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Installing Fedora 2

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 using only 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 U.S. keyboard.

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

Red Hat, in particular, has caught the attention of the public, breaking away from the standard tradition of distributing disc images and pioneering the concept of distributing software in the form of packages. (Right now, the Red Hat Package Manager, or RPM, is a standard in distribution of precompiled software packages in the Linux world; RPM is further covered in Chapter 4.)

Red Hat has also been improving Linux usability and features in the most daunting area of any operating system—installation. The latest version of Fedora, Core 2 is truly the most user-friendly ever, with extensive inputs from professional usability experts and a new look to attract even the most hardened technophobes.

The Fedora 2 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 such as 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 such as 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 on 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 several cases, any one of the preceding installation options may not have all the functionality required. These installation options are not set in stone; that is, if you install a particular option, it does not mean that you cannot take advantage of applications available in another option. You may very well install a particular option and then choose to install additional software that you find useful. Installing additional software is covered in detail in Chapter 4.

This chapter takes a look at getting a Personal Desktop installation in place on a new computer. It looks 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 Fedora 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, such as Internet browsing, e-mail, and office productivity tools.

Preparing for the Installation

While the installation process is quite straightforward, it is essential that you prepare ahead of time to ensure that the installation process goes smoothly. Of course, you'll need the necessary installation disks to install the system; but it's also worth looking over your hardware, too. This section examines both software and hardware aspects of preparation.

The Software

To begin with, you need to have the necessary *software* for the job. The Fedora 2 distribution can be obtained from a number of sources. Here are a couple of options:

- ❑ **The Publisher's Edition DVD included with this book:** This includes all the material that you need for the installation process itself. This chapter looks at installation using the DVD that is included in this pack.
- ❑ **The downloadable CD images:** In the true spirit of open source (www.opensource.org), Fedora is also available as CDs downloadable for free public use.

These CD images can be obtained from the official Fedora Web site at <http://fedora.redhat.com>.

After you have downloaded the CD images, you need to write them onto CD recordable discs (be sure to tell your CD-burning software that you're burning *CD images* or *ISO images*), which you may then use for installation.

If you are using CDs rather than the accompanying DVD, please note that the Personal Desktop configuration requires the first two installation CD discs during the installation. As you begin to explore some of the many applications supplied with the Fedora 2 distribution, you'll need the remaining discs for installing these applications. Therefore, it is worthwhile to hold on to all three binary CDs discs.

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 get the most out of the installation process, and even in detecting problems in the hardware configuration itself—problems that can prevent Fedora 2 from installing correctly.

Determining Your Hardware

During the process of installation, Fedora 2 may need some extra help to determine your computer's exact hardware composition. 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 Fedora 2 installation defaults to a standard American English 105-key keyboard. Unless you are using a language-specific keyboard such as those used in many European and East Asian countries, you don't have to worry about this detail.
- ❑ **Mouse type:** Fedora 2 supports two-button and three-button mice, as well as wheel mice and the cordless variety. You should note the exact make and nature of your mouse. Fedora 2 also supports tablets; to verify that your make of tablet is compatible with Fedora 2, check the Hardware Compatibility List.
- ❑ **Hard disk size:** Make a note of the size of the hard disk that you'll be installing Fedora 2 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 1.9GB of hard disk space for the programs loaded during installation. If you plan to install other applications, you will need more.
- ❑ **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 Fedora 2 the name of your video card chipset. Note that the video RAM is sometimes also displayed on the screen while the machine boots.

If you can't find the name of your video card chipset in the Hardware Compatibility List (described in the next section of this chapter), don't worry. Note that this means only that Fedora 2's GUI is affected. Generally, if you intend to use the computer only as a server system, you're recommended not to install any GUI 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, the configuration of the GUI X Server software (during the installation process) might not detect it. Therefore, it's worth noting your monitor's specific information. 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, noting the name of the sound card chipset in advance is a good idea.
- ❑ **Network card:** During installation, Fedora 2 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.

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

- ❑ In Windows 2000 or Windows XP, 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 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 Fedora 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 Fedora 2 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 Fedora 2 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 Fedora 2 (or, indeed, any distribution of Linux) before investing your money in it. A significant proportion of all queries submitted by new Fedora users 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 creating the boot disk, 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 Fedora 2 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, Fedora 2 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 you are installing your Fedora machine to connect to an ISP or if you have a DSL or cable modem connection with a cable or DSL router, your system is most likely to be assigned an IP address by a DHCP server. If you want to run a Web site or other type of server from off of your Fedora installation, you might want to think of obtaining a static IP address. In all likelihood, your ISP will impose an additional charge for a static IP address. You may want to refer to *Chapter 3* for more information on setting up Fedora in different network environments.

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 domain name service (DNS) 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`, 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 previously 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, it’s possible that an external DNS server is used for Internet name resolution. Fedora 2 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 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 user communities worldwide, hungry to share experiences and thriving on a diet of mutual support (see www.linux.org/groups). LinuxQuestions.org (www.linuxquestions.org) is an excellent online forum for questions on Linux in general, and Fedora in particular.

The Installation

Having collected all the information in your hardware and network checklists, you're ready to begin the installation itself. This section walks you through the graphical installation tool, describing each of the installation steps.

Booting off the CD or DVD

You typically begin the installation process by booting off the DVD or the first CD of the distribution. To do this, insert the accompanying DVD disc into your DVD-ROM drive or insert Disc 1 of your Fedora 2 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 do not see a Fedora boot screen, it is quite likely that your computer is not configured to boot off the DVD-ROM or CD-ROM drive by default. In this case, you may need to adjust your machine's configuration by changing the boot sequence of your computer, so that it begins with the DVD-ROM or CD-ROM drive.

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

The boot screen dialog box 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.

Testing the Media

Fedora presents you with a *media test module* prior to launching 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 DVD or the CDs. As shown in Figure 1-1, the module asks you whether you would like to test the DVD or CD media before proceeding with the installation.

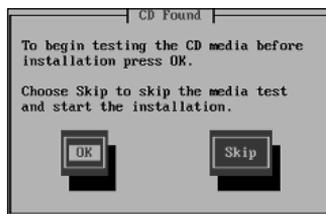


Figure 1-1

This module checks your installation DVD or CDs and informs you if it finds any problems reading their contents. If you have downloaded CD images and burned your own disks, it's definitely a good idea to check the validity of your disks at this point. You should generally have no issues with validity of the media if you are using the accompanying DVD disc.

If you want to skip this test (for example, if you're in a hurry or you already know that the disks are okay), select Skip, and go on 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 takes you to the CD Media Check screen, shown in Figure 1-2.

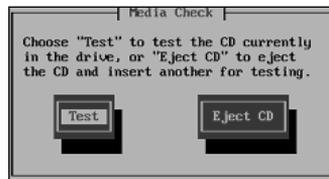


Figure 1-2

If you are using CDs, because the first disc is already in the drive, you can simply press Test to start the media test of the disc right away. If the test completes and doesn't find any errors, you'll see confirmation that the disc passed the test.

If you see an error message instead, it indicates that your CD or DVD is defective. This means that you'll need to arrange to replace it and restart the installation.

If you are using CDs, when Disc 1 has been tested, you will be prompted as to whether you want to insert any other discs for checking (see Figure 1-3).



Figure 1-3

If you are using CDs, you should check all the remaining CDs, by pressing the Test button each time. When all of the CDs or the DVD has 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 the DVD (or skipped the test altogether), the Fedora 2 installer program, called *Anaconda*, begins, launching the graphical installer. It tries to detect the video card, monitor, and mouse.

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 in Figure 1-4. Press **Next** (in the bottom-right corner) to continue to the next screen.

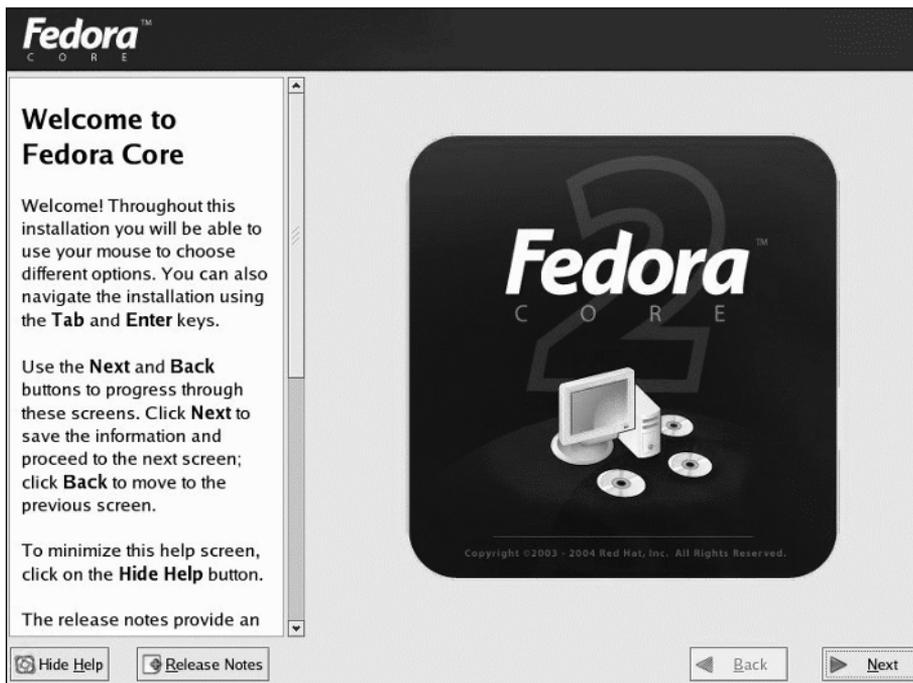


Figure 1-4

Selecting the Default Language

Fedora supports many languages other than English during the installation process. Those more comfortable with their native language can use the screen shown in Figure 1-5 to select a different language.

