┤ Media Check Result ├

The media check of the image:

Red Hat Linux 9 disc 1

is complete, and the result is: PASS.

It is OK to install from this media.



                    ┌──────┐
                    │  OK  │
                    └──────┘
```
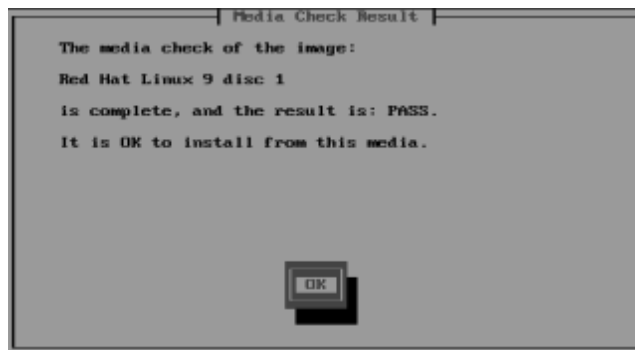
If you see an error message instead, it indicates that your CD is defective. This means that you'll need to arrange to replace it and restart the installation.

When Disk 1 has been tested, you will be prompted as shown below, which asks you whether you want to insert any other disks for checking:

```
┤ Media Check ├

If you would like to test additional media, insert the
next CD and press "Test". You do not have to test all
CDs, although it is recommended you do so at least once.

To begin the installation process insert CD #1 into the
drive and press "Continue".

       ┌──────┐              ┌──────────┐
       │ Test │              │ Continue │
       └──────┘              └──────────┘
```

You should check all the remaining CDs, by pressing the Test button each time. When all of the CDs have passed, you can press the Continue button to continue with the remainder of the installation.

The Graphical Installation Launch

Having tested all the CDs (or skipped the test altogether), the Red Hat Linux installer program – called **Anaconda** – begins, launching the graphical installer. It tries to detect the video card, monitor, and mouse, as shown below:

```
Running anaconda, the Red Hat Linux system installer - please wait...
Probing for video card:   Unsupported VGA compatible
Probing for monitor type:   Unknown monitor
Probing for mouse type:   Generic - Wheel Mouse (PS/2)
```

Note that Anaconda has failed to detect the exact make and model of video card and monitor here, and so has opted for a configuration that it thinks should work. Its choice will probably not give the best performance, but it should at least see you through the installation process to the point at which you can use your checklist to adjust the hardware configuration details more precisely.

Then it launches into the GUI install screen, as shown here. Press Next (in the bottom right corner) to continue to the next screen.

Selecting the Default Language

Red Hat supports many languages other than English during the installation process. Those more comfortable with their native language can use this screen to select the language appropriate for their use:
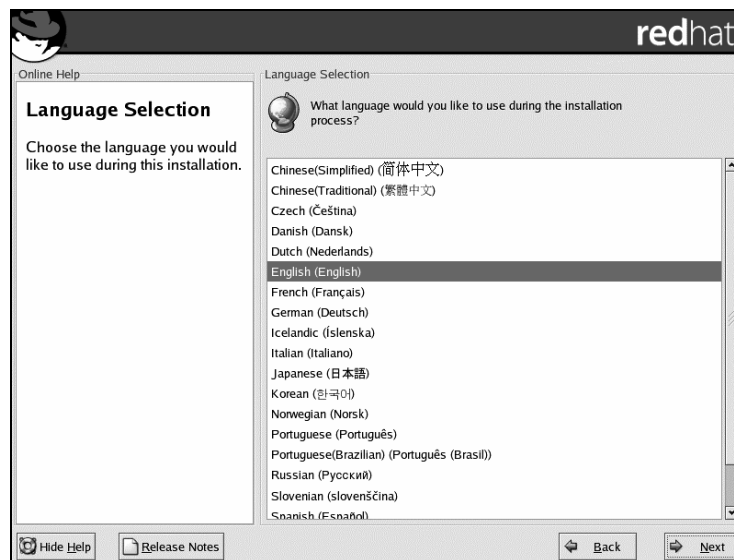
Note that many languages, notably those using various Asian Indic scripts, are missing from this list. This is because the version of the GUI toolkit used for developing the installation, GTK+, doesn't support the display of these languages. Red Hat is continually adding local language support for the installation process and the desktop itself for various localities. If your language of choice is not listed here, you will probably see it added to this list in future versions of the distribution.

Selecting the Keyboard

For many non–English speaking countries, language-specific keyboards are available for the computer. These keyboards make it easier to type in the native language. In the next screen, Red Hat Linux allows you to specify the keyboard layout of your choice:
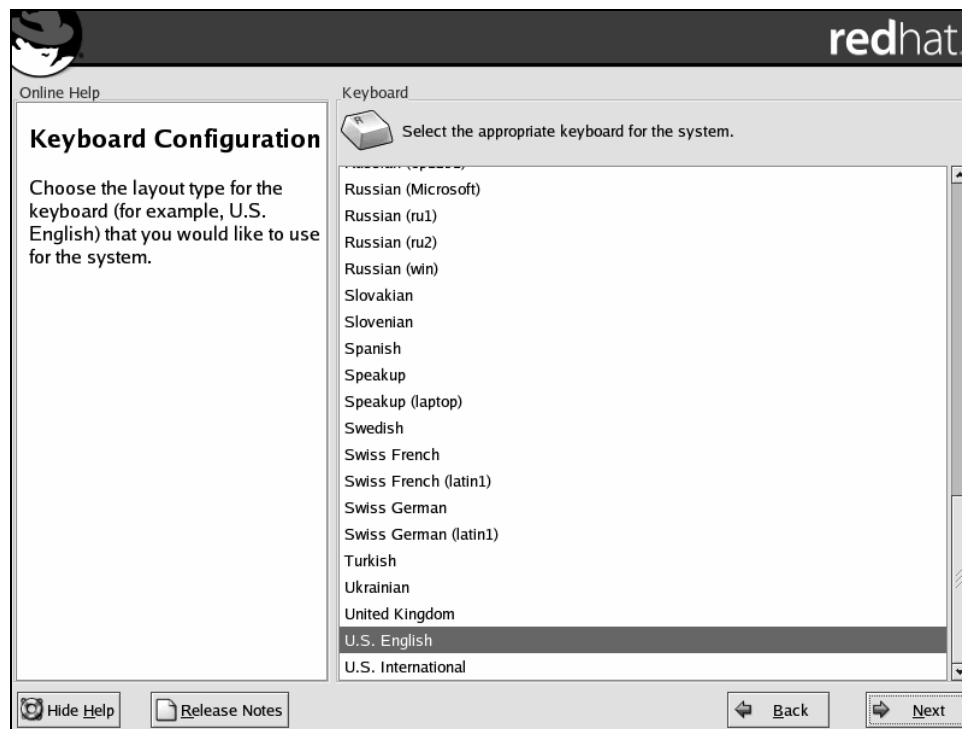
Choose your preferred keyboard option (the screenshot shows a user selecting the default keyboard layout, US English), and click Next to proceed to the next screen.

