Installing Fedora Core

In mid 2003, Red Hat spun off their mainstream Red Hat distribution into a true Open Source project called "Fedora Core". FC, as it's known, differs from Red Hat Linux in a couple of specific ways - first, you can only get it by downloading ISOs (or getting them from a friend), and second, it'll be updated on a regular basis, but strictly through Open Source means. Some have taken these changes to mean that FC will be unstable or otherwise unworthy of attention anymore, and thus have been reluctant to give it a try. That's not really fair - most people think that FC is on a par with where "Red Hat 10" would have been at this time. Some people may not be convinced, so to give those doubting Thomas's in the audience a preview of what FC looks like, I use a liberal number of screen shots as well as detailed supporting explanations to show you how to install Fedora Core from scratch for desktop usage.

I was initially among the skeptics when I heard about Red Hat's plans for Fedora Core. Part of the reason was that they didn't do a very good job at providing a lifetime on the existing products - in fact, I had been preparing to buy a number of subscriptions for a couple of recent RH 9.0 purchases - and if I had, those would have been wasted dollars and I would have been an unhappy camper. Another part of my skepticism was that they didn't do a very good job at explaining what the differences between Fedora Core and their commercial products were - it took me months to determine how an update service was going to work, or, indeed, if there was even going to be one past manually applying patches to individual packages.

As it turns out, I didn't have anything to fear, and generally, you shouldn't either. The most difficult problem for me was burning CDs - after that, the installation was a rather nicer version of the comfortable Red Hat installs I'd been used to with 8.0 and 9.0 and I was up and running in a couple of hours, most of which was spent watching thermometer bars race across the screen.

The Big Picture

There are three basic parts to installing FC: downloading and creating CDs, the initial installation process, and final setup.

Fedora Core comes as a series of three ISO files, each about 650 MB in size. After downloading and verifying the files, you'll want to put them onto CDs. Most every version of Windows comes with CD-burning software, so I won't belabor that process here. It's not quite as straightforward on a Linux box, though, so I'll provide explicit details for creating CDs with Linux.

Once you've got your three CDs, it's time to install. The first CD is bootable, so, assuming that your machine can boot from a CD, you just stick it in and restart the machine. A wizard starts, first offering to check the CDs for errors, and then guiding you through about 16 screens that allow you to configure your machine and set up preferences. Most of these screens can be navigated simply by clicking "Next", as the wizard will detect and display the appropriate choice for you.

After completing the wizard, the installation starts, and you'll be prompted to insert CD #2 and #3 when necessary. Once all the files have been transferred and the system has been

installed, the machine will restart and you'll spend a few more minutes making a few last tweaks and choosing settings. Upon completion, you've got a Linux box ready to go.

The Details - Step by Step

In this section, I'll go through the exact steps needed to download, install, and complete the installation of Fedora Core on a desktop computer.

Downloading Fedora Core

There are three steps involved in downloading FC. First, download the ISO images from the Fedora website or from a mirror. Second, confirm the results - ensure that the images are good and didn't get corrupted during the download. Finally, burn CDs using the downloaded files.

Download the three ISO files

Fedora Core comes packaged as a set of three files with the extension of ".ISO". The file names differ according to which version of FC you're downloading; the names for Fedora Core 1 for Intel-based personal computers are

```
yarrow-i386-disc1.iso
yarrow-i386-disc2.iso
yarrow-i386-disc3.iso
```

In order to download them, go to

```
http://fedora.redhat.com/
```

and click on "Download" link on the left side. There are a set of instructions that you should read through first. You'll see a link under "Downloading the ISO images" labeled something like:

```
http://download.fedora.redhat.com/pub/fedora/linux/core/1/i386/iso/
```

but I suggest that you ignore this link as it gets a lot of traffic and your download speed could very well be slow. Instead, find the link lower in the section that says "mirror site". This link goes to a page listing a large number of copies of the original images - don't worry, they're exactly the same files, just stored on different computers ("mirrors") around the world.

These mirrors, while containing identical files, aren't all on identical machiens - some are heavy duty machines connected to the Internet with very fast connections, able to service many users at the same time; others have significantly smaller capabilities. There's not a tried and true formula for determinign which link will provide the best perofmrance for you - a low bandwidth link that you connect to in the middle of the night be faster than a high capacity link that a lot of people are hitting at 9 in the morning.

The instructions for mirros often suggest that you look for a mirror close to you, but I've found that looking for a link that is located somewhere where it's very early morning (3 to 6 AM) often provides the best results.