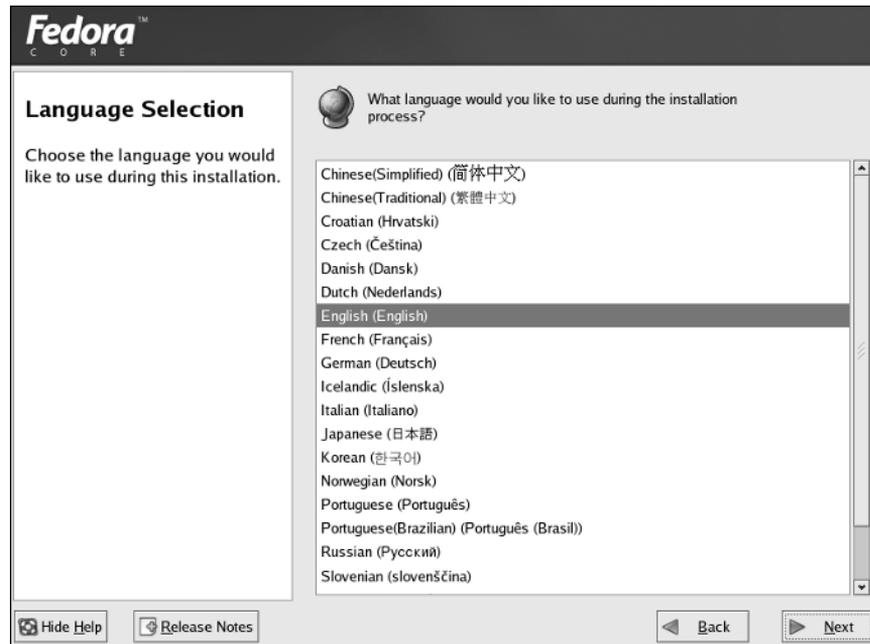


Figure 1-5

Note that many languages, notably those using various Asian Indic scripts, are missing from this list. The GUI toolkit used for developing the installation, GTK+, doesn't support the display of these languages. Fedora developers are 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 a future version of the distribution.

Selecting the Keyboard

For many non-English speaking countries, language-specific keyboards are available for the computer. These keyboards facilitate typing in the native language. Fedora 2 allows you to specify the keyboard layout of your choice, as shown in Figure 1-6.

Choose your preferred keyboard option (the screenshot shows a user selecting the default keyboard layout, U.S. English), and click Next to proceed to the next screen.

Selecting the Mouse

In the next screen, shown in Figure 1-7, Red Hat shows the list of mouse types that it supports.

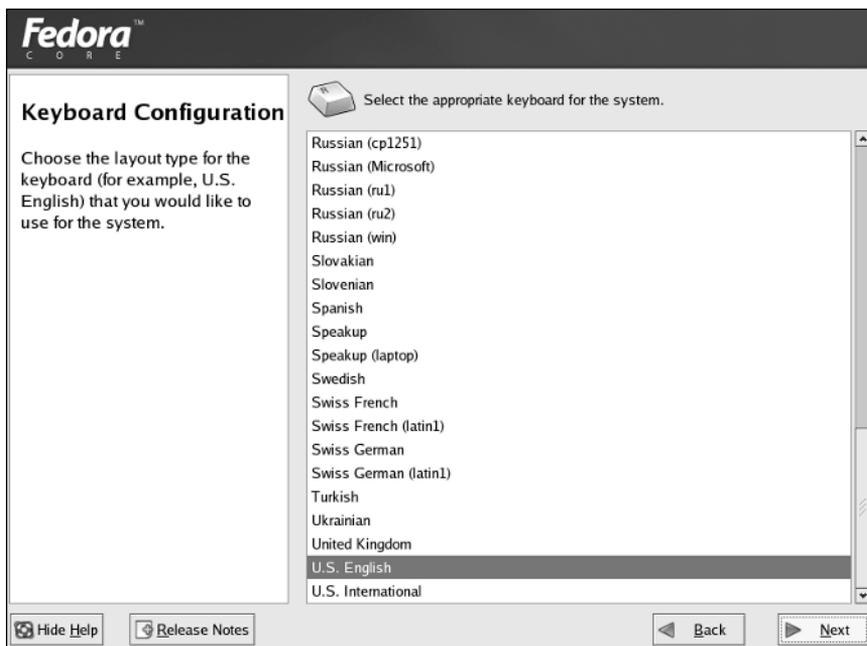


Figure 1-6

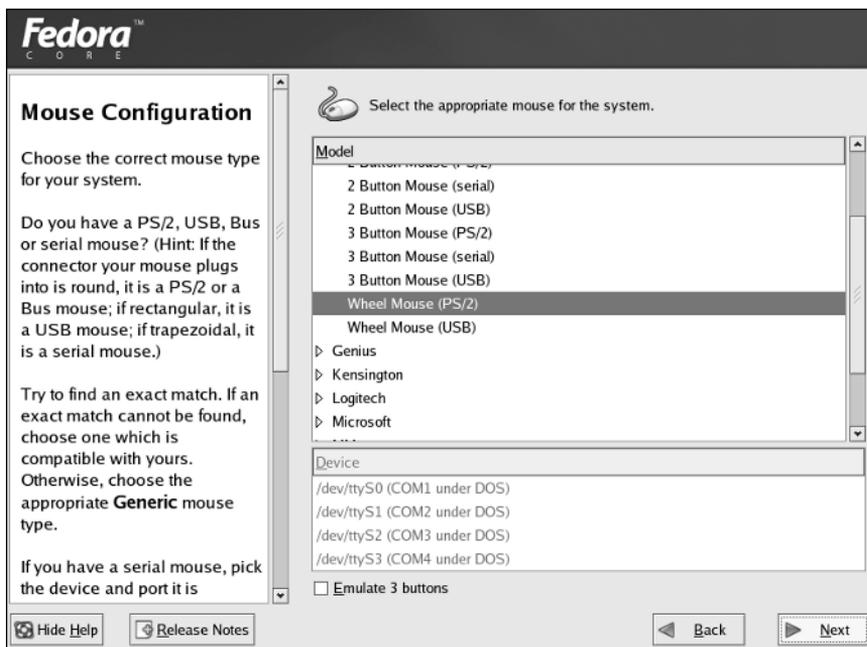


Figure 1-7

Fedora 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 looks for an existing version of Fedora on your machine. If it finds one, it will invite you to choose between *upgrading* the existing version and *replacing* it. An upgrade takes less time, and allows 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.

As mentioned at the beginning of this chapter, we will use a Personal Desktop installation for our machine. So, select the Personal Desktop option (see Figure 1-8), and click Next to proceed to the next screen.

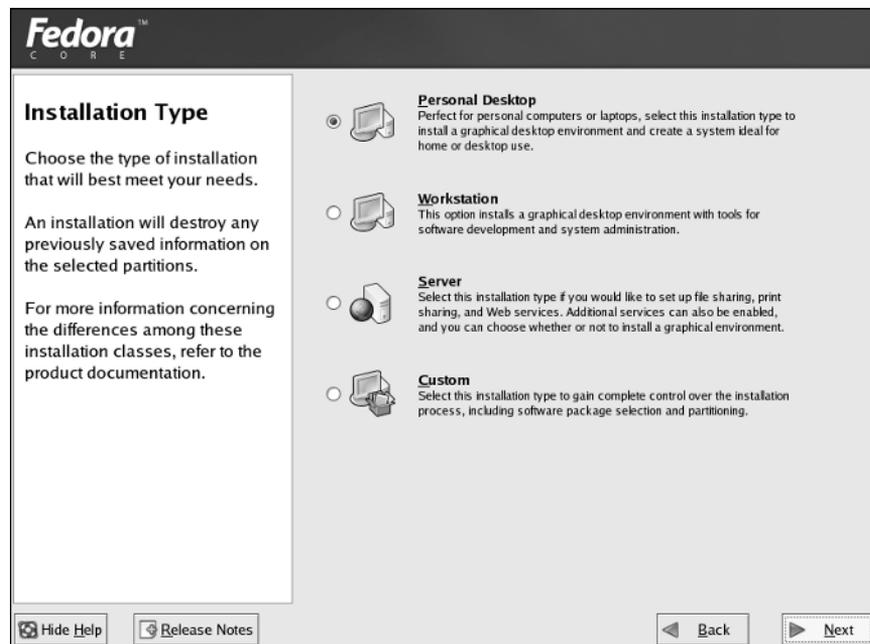


Figure 1-8

Setting Up the Disk Partitions

The next screen allows you to organize the storage space on your machine's hard disk (see Figure 1-9).