Selecting the Mouse

In the next screen, Red Hat shows the list of mouse types that it supports:
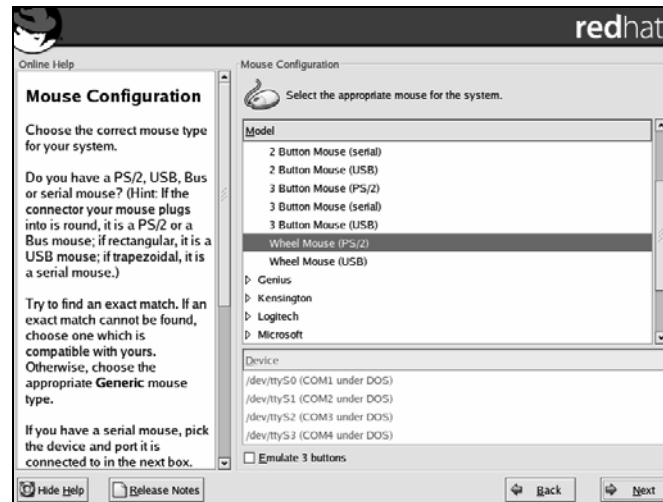
It tries to detect and select the correct mouse type automatically for you. If everything goes well, you can just click Next to go on to the next screen.

Selecting an Installation Type

At this stage, the installation will look for an existing version of Red Hat Linux on your machine. If it finds one, it will invite you to choose between **upgrading** the existing version and **replacing** it. An upgrade will take less time, and allow you to preserve any existing data on your drives while bringing the software packages up to date with the latest distribution. By contrast, a replacement may overwrite your existing data but will provide a completely up-to-date installation. Here, we'll opt for a completely new installation:
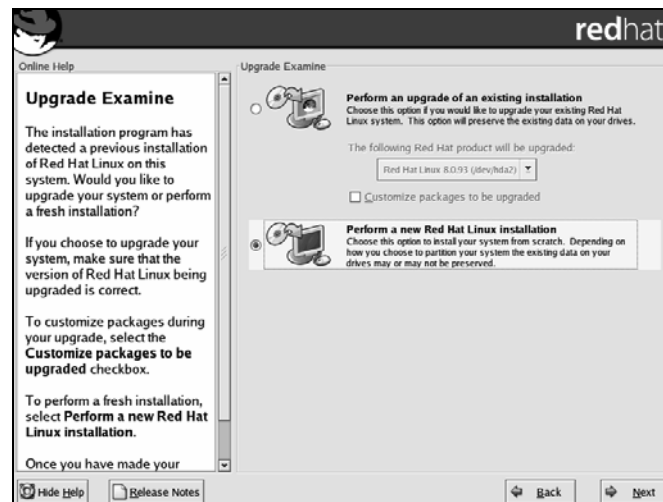
Then we come to the screen that asks us to specify the installation type desired:
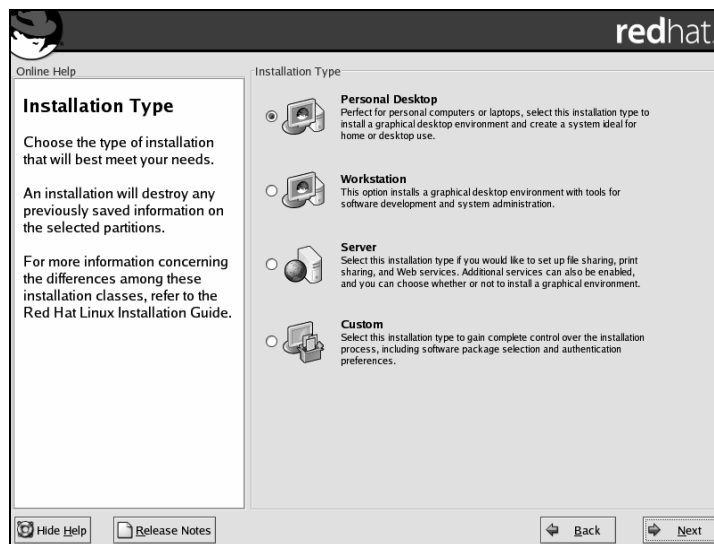
As we mentioned at the beginning of this chapter, we will use a Personal Desktop installation for our machine. We therefore select the Personal Desktop option, and click Next to proceed to the next screen.

Setting up the Disk Partitions

The next screen allows you to organize the storage space on your machine's hard disk:
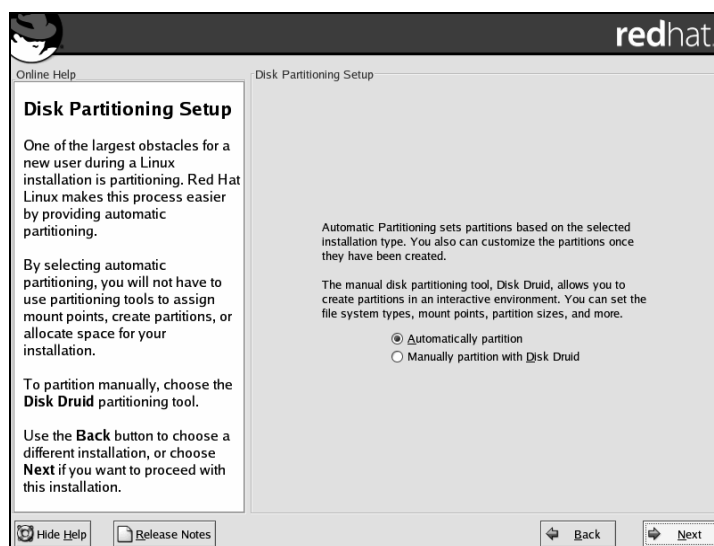
The space on your hard disk is normally divided into sections, called **partitions**, for better management of the space. Dividing a hard disk into partitions can help you segregate the available disk space according to its usage.

For example, you might choose to dedicate one partition solely to your executable programs, and to set aside another partition just to hold your work-related data files. This type of organization has the advantage that when you are upgrading your system, you can ask Red Hat Linux to leave the *data* partition of your disk alone, and upgrade only the software packages installed in the *other* partitions.

The optimum number and size of partitions on your disk depends on many factors – the overall disk size, the purpose of each partition, and so on. Such decisions are usually made on anticipated future requirements and data organization structure, and often rely heavily on previous experience. However, Red Hat Linux makes this decision simpler by offering an automatic partitioning option, which creates an arrangement of partitions based on your install type preferences. So, if you chose the Personal Desktop installation type in the previous screen, your hard disk can be automatically reorganized into partitions that are likely to be used for day-to-day personal work.

Red Hat Linux also offers an option for creating partitions manually, and if you feel comfortable and confident with creating your own partitions, then feel free to do so. However, it is normally safe enough to accept the default automatic partition option, and that's what we'll do here.

Dealing with Existing Partitions

If you already have partitions on your disk, then you can use the next screen to remove the older partitions:
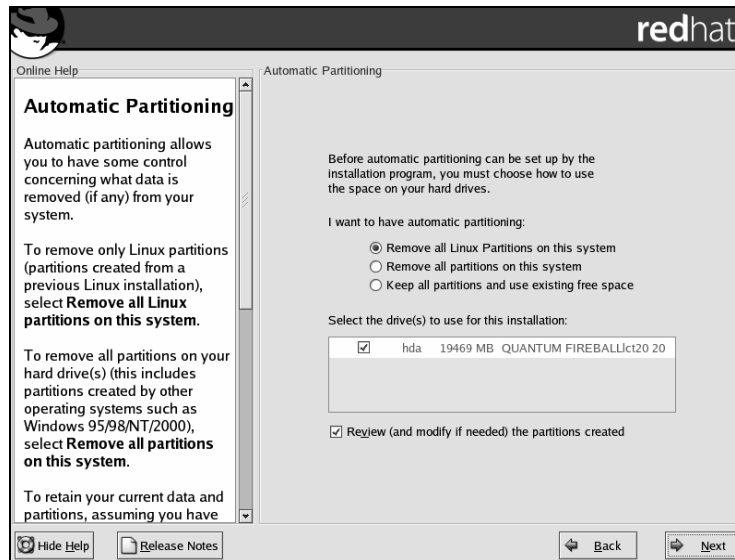
Unless you have data left on the disk, it is normally safe to accept the removal of existing partitions on the disk, by clicking on the Next button.