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.

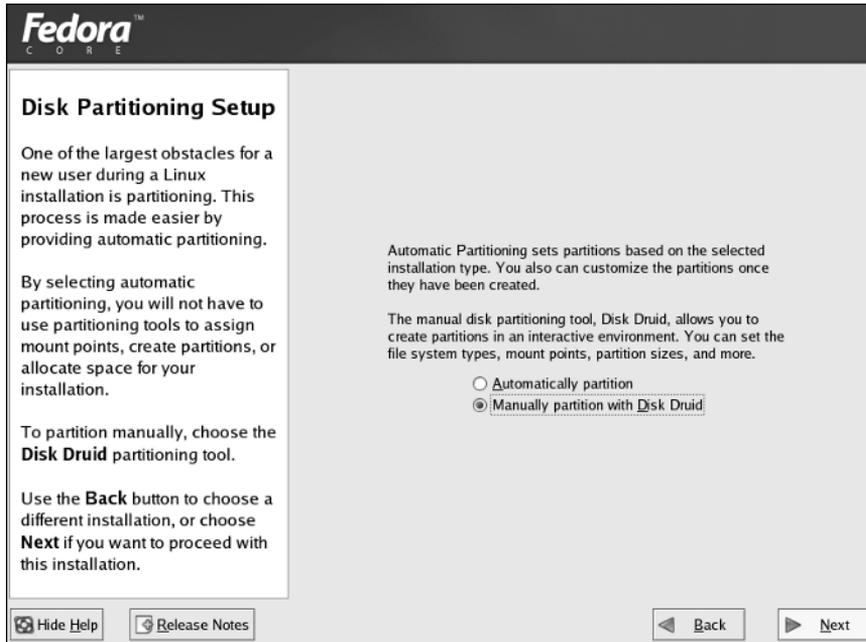


Figure 1-9

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 Fedora 2 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, Fedora 2 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.

Fedora 2 also offers an option for creating partitions manually, and if you feel comfortable and confident with creating your own partitions, 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.

Installing a Dual-Boot System

Read this section only if you wish to install Fedora such that both Fedora and Microsoft Windows co-exist on the same machine; if not, skip to the next section, "Dealing with Existing Partitions."

WARNING: If you intend to install Fedora 2 on a computer such that it co-exists with either Microsoft Windows 2000 or Microsoft Windows XP, you may run into a bug that could corrupt your computer's Master Boot Record (MBR). Please read the advisory on this issue posted on the Wrox Web site (www.wrox.com) before you proceed any further.

Some of us may want to install Fedora on a computer such that it coexists with another operating system. This is what is known as a dual-boot setup. At boot time, you are presented with a choice of operating systems to boot into. A typical dual-boot system consists of a Microsoft Windows operating system coexisting with a Linux system.

You need to set up the partitions on your hard disk before you can install a dual-boot system. Here are the steps to follow:

1. First of all, you need to make space for the Fedora installation. Typically, Microsoft Windows is already installed on the machine, resulting in a couple of scenarios:

SCENARIO A: Entire hard disk is occupied by Microsoft Windows partitions: In this case, you need to ensure that there is enough space left on the machine to install Fedora. If the Microsoft Windows installation has multiple partitions, be prepared to give up one or more of them to make space for the Fedora installation. This means copying files from these partitions to the ones that you intend to keep. For example, if the system had a 40GB hard disk, partitioned into drives C: and D:, each a 20GB partition, you could copy all the files from D: to C: to make way for Fedora on the partition currently occupied by drive D:. *Caution:* Remember that all contents of D: in this case will be lost forever once Fedora is installed on that partition. If you do not have enough space to copy all of the content of the second drive (D:, in this case) to the first drive (C:), you may want to use a re-partitioning program such as Partition Magic(www.powrequest.com/partitionmagic/) to re-partition the hard disk without loss of data.

SCENARIO B: Hard disk has Microsoft Windows partitions and some unpartitioned space: In some cases, there may be unpartitioned, free space on the disk. If enough space is left on the system that has not yet been partitioned as a Microsoft Windows drive, you would not need to copy files and free up partitions. You can check the free space information either during the Fedora installation process or from Microsoft Windows. For example, to check the free space available on a drive on Microsoft Windows 2000, go to Start Menu ⇨ Programs ⇨ Accessories ⇨ System Tools ⇨ System Information. Expand Components ⇨ Storage ⇨ Drives and check for the free space available on the drives.

2. Continue with the Fedora installation as previously described. Once you get to the point where the drives need to be partitioned, you need to take appropriate action based on your hard disk layout.

SCENARIO A: If your hard disk layout resembles Scenario A from Step 1, choose the Manually partition with Disk Druid option (see Figure 1-10) and click Next. Go to Step 3.

SCENARIO B: If the hard disk layout resembles Scenario B from Step 1, choose the “Automatically partition” option, as shown in Figure 1-11. Go to Step 3.

3. **SCENARIO A:** Figure 1-12 shows a typical layout for this scenario. The hard disk `/dev/hda` has two partitions, `/dev/hda1`, which in this case is the Microsoft Windows C: drive, and `/dev/hda2`, the D: drive, which in this case has been freed up to install Fedora on. You need to delete `/dev/hda2` so that the space used by it is freed up for creating the Fedora partitions. You can delete `/dev/hda2` by highlighting the line corresponding to `/dev/hda2` and clicking the Delete button. Go to Step 4.

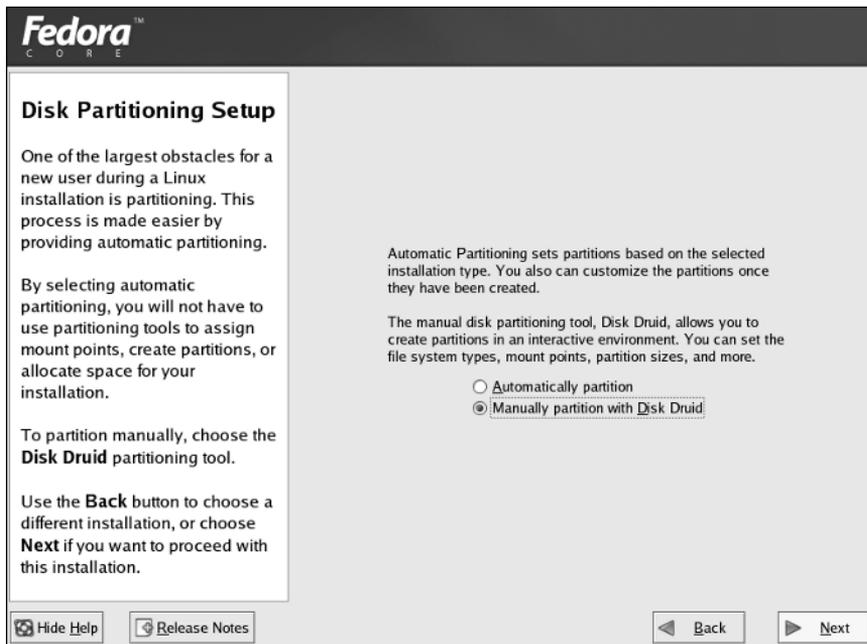


Figure 1-10

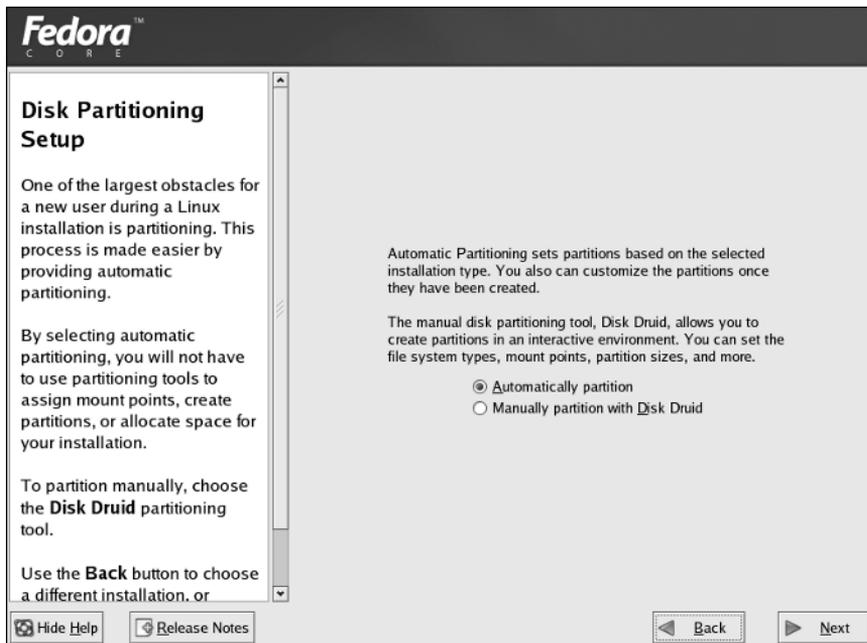


Figure 1-11

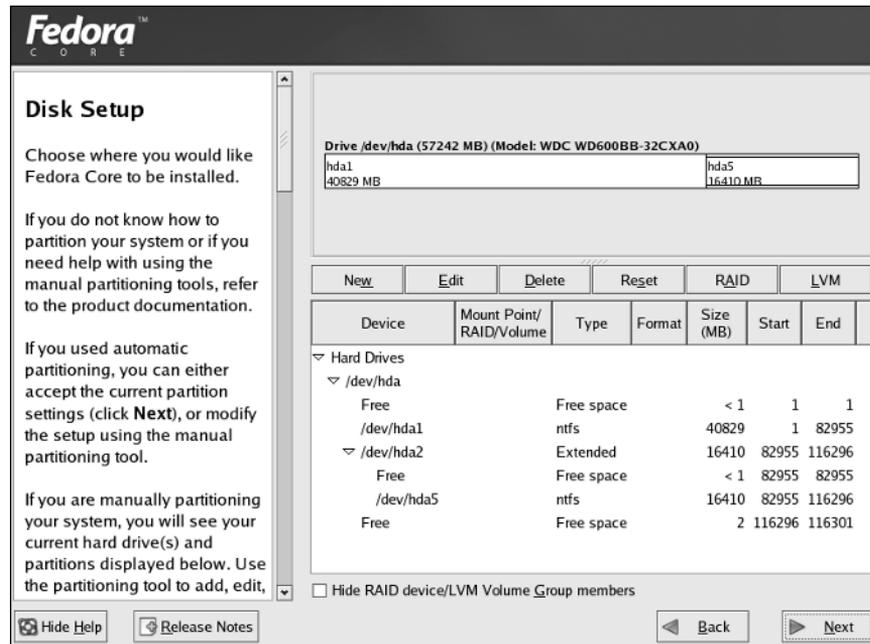


Figure 1-12

SCENARIO B: Choose the “Keep all partitions and reuse existing free space” option and click Next, as shown in Figure 1-13. Accept all the default options until you get to the boot loader screen. In other words, you may skip the rest of this section and go on to the section titled “Setting Up the Boot Loader.”

- SCENARIO A:** Now you need to create partitions for Fedora to use. Fedora needs at least two partitions, one for the operating system files, also known as the *root partition*, and a second partition known as the *swap partition* for storing some system runtime information when Fedora Linux is booted. Start off by creating the swap partition. To create a new partition, click the New button and specify the File System Type as swap from the drop-down menu (see Figure 1-14). For size, the general rule of thumb is roughly twice the size of the physical memory. So, if you had 0.5GB of RAM, you would allocate a swap partition of 1GB.

After you finish, a new entry for the swap partition should be created, as shown in Figure 1-15.

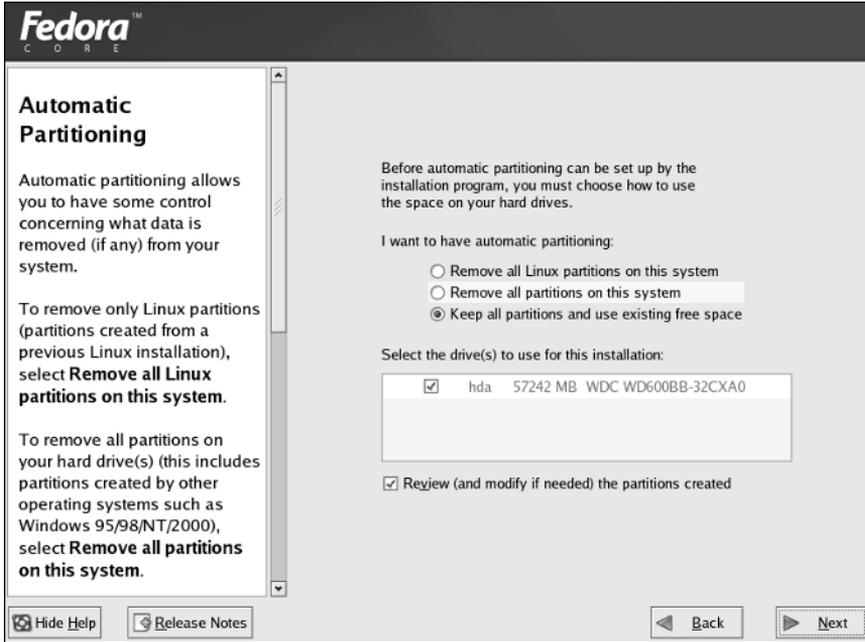


Figure 1-13

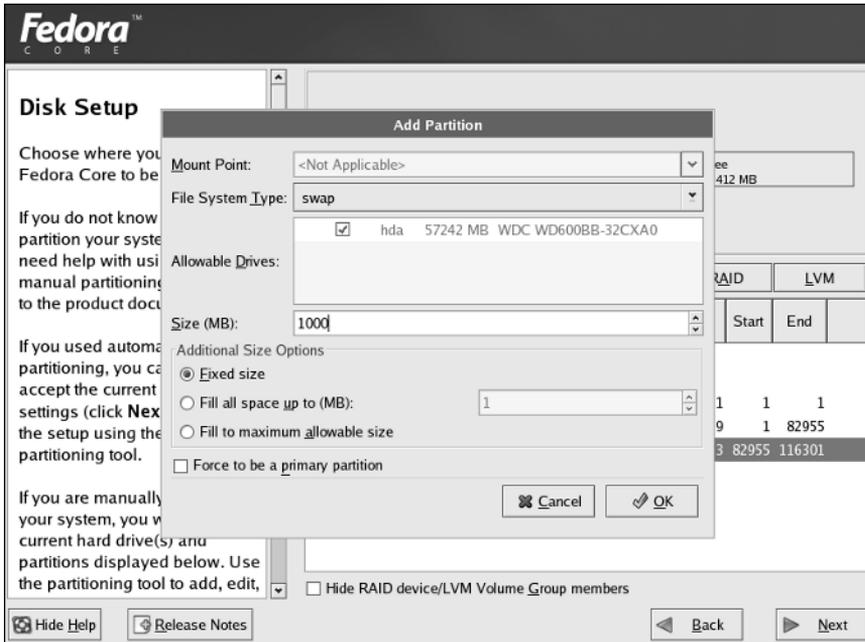


Figure 1-14

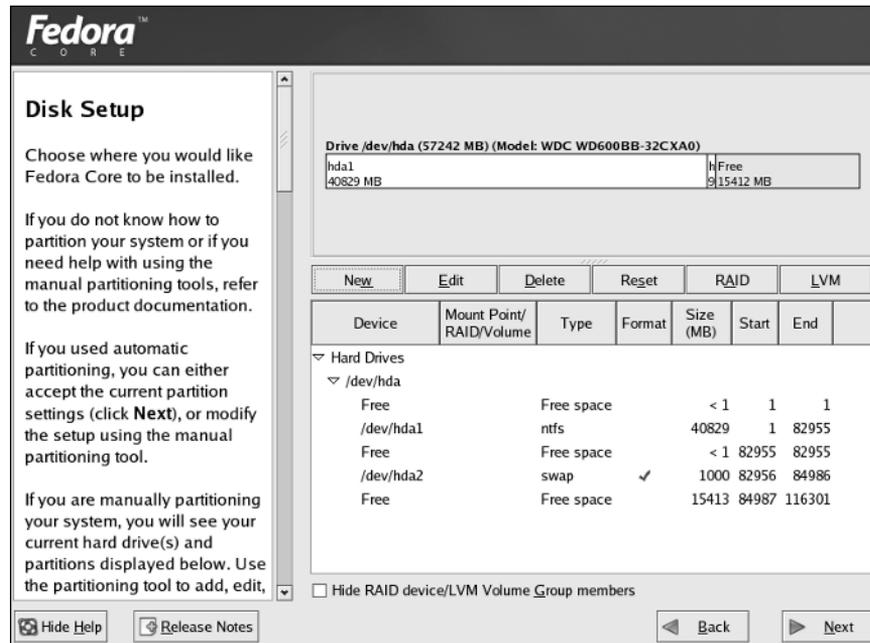


Figure 1-15

5. **SCENARIO A:** Now you need to create the actual partition for the Fedora files to reside on, that is, the /root filesystem. As before, click **New**, but this time choose **ext3** as the File System Type. You can specify the option “Fill to maximum allowable size” to allow the rest of the disk to be used (see Figure 1-16).