If your machine has an existing Windows partition that you want to keep, then you should note that it's not sufficient to choose the Remove all Linux Partitions *option here. Rather, you will need to go* Back *to the* Disk Partitioning *screen, and configure your partitions manually using the Disk Druid tool. You may even need to resize your Windows partition using a partitioning utility like PartitionMagic, to create some free space onto which you can install Red Hat Linux*

If you have existing partitions, and you have asked Red Hat Linux to remove them for you, you will be asked to confirm your desire to remove the partitions:
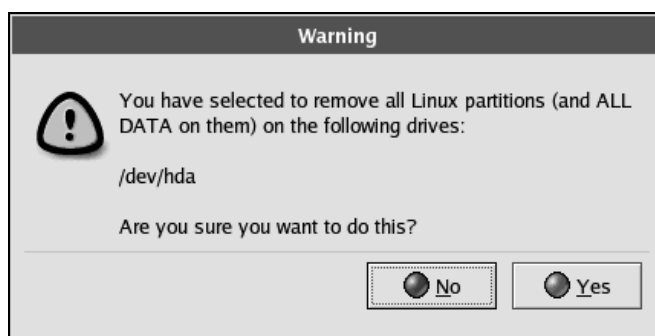
Before accepting the removal of the partitions, be aware that removal of partitions leads to complete loss of any existing data on the disk. If you are sure about your decision, confirm the deletion (by clicking Yes) and move on to the next screen.

Setting the Boot Loader

In the next screen, Red Hat Linux allows you to set various boot loader options. A **boot loader** is normally required when you have multiple operating systems on the hard disk, and an option (at boot time) for choosing the operating system to boot from. Red Hat provides the **GRUB** boot loader for this purpose.

The screen provides you with an option to specify the *default* operating system to boot from:
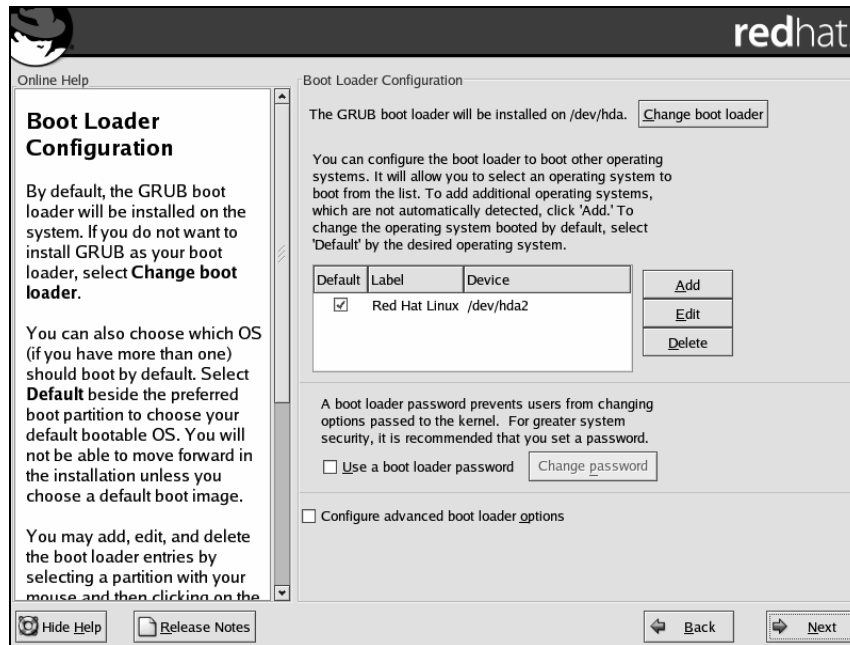
In this example we are dealing with a new installation, and for this reason the screenshot above displays just a single option in this list.

You can also set a **boot loader password** in this screen. A boot loader password prevents others from modifying the boot time parameters of the Linux kernel. Any user can, for example, boot the computer into a maintenance mode and then change the root password, thereby taking control of the whole computer. If your computer is unlikely to be handled by others, or if you implicitly trust others who will be using this computer, you can safely ignore this option. If you set a boot loader password, you should keep the password safely in your personal records.

So, in most situations, you will not need to change anything in this screen. You can just click Next to move on.

Setting the Network Parameters

The installation process now takes you into the network configuration section. Your network configuration checklist will come in handy in this section:
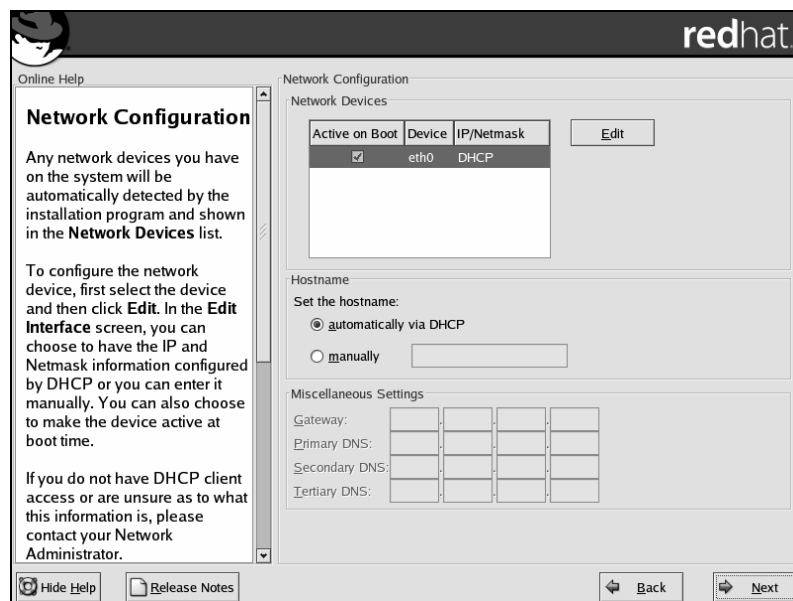
Note that if Red Hat Linux does not detect your network card automatically, your Network Devices *table (at the top of the screen) might be empty. This will prevent you from setting the network parameters for your computer. If that happens, don't panic; all the network parameters on the screen can be configured after the installation process is complete, via the* Network Configuration *dialog (*Main Menu | System Settings | Network*).*
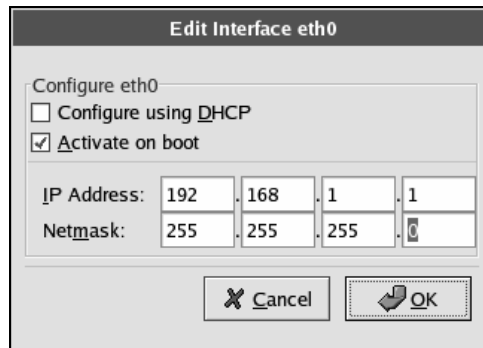
By default, Red Hat Linux selects automatic network configuration of your computer using the **DHCP protocol**. Therefore, if you have a single desktop at a home or office environment, or if your machine exists in a LAN environment whose IP addresses are provided by a DHCP server, then you can skip this screen and proceed to the Firewall screen that comes next.

However, if your machine exists in a LAN environment that requires static IP addresses, then you have an opportunity now to set your network configuration.

Again, you don't have to do this now; if you prefer, you can skip the network configuration at this stage and configure your network settings after the installation is complete, via the Network Configuration *dialog.*

Manually Configuring the Network Devices

If you choose to do it now, you can use your network configuration checklist to fill up the entries on the screen. First, click on the Edit button at the top section of the screen to bring up the network device configuration dialog box:

Here, deselect the Configure using DHCP option, and enter the IP Address and Netmask details as per your network configuration checklist. For example, in the screenshot we have set the IP address and the network mask to 192.168.1.1 and 255.255.255.0 respectively.

When you've set the network parameters, click OK; the Network Devices section will now reflect your new settings.

Configuring DNS Hostname and Servers

While you're on this screen, you can also set the DNS hostname and the DNS servers (which you should have noted in your network configuration checklist). You can specify these values in the appropriate entry boxes near the bottom of the screen. At the end of your configuration, your screen should look something like this:

Setting up the Firewall

The next screen of the installation relates to the setup of a **network firewall** for your machine. A network firewall protects your computer from attacks or intrusions from malicious crackers in the network, and we'll learn more about configuring firewalls in Chapter 12. For now, Red Hat Linux provides you with three levels of network firewall security:

❑ **Highly secure firewall:** This level of security is suitable for those who are quite concerned about their security. Here, all incoming network connections are disallowed unless specifically listed in the services list on the screen. To facilitate normal working, only two exceptions are made – incoming DHCP connections are allowed so that the machine can configure itself, and incoming DNS replies are allowed so that Internet applications can work normally.

❑ **Medium grade secure firewall:** This is the default level of security, and is generally adequate while using the Internet. This level disallows incoming network connections to privileged ports like web, SMTP mail, etc. However, you can customize this level to allow certain incoming connections to services that your desktop is providing. For example, if you set up a web server on your machine and want others to access it, you can check the WWW option in the services list on the screen.

❑ **No firewall:** If you are unlikely to connect to the Internet, or if you are not concerned with cracking activities that can be directed by troublesome individuals on the Internet or your LAN, then you can select this option. This option doesn't set up any firewall on your machine. In other words, it allows any outside individuals to access network resources on your computer.

Selecting the No firewall option doesn't necessarily mean that all users on the network have direct and unchecked access to your computer's network resources. A firewall is just the first line of defense against intruders. Most network applications have some form of access control that decides who finally gets to use these resources.
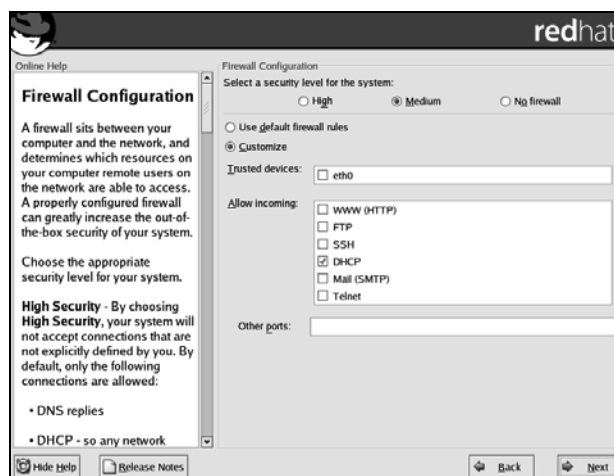
You can also customize the firewall rules within these different levels of security. Red Hat Linux allows you to select the trusted devices – network interfaces that are expected to carry traffic from sources that you can trust blindly. In a home network this would generally be the interface card connected to the rest of your home network. You should definitely not mark your Internet interfaces as trusted, unless you are absolutely sure about your security needs.

Apart from these devices, this screen also allows you to specify network services that external network identities will be able to access from your computer. To be on the safe side, select only the services that you actually expect to be used, and that do not have insecure software behind them. For example:

❑ SSH (Secure Shell) allows you to work on a remote machine while ensuring that the data exchanged in the process is kept encrypted and secure. It is generally safe for SSH servers to be open; indeed, this is recommended if you want to be able to access your computer from other machines.

❑ If you want to use this machine to receive mails from others, you may choose to have an SMTP server on your machine receive these mails. In this case you should allow incoming connections to the SMTP server.

❑ Many FTP servers have had a long history of insecurities. It is advisable to leave incoming connections to such FTP services closed, and open them up in the firewall only when you need them. When you've finished, you should immediately cut off their access using the firewall.

Setting Additional Language Support

If you're expecting to use multiple languages, you can select them in the next screen:
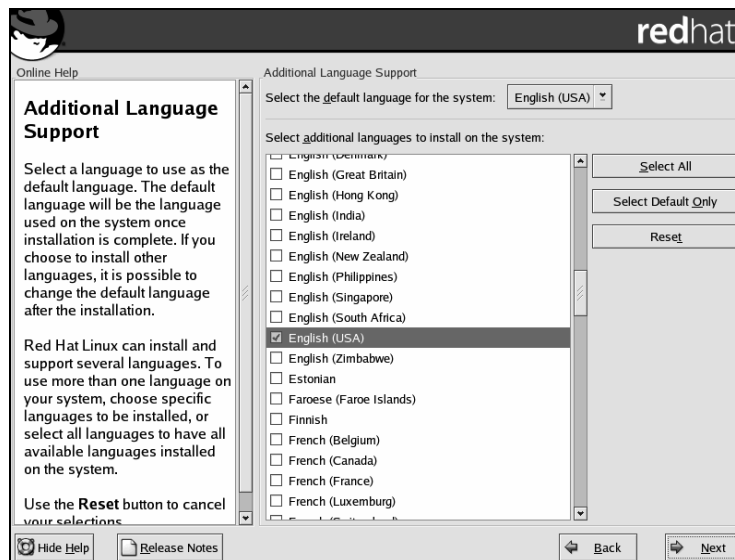
Normally, it is safe to continue to the next screen after accepting the defaults that are offered by Red Hat Linux.

Setting the Time Zone

In the next screen, you can set the time zone of your location:
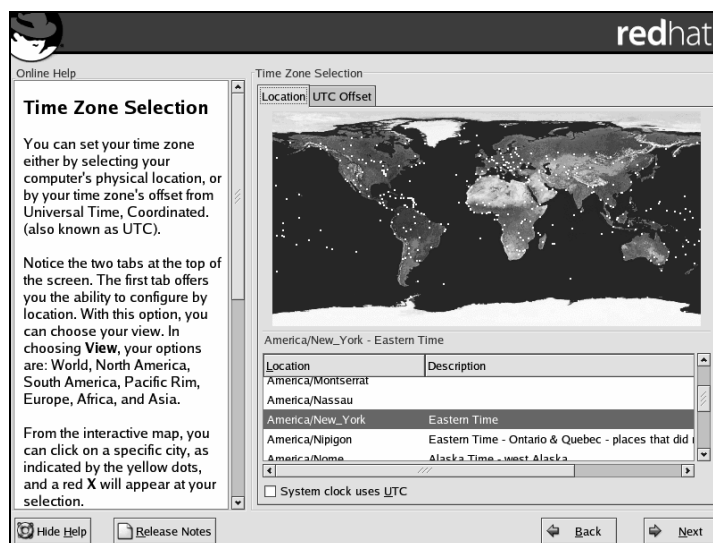
Red Hat provides a very usable graphical method for intuitively selecting your time zone. To use it, bring your cursor to any point of the displayed world map – this allows you to set the time zone of your computer to that of the selected region. A green sticky arrow in the mouse cursor makes the job easier by selecting the city time zone nearest to the cursor. In the screenshot above, we have set the time zone to that of New York.