This should result in a screen resembling the one shown in Figure 1-17.

Click **Next** until you get to the screen that says **Boot Loader Configuration**. Once you get to this screen, skip to the section of the chapter titled “Setting the Boot Loader.”

Dealing with Existing Partitions

You may skip this section if you are installing a dual-boot system (as explained in the previous section).

If you already have partitions on your disk, you can use the screen shown in Figure 1-18 to remove the older partitions.

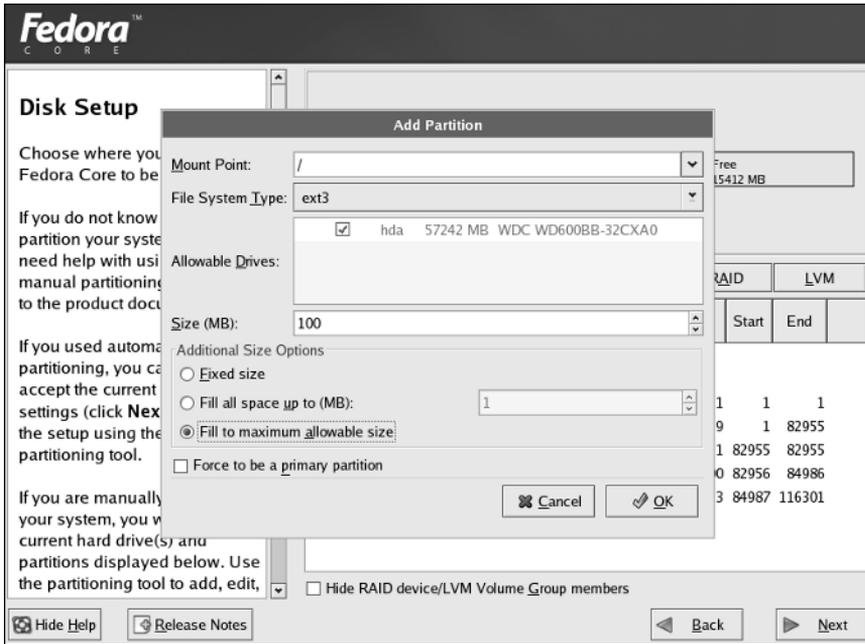


Figure 1-16

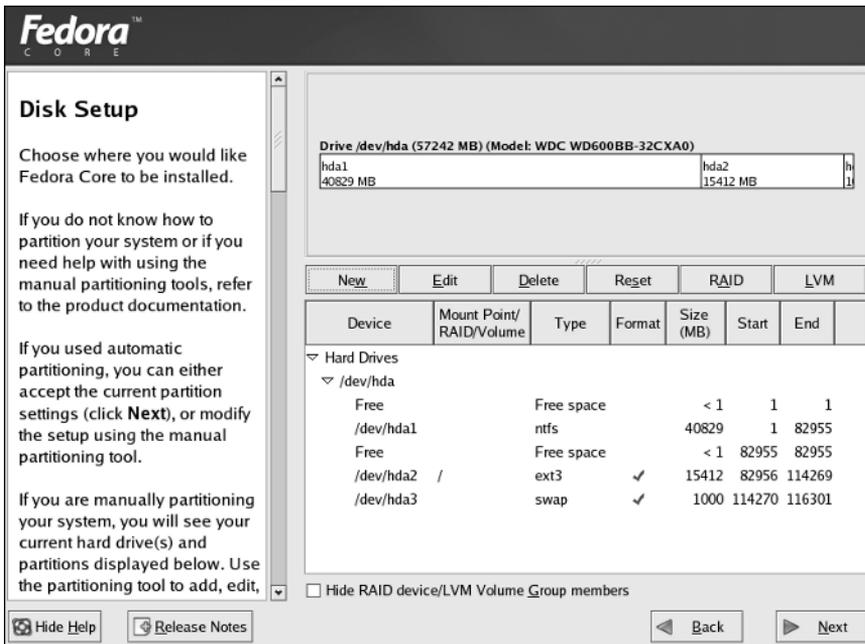


Figure 1-17

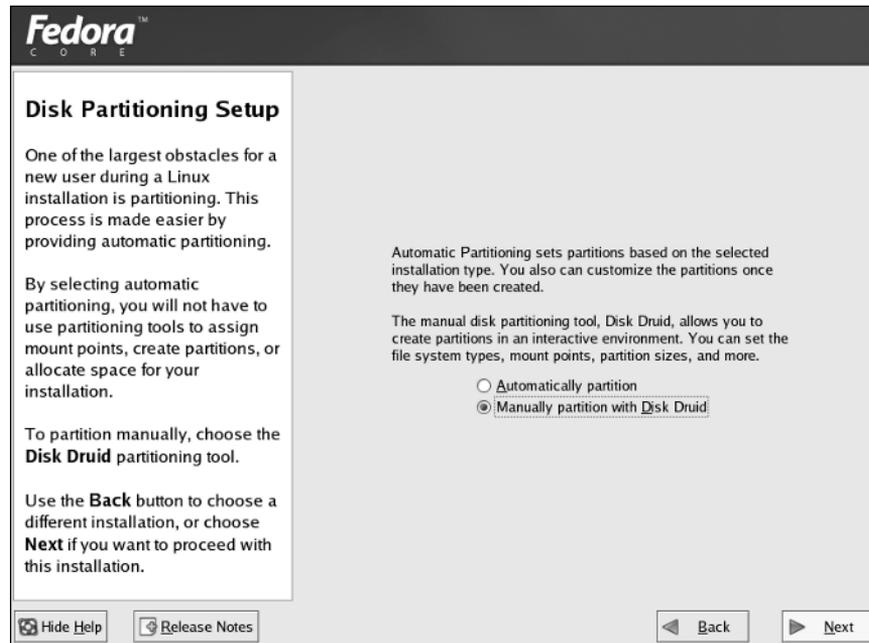


Figure 1-18

Unless you have data left on the disk, it is normally safe to accept the removal of existing partitions on the disk, by clicking the Next button.

If your machine has an existing Windows partition that you want to keep, 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, such as PartitionMagic, to create some free space onto which you can install Fedora 2.

If you have existing partitions, and you have asked Fedora 2 to remove them for you, you will be asked to confirm your desire to remove the partitions (see Figure 1-19).



Figure 1-19

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, Fedora 2 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 (see Figure 1-20) provides you with an option to specify the *default* operating system to boot from.

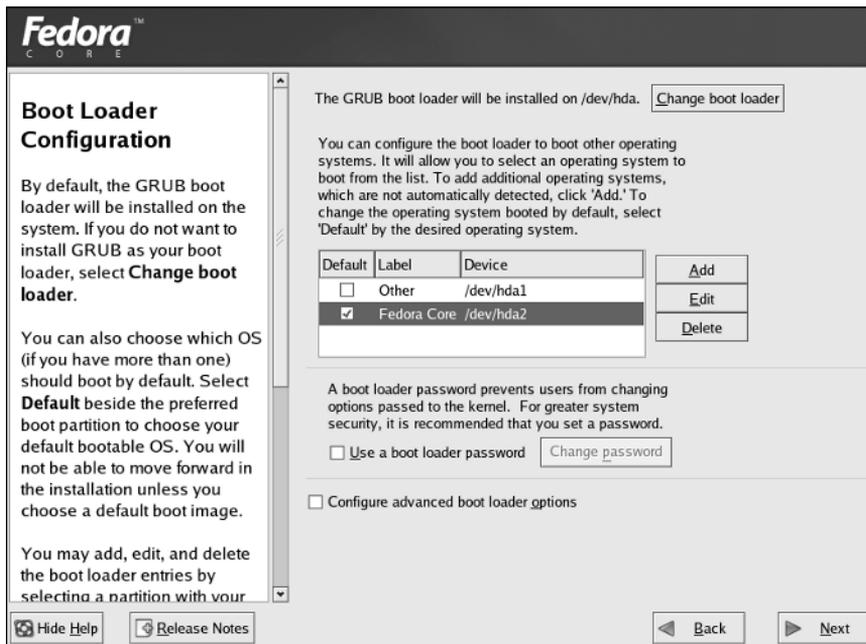


Figure 1-20

In this example, you see two options: Fedora Core and Other. The Other entry represents the Microsoft Windows OS installed on the machine. If you have only Fedora installed on the machine, you would see only the Fedora Core option. If you have the Other entry, you can click Edit and change the name of the option to something more intuitive, such as "Windows XP" or "Windows 2000."