Note the option at the bottom of the screen to enable UTC time in the computer clock. This allows the system to run with correct timezone and daylight saving changes. (Note that you shouldn't use this if you have a dual-boot machine that also boots Windows.)

Root Account Configuration

By default, the installation process creates a single administrative user account for your machine, called **root**. We'll learn more about the system's users in subsequent chapters of the book – particularly Chapter 8. For now all you need to know is that whenever you use the system, you do so through the context of a **user account**, and that to do so you log in by specifying the user account's name and a password.

Every user account on the system has its own password, and the root user (or superuser) is no different in this respect. In this screen, you are asked to supply the root user's password:
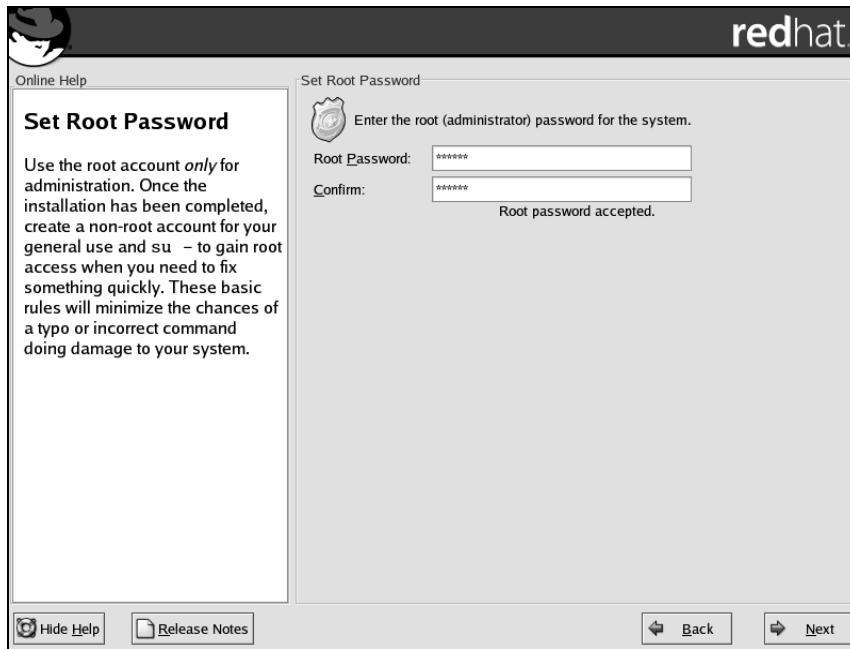
Of course, you are asked to type the password twice, to confirm that you didn't mistype the first time. Type the password carefully each time to make sure you type it correctly.

You might encounter a message that tells you that the password is too short or too simple. This is a security feature, designed to remind you of the importance of choosing an unguessable password. If you consider your chosen password to be adequate for your needs, you can ignore these messages. However, for the sake of security you should make an effort to set an uncommon password for the superuser account. We'll talk more about password security (and the techniques that people use for breaking passwords) in Chapters 8 and 12.

Selecting Packages for Installation

Now, you have an opportunity to choose the software packages that you want installed along with the system. Red Hat Linux has already chosen a combination of software packages for the installation type that you selected at the beginning of the installation process. If you want to fine-tune the package selection, you can do so here by selecting the Customize... option:
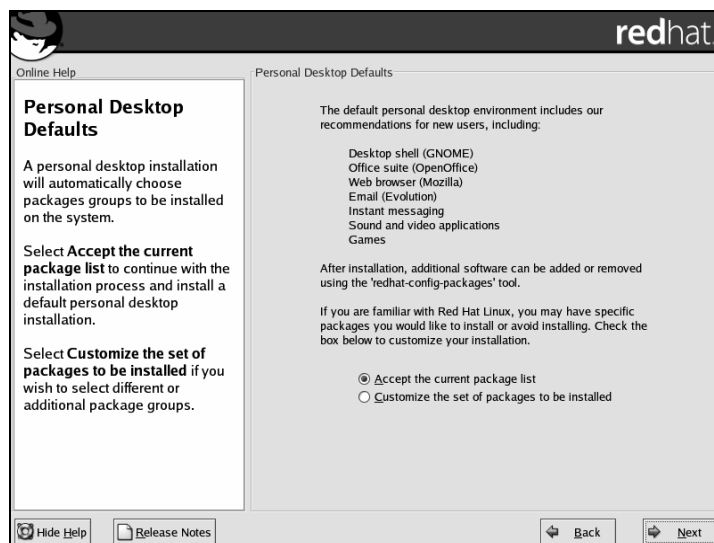
You don't have to fiddle with the choice of installed packages here – it's easy to add and remove packages after the installation is complete, as we'll see in Chapter 4. So, to keep things simple, we'll select the Accept the current packages list option here, and proceed to the next screen.

The Automatic Installation Process

The Red Hat Linux graphical installation tool has now collected all the information that it needs to begin the installation. The next screen prompts you to begin the software installation:
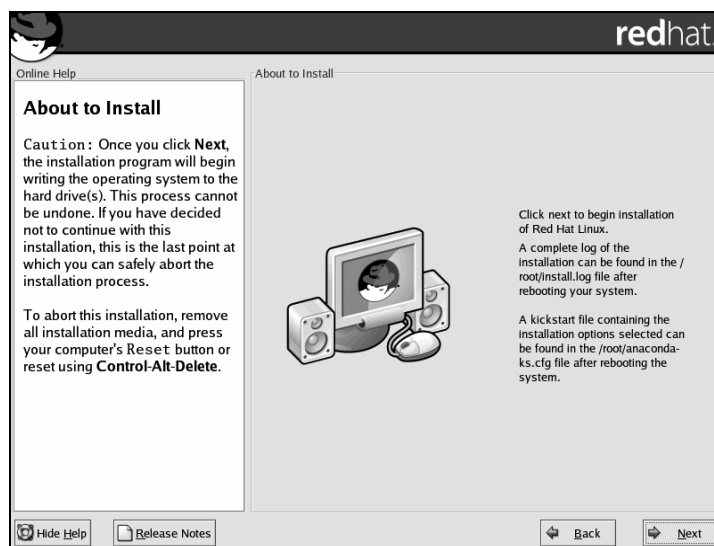
The software package installation is mostly automatic; the only thing you'll need to do at this stage is change the CD a couple of times (when prompted to do so) and admire the photographs that are displayed while the necessary packages are installed.

Before the software is installed, the installation process formats all the partitions that are supposed to hold these data. Then, the installation process continues by installing the software packages. Progress bars display the total time taken so far, and the estimated time of the software installation:

Creating a Boot Disk

With all the software packages installed, we go on to the screen shown opposite. Here, you are asked whether you would like to create a boot disk for your computer. A **boot disk** is a safety measure against problems that might occur in the boot loader. For example, installation of another operating system in the computer might overwrite the Red Hat Linux boot loader, GRUB – if that happened, it would be impossible to boot back into Linux. The boot disk helps us tackle such situations by providing an alternative way to boot into Linux.

You don't have to create a boot disk, but we recommend that you do (unless you already have a boot disk from a previous installation of this particular operating system):
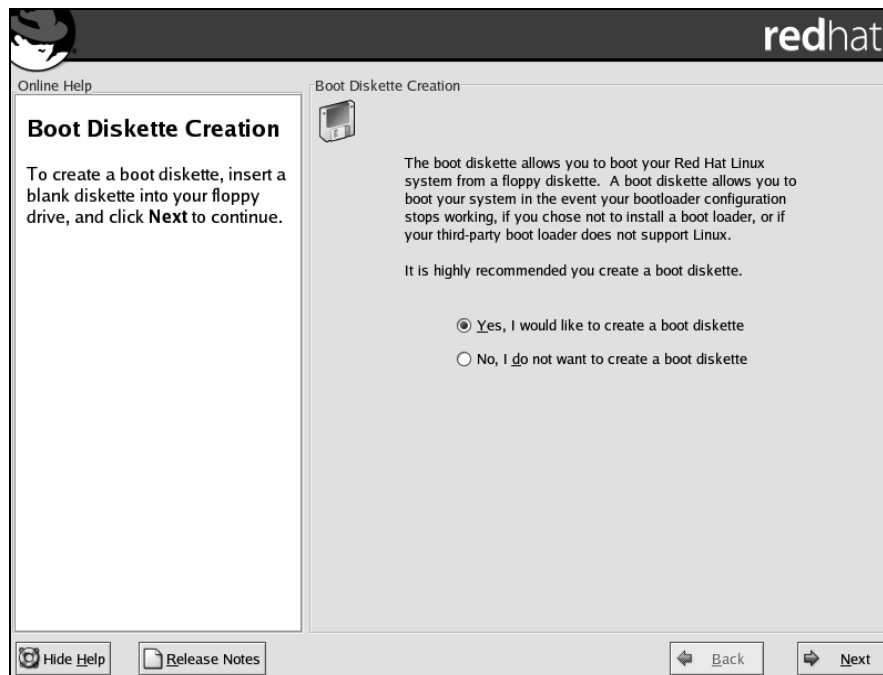
The installer asks you to insert a suitable floppy disk for the boot disk creation process. Remember that the installation process overwrites all the contents of the disk, so you should provide a blank floppy disk or one that doesn't contain any important files:

When you insert the disk and confirm the creation, the installer starts the boot disk creation process. When the boot disk has been created, you should take it out of the floppy drive, label it, and put it in a safe place.

Setting up the GUI

The final step of the installation process is to set up the graphical interface (X) for your computer:
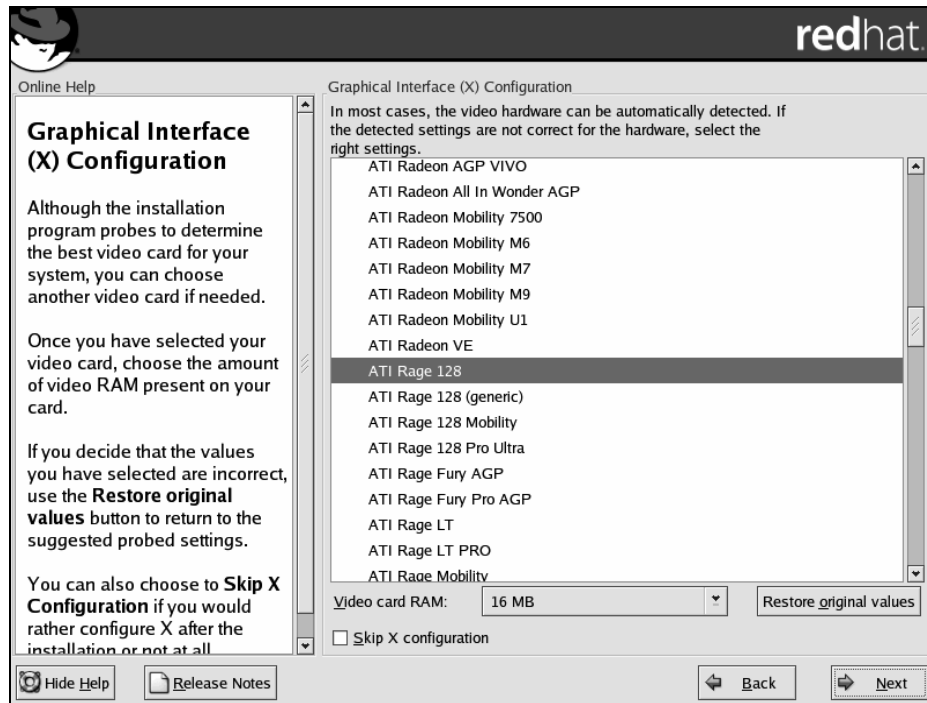
Red Hat Linux should normally be able to detect the type of your video card and select it for you, and it is quite safe to accept the default values. If you want to be *sure* that it's got the right configuration, check the setting here against the make, model, and RAM you noted in your hardware checklist, and adjust as necessary.

> *Note that if you try experimenting with graphics modes during the X server configuration, you run the risk of crashing the computer, leaving the installation process unfinished. If you have any element of doubt regarding the compatibility of your video card with Red Hat Linux, you should probably skip the X-server installation process by checking the* Skip X configuration *checkbox at the bottom of the screen. You can always configure the X server after the installation.*

> *If you can't find your video card in the list, you should skip the X server configuration. It's possible to configure your graphics card after the installation. Alternatively, you can try using the generic VESA card from the given list, which is likely to work with most of the unsupported video cards.*

Red Hat Linux then proceeds to detect the type of monitor being used. The monitor detected during installation will be highlighted on the screen as shown:
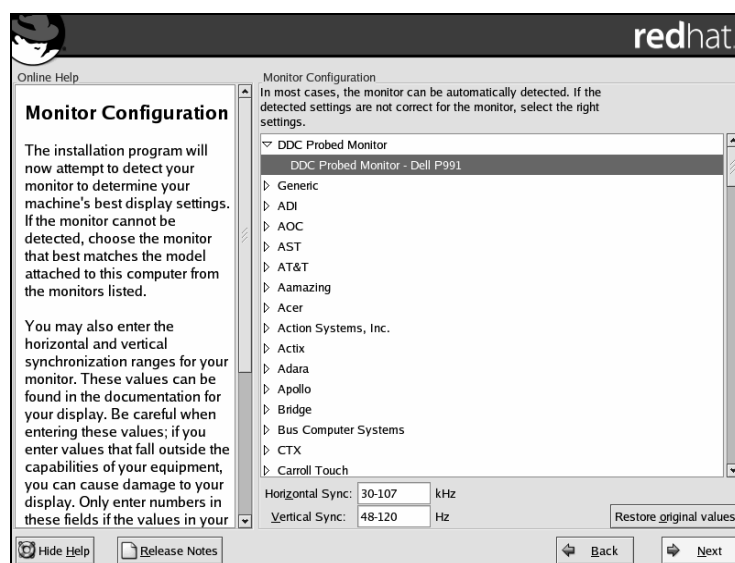
If you don't find your monitor in the list, you can enter the horizontal and vertical sync information in the textbox entries at the bottom of the screen instead.