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 entire 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.

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 (see Figure 1-21). Your network configuration checklist will come in handy in this section.

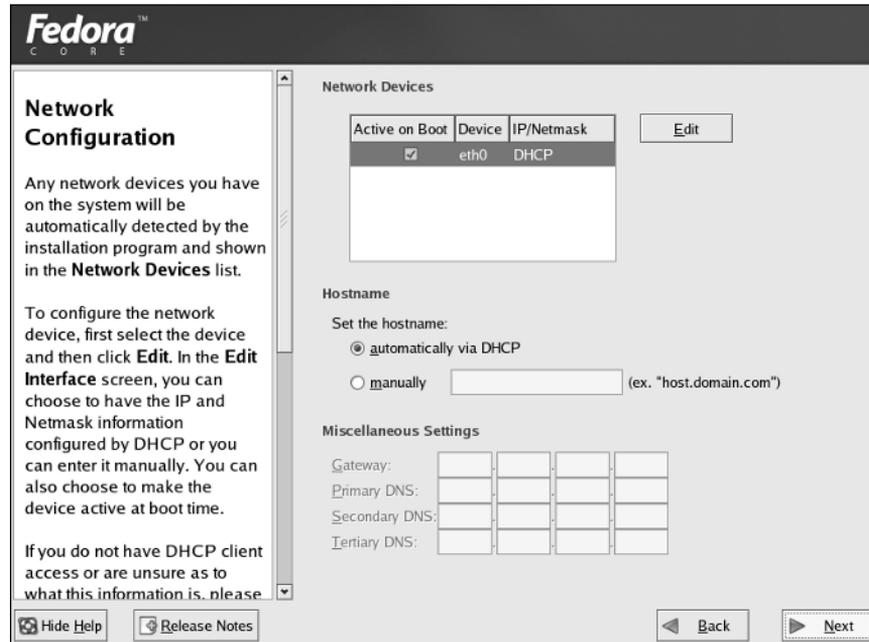


Figure 1-21

Note that if Fedora 2 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 box (Main Menu ↻ System Settings ↻ Network).

By default, Fedora 2 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, 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, 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 box.

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 the Edit button at the top section of the screen to bring up the network device configuration dialog box (see Figure 1-22).

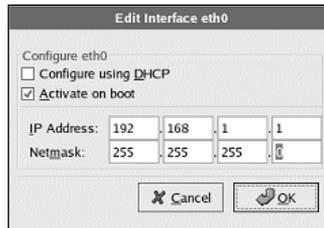


Figure 1-22

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.

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 hackers in the network; you'll learn more about configuring firewalls in Chapter 12. For now, Fedora 2 provides you with two options for network firewall security:

- ❑ **Enable firewall:** This option 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.
- ❑ **No firewall:** If you are unlikely to connect to the Internet, or if you are not concerned with hackers and malicious programs, you can select this option (see Figure 1-23). 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.

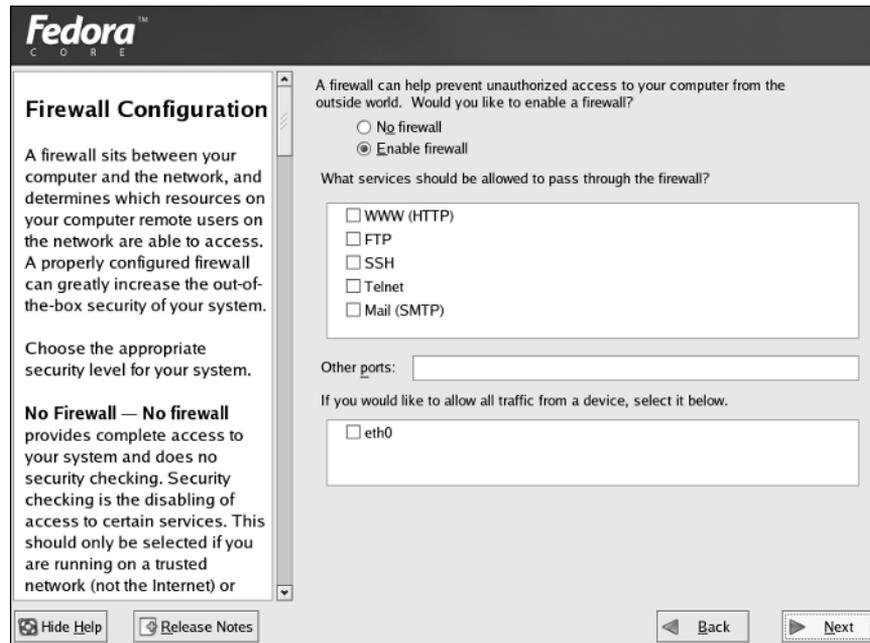


Figure 1-23

You can also customize the firewall rules within these different levels of security. Fedora 2 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:

- Secure Shell (SSH) 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 (see Figure 1-24).

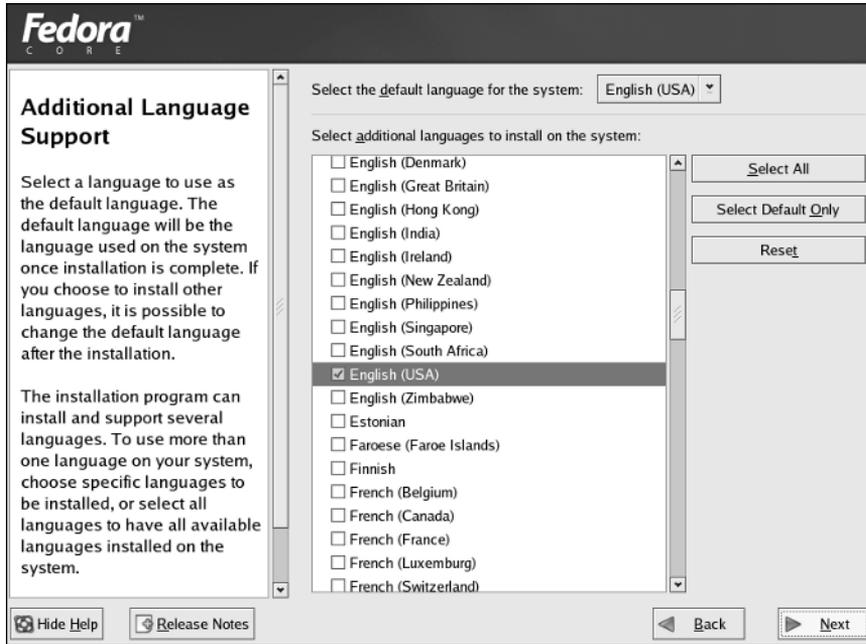


Figure 1-24

Generally, it is safe to continue to the next screen after accepting the defaults that are offered by the Fedora 2 installer.

Setting the Time Zone

In the next screen (see Figure 1-25), you can set the time zone of your location.

Fedora provides a very usable graphical method for selecting your time zone. To use it, bring your cursor to any point on 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 preceding screenshot, 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 time zone and daylight saving changes. (Note that you shouldn't use this if you have a dual-boot machine that also boots Windows.)



Figure 1-25

Root Account Configuration

By default, the installation process creates a single administrative user account for your machine, called *root*. You'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 super user) is no different in this respect. In the screen shown in Figure 1-26, you are asked to supply the root user's password.

You are asked to type the password twice, to confirm that you didn't mistype the first time.

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 super user account. Password security (and the techniques that people use for breaking passwords) is discussed in greater detail in Chapters 8 and 12.

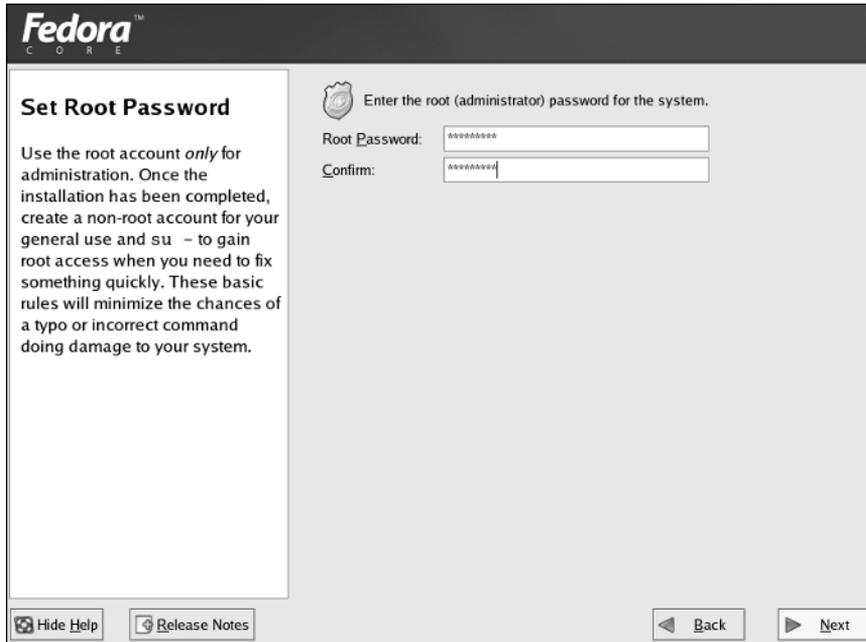


Figure 1-26

Selecting Packages for Installation

Now, you have an opportunity to choose the software packages that you want installed along with the system. Fedora 2 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 software packages to be installed” option (see Figure 1-27).