The video card and the monitor type allow Red Hat to formulate a list of video modes that can be supported on your computer. The video mode is determined by the screen resolution and the color depth (number of colors) in which objects can be shown on screen. The available color depth and resolution choices are displayed by Red Hat Linux in the next screen:
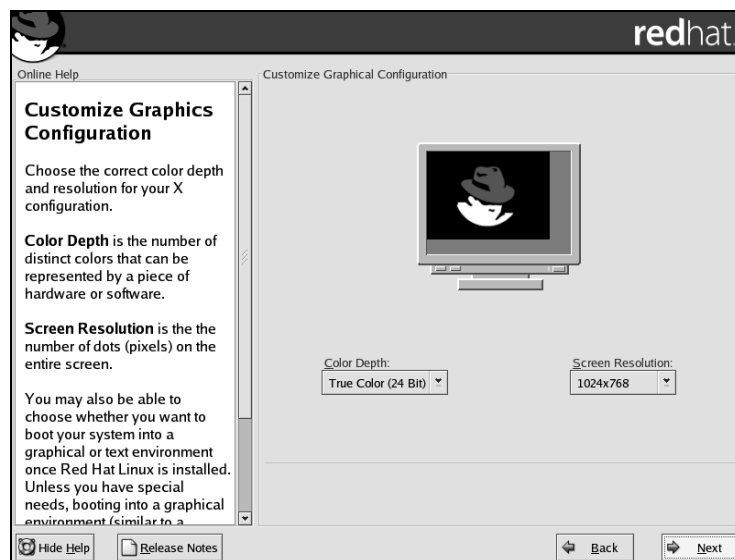
While you can test the chosen setting using the Test Setting button, be aware that for graphic cards with partial support by the X-server, improper modes can crash the system and leave the installation process unfinished. If you're not sure about the compatibility of the chosen video card with the X server, you can skip the X configuration and configure it after the installation is finished.

Red Hat Linux also offers you a choice between booting into a text-based interface and a graphical interface. If you haven't had any issues with your graphics card in the installation process until now, you should accept the pre-selected setting of a graphical login.

Finishing

This completes the installation of the Red Hat Linux operating system. Now, you need to remove any CDs and floppy disks from their respective drives, and click on the Exit button to reboot the machine:
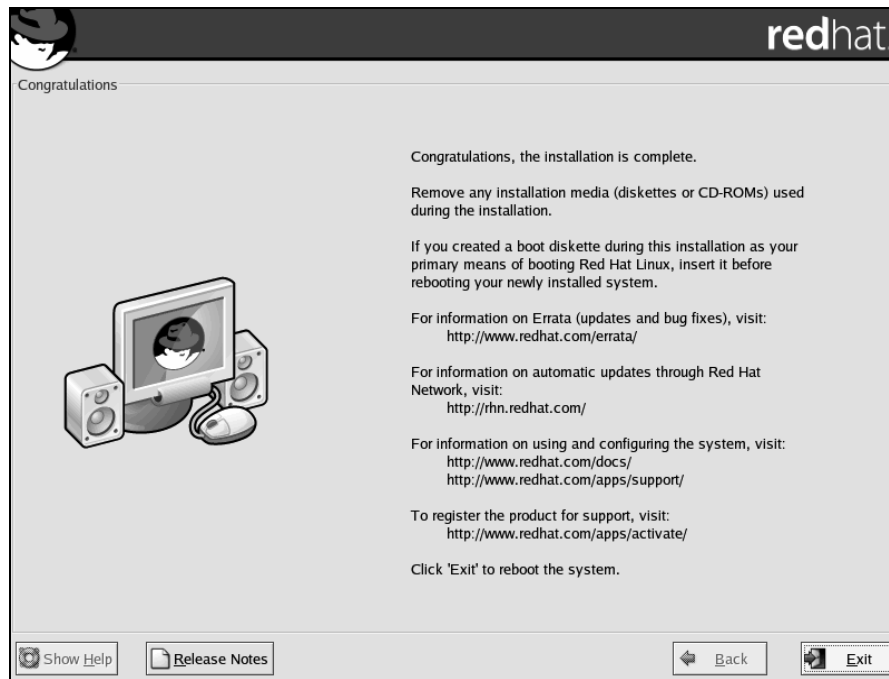
Booting Up

When the computer has restarted, the boot loader takes over initially, as shown in the following screenshot:

40

The boot loader shows the available operating systems to boot from. For this chapter we used a new installation, and so there is just a single entry in the list shown above. The selected option will be booted automatically within a few seconds, and you can hasten the process by pressing the *Enter* key. This screen should be followed by a long list of rapidly moving text messages, as Linux boots into its new installation.

First Boot

Before the new installation is fully usable, Red Hat configures the last few parameters:

❑   Setting up new user accounts

❑   Setting the date and time

❑   Configuring the system for the Red Hat Network

❑   Selecting additional distribution software or documentation to be installed

The welcome screen (which we won't show here) shows the list of parameters to be configured. Click Forward to move on to the first of these screens.

Creating New User Accounts

We've already talked a little about the root user account – this is an administrative (or "superuser") account that is created by default, and has privileges for performing just about any task that you need on the computer.

The problem with working as root all the time is that these privileges make it very easy to accidentally delete important files that you don't mean to delete. For this reason, it's recommended that you create a "normal" (non-administrative) account for your personal use, and use that most of the time.

The following screen allows you to do that – you just need to choose a username and password, and (if you like) type your full name too:

When you've done that, click Forward to continue.

Setting the Date and Time

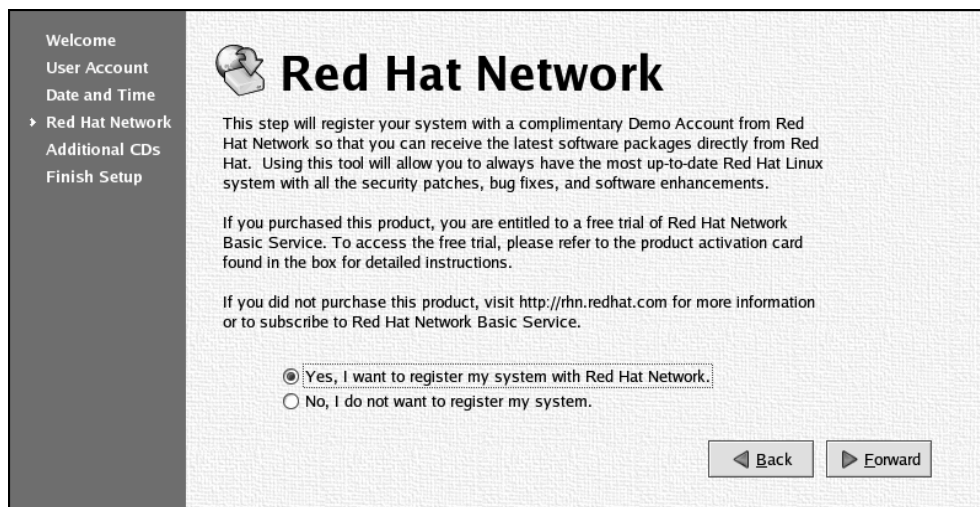Next, check (and if necessary set) the date and time for the computer:

As you can see, this page has a fairly intuitive calendar interface, and you can set the time using the entry fields toward the right of the screen.

Over a period of time, the clock in the computer tends to drift away from the actual time of the computer. To keep the clock in sync, you can use the **Network Time Protocol** (**NTP**) option in the same screen – this allows you to specify an NTP server, and the machine will keep in sync with it.

You can find a public NTP server on the Internet from www.ntp.org.

Registering for the Red Hat Network

The next step is the Red Hat Network configuration. This is a service provided by Red Hat, and is designed to help you keep the computer updated with whatever new packages, improvements, or bug fixes have happened since the Red Hat 9 distribution. For this service to start working, you need to create an account on the Red Hat Network (RHN, http://rhn.redhat.com) and register the computer:

While registering your system in the Red Hat Network is highly recommended, you might decide to defer the registration process (by selecting No…) until the installation process is complete. The Red Hat Network registration process can be invoked again from the desktop menu (Main Menu | System Tools | Red Hat Network) at any time.

Installing Additional Software

We've already had one opportunity to install additional software and documentation from the range of material available on the Red Hat Linux distribution CDs, and now we get another chance. The process now presents us with another opportunity:
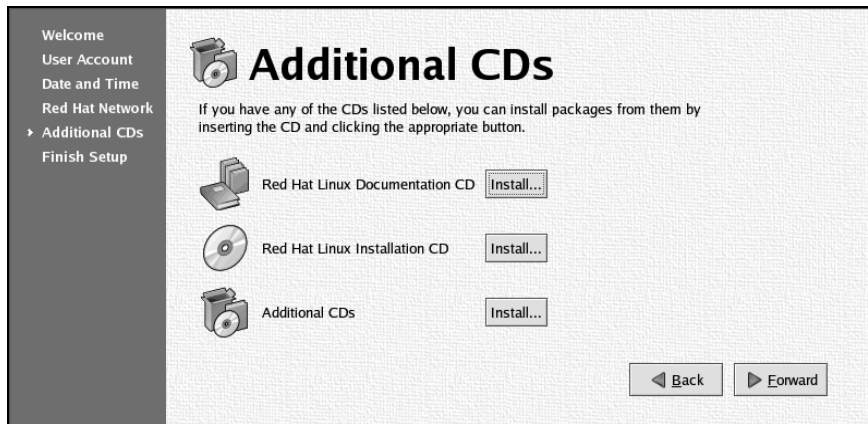
If you have a documentation CD (for example, the one that is included in the box set distribution), it's a good idea at this stage to install the documentation contained within it (that's the top Install button). The subsequent dialogs will talk you through the process, telling you when to insert the CD and so on.

If you like, you can also click the other Install buttons here to install further applications. However, you don't need to do that now; you can install and uninstall applications anytime, via the package manager, as we'll see in Chapter 4.
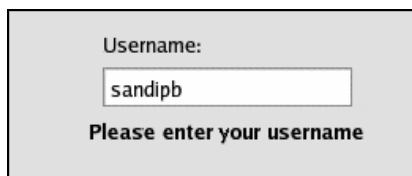
Completing the Installation Process

Finally, the installation process is over. You can now start to use your brand new desktop – just click Forward one last time:
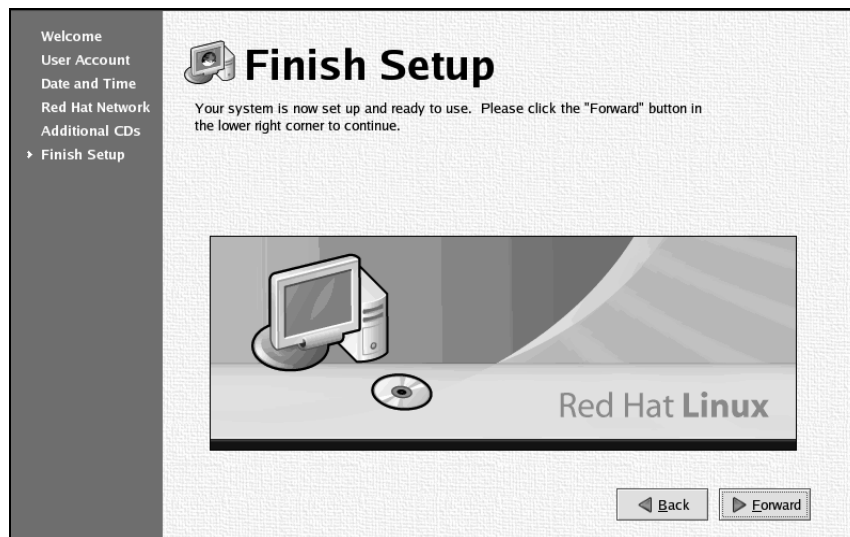
Logging In

In the login screen, you'll be prompted for a username. Type the username you created earlier on. Here, I'll use the sandipb account I created a few pages back:

Username:

sandipb

Please enter your username

Then you'll be prompted for the password for your user account – enter that too. This will start up the desktop. The default desktop in Red Hat Linux 9 is the **GNOME** desktop. You'll see a user interface like the one shown below, with icons in the top-left corner, and a panel at the bottom:

sandipb's Home

Start Here

Trash

Wed Feb 26
4:01 PM

That's it! The installation is complete, and you're ready to start using the graphical user interface to start making the most out of your Red Hat Linux 9 operating system. We'll begin to explore it in the next chapter.

Summary

In this chapter, we looked at the various steps of the installation of the Red Hat Linux 9 operating system.

We started by noting that the installation process requires various pieces of background information about the hardware and network configuration of the computer, and compiled two checklists of information. The Red Hat Linux installation is easier if you prepare these checklists before you start the installation.

After choosing the native language of the installation, the first important choice you make in the installation itself is the installation type. We chose the Personal Desktop installation type for this chapter, though there are four installation types offered by the installation process.

The installation continues with configuration of the keyboard and mouse, and searches for existing installations – offering you the opportunity to upgrade an existing installation if it finds one. The next choice relates to disk partitioning – the organization of your hard disk into logical partitions. If you feel comfortable with this, you can configure your own partitions; otherwise, you can allow the installation process to do it for you (as we did in this chapter).

After choosing the default boot loader – the software that is used to boot the operating system – we moved on to network configuration options. In single machine situations it's enough to use the default network configuration, but in situations where you plan to connect to a local area network (LAN) it helps to know whether to choose the default setup (which configures the machine to use a DHCP server), or insert specific static details of the IP address, subnet mask, and so on. Of course, you don't have to get these right the first time – if you're not sure or if you get them wrong then you can reconfigure them using the dialogs, any time after the installation is complete.

The next decision relates to the firewall options available for the desktop – again, we decided to go ahead with the default standard firewall for this installation. After setting the time zone, a password for the root user, and adding any additional software we choose to add at this stage, the process of collecting information is complete and the installation can proceed.

After the software installation, we did the sensible thing by creating a boot disk (just in case we have problems with the boot loader). Finally we set up the X-server to give us the GUI of the desktop, and reboot the machine, and this completes the initial installation of the Red Hat operating system.

On the first boot of the new installation, Red Hat asks us to create a non-administrative user account, check the date and the time on the computer, and register with the Red Hat Update agent (if we like); and it gives us yet another chance to install software and documentation. When this is complete, we can log on to the machine and begin our work!

In the next chapter, we will look at how to use the freshly installed desktop. We will begin to explain important concepts like the file hierarchy and devices, which will help you to work effectively in Linux. We'll look at various components of the desktop and how to customize them, and we'll take a look at how to check the hardware configuration of the machine and how to manage and control processes in the system.