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 you’ll see in Chapter 4. So, to keep things simple, select the Accept the current packages list option here, and proceed to the next screen.

The Automatic Installation Process

The Fedora 2 graphical installation tool has now collected all the information that it needs to begin the installation. The next screen, shown in Figure 1-28, prompts you to begin the software installation.

The software package installation is mostly automatic; the only thing you need to do at this stage, if you are using CDs, is change the CDs a couple of times (when prompted to do so) and admire the photographs that are displayed while the necessary packages are installed.

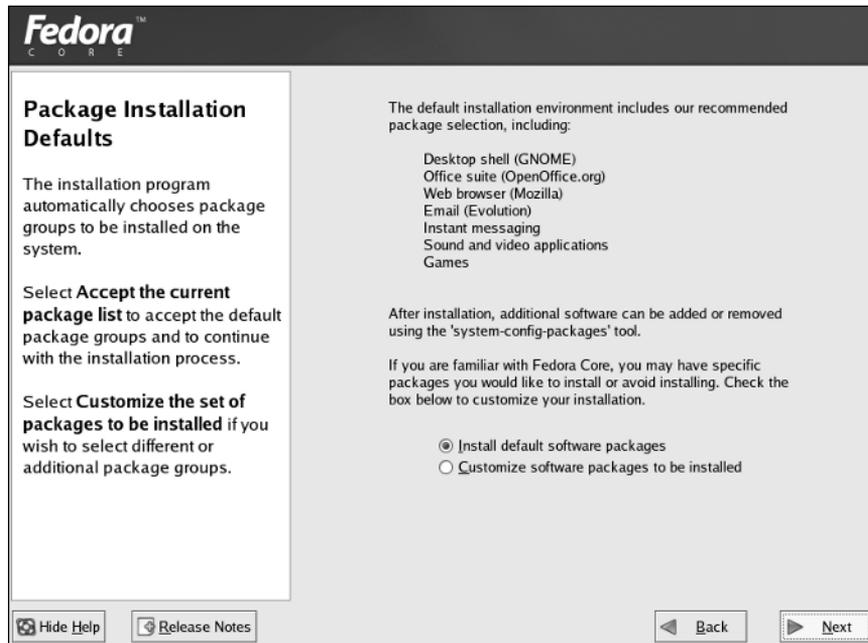


Figure 1-27

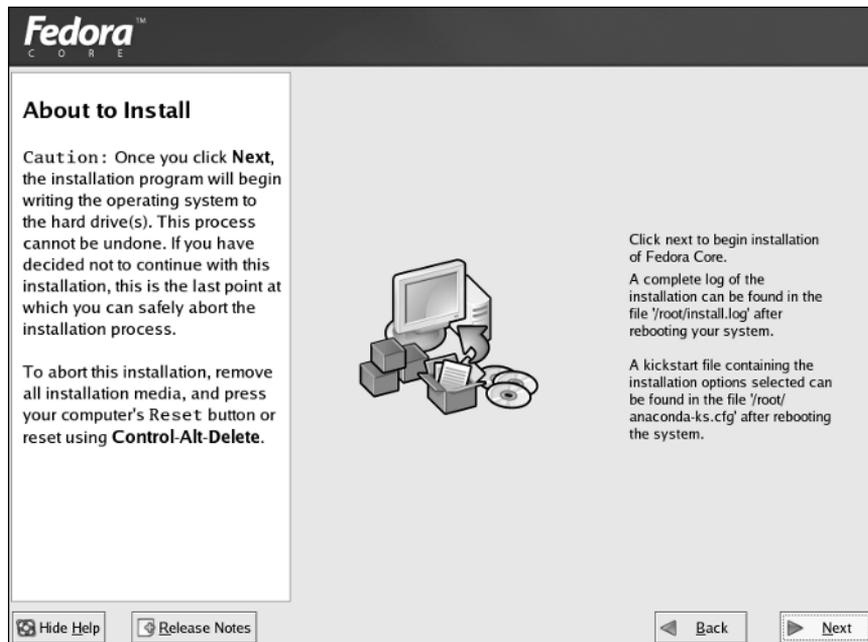


Figure 1-28

Before the software is installed, the installation process formats all the partitions that are supposed to hold these programs. Then, the installation process continues as the software packages are installed. Progress bars display the total time taken so far, and the estimated time of the software installation (see Figure 1-29).



Figure 1-29

Creating a Boot Disk

With all the software packages installed, we go to the screen where 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 Fedora 2 boot loader, GRUB; if that happened, it would be impossible to boot back into Linux. The boot disk helps you 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.

Finishing

This completes the installation of the Fedora 2 operating system. Now, you need to remove any CDs or DVDs and floppy disks from their respective drives, and click the Reboot button to reboot the machine (see Figure 1-30).

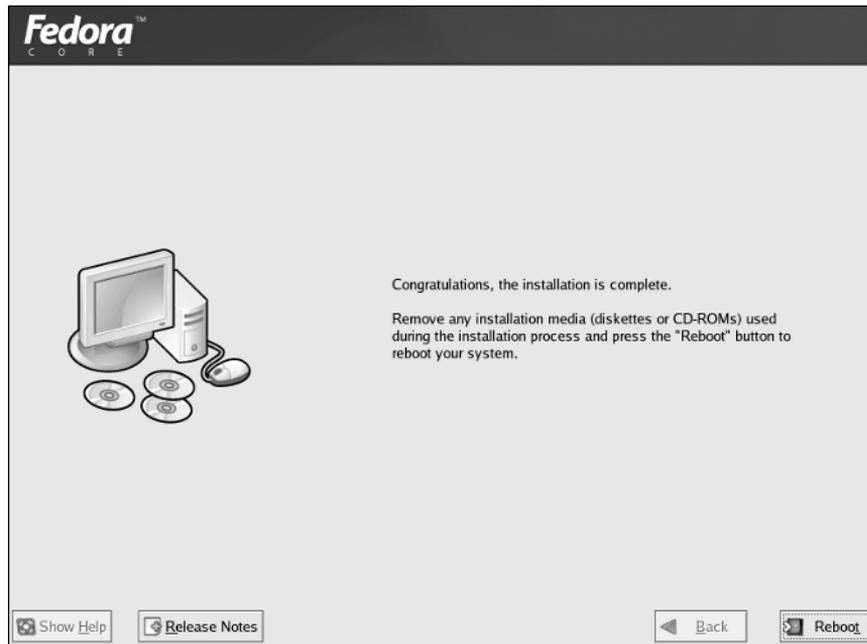


Figure 1-30

Booting Up

When the computer restarts, the boot loader takes over initially.

The boot loader shows the available operating systems to boot from. If you have a dual-boot machine, you would be presented with the choice of booting into either of the operating systems, that is, Microsoft Windows or Fedora. You can change the default choice using the arrow keys. The selected operating system will be booted automatically within a few seconds; you can hasten the process by pressing the *Enter* key. If you choose Fedora, this screen should be followed by a long list of rapidly moving text messages, as Fedora 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

Chapter 1

- ❑ Configuring the system for the Red Hat Network
- ❑ Selecting additional distribution software or documentation to be installed

The Welcome screen (see Figure 1-31) shows the list of parameters to be configured. Click Next to move on to the first of these screens.



Figure 1-31

Setting the Date and Time

Next, check (and, if necessary, set) the date and time for the computer (see Figure 1-32).

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 at www.ntp.org.

Display Settings

Normally, Fedora does a good job of automatically detecting the best resolution and color depth for your display. If you are dissatisfied with automatic settings, you can change the resolution and color depth of your screen display by choosing one of the options from the drop-down menus (see Figure 1-33).

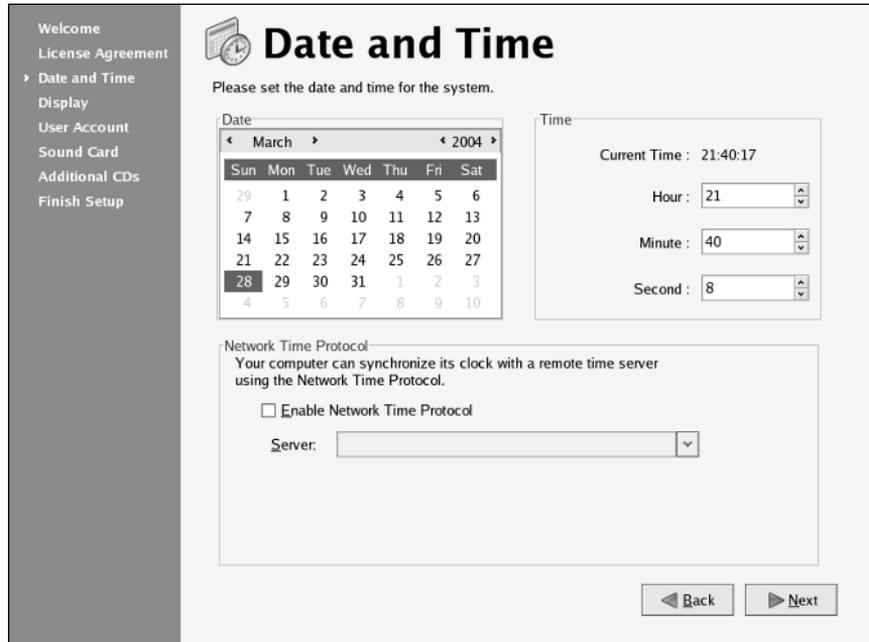


Figure 1-32

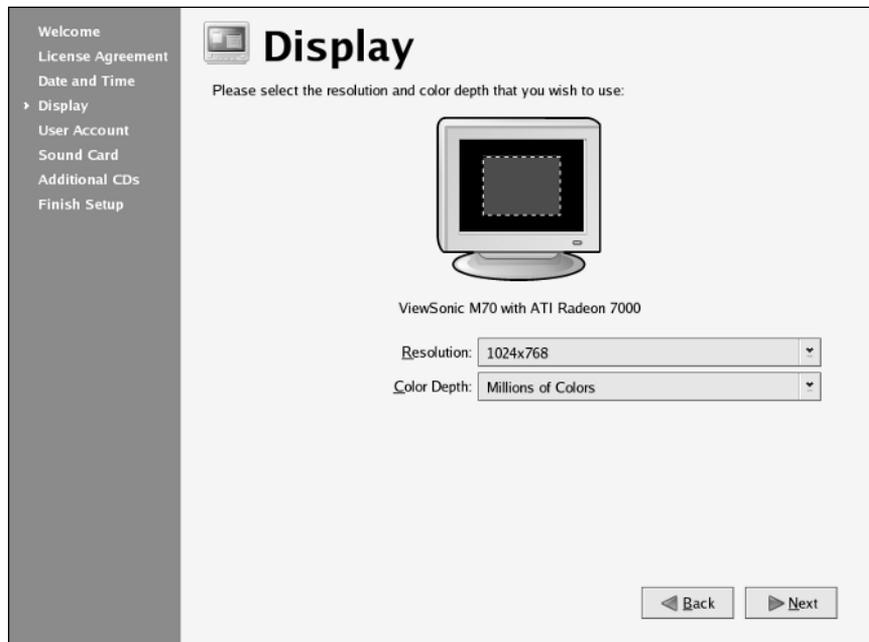


Figure 1-33

Creating New User Accounts

We've already talked a little about the root user account—this is an administrative (or “super user”) 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, we recommend that you create a “normal” (non-administrative) account for your personal use, and use that most of the time.

The following screen (see Figure 1-34) allows you to do that; you just need to choose a username and password, and (if you like) type your full name, too.



Figure 1-34

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

Sound Card Settings

In this screen the sound card is tested to ensure that it works (see Figure 1-35). Click “Play test sound” to verify that the sound card does work under Fedora 2.

Installing Additional Software

You've already had one opportunity to install additional software and documentation from the range of material available on the Fedora Web site, and now you get another chance (see Figure 1-36).



Figure 1-35



Figure 1-36

Chapter 1

If you have a documentation CD, it's a good idea at this stage to install the documentation contained within it (that's the top Install button). The subsequent dialog boxes 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 you'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 Next one last time (see Figure 1-37).



Figure 1-37

Logging In

In the login screen, you'll be prompted for a username. Type the username you created earlier. Here, we'll use the `dthomas` account we created a few pages back.

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 Fedora 2 is the *GNOME* desktop. You'll see a user interface like that shown in Figure 1-38, with icons in the top-left corner, and a panel at the bottom.

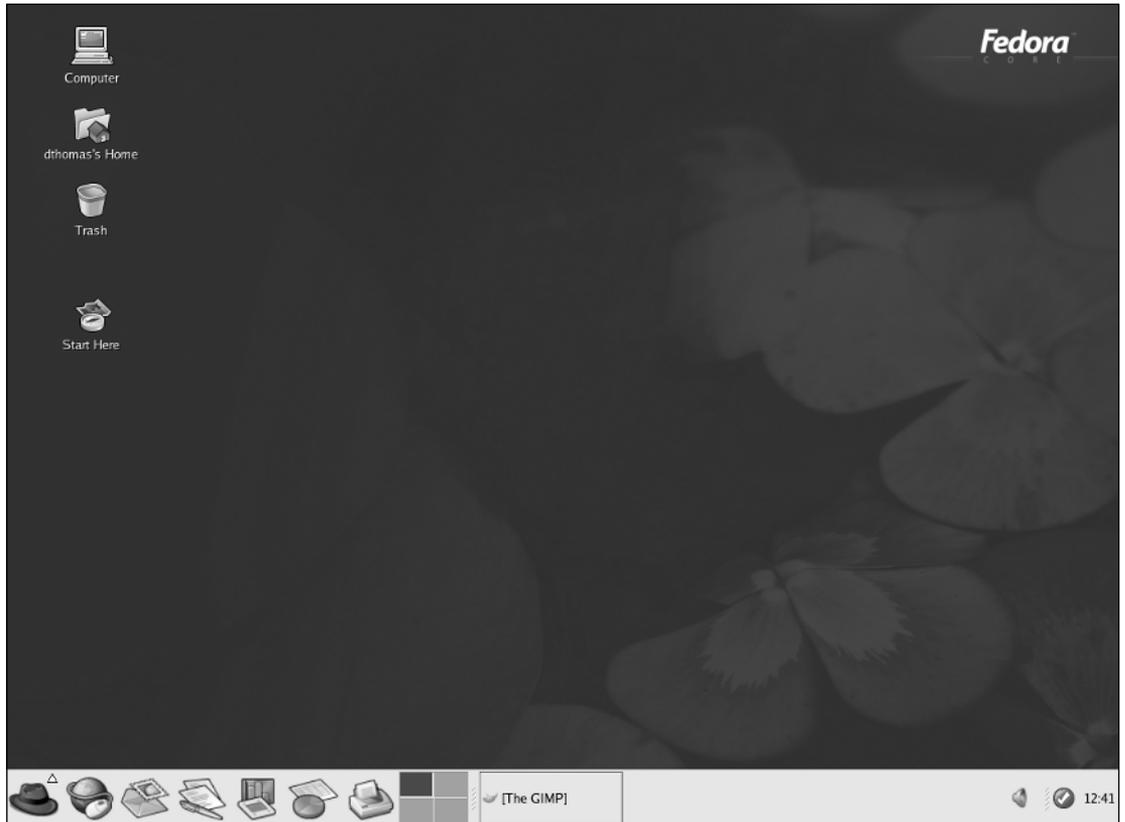


Figure 1-38

The installation is complete, and you're ready to start using the graphical user interface to start making the most out of your Fedora 2 operating system. We'll begin to explore it in the next chapter. Optionally, you may want to go to Chapter 8 to install additional programs and updates to the operating system.

Summary

This chapter looked at the various steps for installing the Fedora 2 operating system.

We began by noting that the installation process requires various pieces of background information about the hardware and network configuration of the computer, and we compiled two checklists of information. The Fedora 2 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, although 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 this chapter demonstrated).

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, you can reconfigure them using the dialog boxes 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, selecting a password for the root user, and adding any additional software you 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 desktop's GUI, and reboot the machine, and this completed the initial installation of the Red Hat operating system.

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

The next chapter looks at how to use the freshly installed desktop. It covers important concepts such as the file hierarchy and devices, which will help you to work effectively in Linux. It looks at various components of the desktop and how to customize them, and explains how to check the hardware configuration of the machine and how to manage and control processes in the system.

Exercises

Now that you have installed Fedora, here are some exercises for you to try.

1. If you add new hardware to your system, how do you configure it?
2. When you switch on a computer on which you've installed a dual-boot system, the boot loader will show you two options to boot into. If you do not choose, it will boot the system into the default choice. How do you change the default choice?