There are two types of links: HTTP and FTP. (We're going to ignore the lines that start with RSYNC because they require additional software that's beyond the scope of this discussin.) The results you get are pretty much the same regardless of which type you try, but you may have special software that works better with one than another. For example, if you click on an HTTP link, you may get a directory structure that looks like this:

```
Parent Directory
1/
development/
test/
updates/
```

Click on the "1/" link (the '1' stands for Fedora Core ONE), and you'll get to a second level with links like so:

```
Parent Directory
SRPMS/
i386/
```

Click on the i386 link, and you'll get yet another set of links, like so:

```
Parent Directory
debug/
iso/
os/
```

Click on the iso/ link, and you'll see a list of files like so:

```
MD5SUM
yarrow-SRPMS-disc1.iso
yarrow-SRPMS-disc2.iso
yarrow-SRPMS-disc3.iso
yarrow-i386-disc1.iso
yarrow-i386-disc2.iso
yarrow-i386-disc3.iso
```

You want the 'yarrow-i386' files, not the 'yarrow-SRPMS' files. Click on the first file (disc1). Depending on the type of connection (HTTP or FTP) and the type of software you've got installed on your machine, you will either get a dialog that says "What do you want to do with this file?" and provide options for opening it with a program of your choice or saving it to disk, or launch your FTP program.

Note that these files are really big - about 630 MB each. Even with a T1 connection, it'll take a while to download all three files - and you'll need nearly two GB of free disk space. At this point, I'll assume that you're able to download and save to disk all three ISO files.

You'll also want to download the MD5SUM file in the same directory, and save it alongside your three ISO files. It's only a few hundred bytes long, and is simply a text file.

Verify that the bits came down properly

Just because you've got three ISO files sitting in a directory somewhere doesn't mean that everything is hunky dory. Remember that these files are simply carefully arranged combinations of 1's and 0's - and that any number of events could have conspired to interrupt the flow of 1's and 0's to your computer. Thus, you'll want to make sure that the files you've got are the same as the files on the mirror. You use a program called "MD5SUM" to do so.

An MD5SUM check is a way of ensuring that two files are identical - that one didn't get corrupted or otherwise altered during downloading. Running the MD5SUM program on a file calculates a 128 bit text string (or "fingerprint") for that file that can be compared with the fingerprint of the original file on the server to ensure that both files are the same.

In order to use MD5SUM on a Linux machine, follow these steps:

1. Go to a terminal window
2. change to the directory that contains your ISO files
3. run the command

```
md5sum yarrow-i386-disc1.iso
```

It'll take ten to thirty seconds, depending on your processor.

4. You will get a response of text characters. Those characters should match the string on the http://fedora.redhat.com/download/ page:

```
yarrow-i386-disc1.iso (md5sum: 76ef22495d186580e47efd8d7a65fe6b)
yarrow-i386-disc2.iso (md5sum: fd23fe32fafe7557f5d1fa1d31100580)
yarrow-i386-disc3.iso (md5sum: 6a26b34069639d0c31465d4079a8e1b2)
```

You can also find a copy of the original string in the MD5SUM file that you downloaded along with the ISO files.)

5. Compare the two strings. If you don't get the same string, your file is corrupt (or illegitimate) and you need to get a new one. In Figure 1, the first ISO checked out OK, because the fingerprints are the same. However, the second one is corrupt - the original fingerprint begins with "fd23" while the fingerprint that MD5SUM calculated from the downloaded ISO file begins with "c8b5". Thus, the second ISO has to be downloaded again.

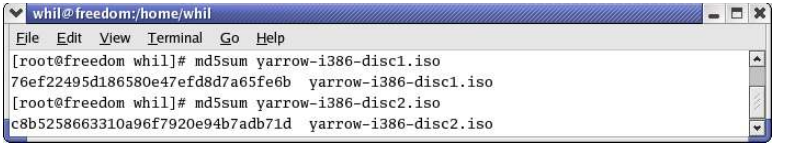

Figure 1. Verifying the MD5 sums for the ISO files downloaded.

Burn a CD

This step causes more questions than using the MD5SUM program. A common mistake is to simply copy the ISO file to a CD - but that's not the goal. The ISO file actually contains a number of other files that are to be placed on the CD so that they are accessible during

installation. If you simply copy the ISO file itself (so that doing a directory listing would result in a list of one file of 630 MB), booting with the CD will result in an error. The ISO file is an image of what will go on the CD, and so you'll use a special option in a CD burning program to convert that image into files that land on the CD.

There are three steps to this process: determine which device your CD burner is connected to, do a test burn, and then do the real burn.

1. Open a terminal window and become root

```
su
```

2. Enter the cdrecord command to determine which device

```
cdrecord -scanbus
```

3. You should see a slew of info as shown in Figure 2.

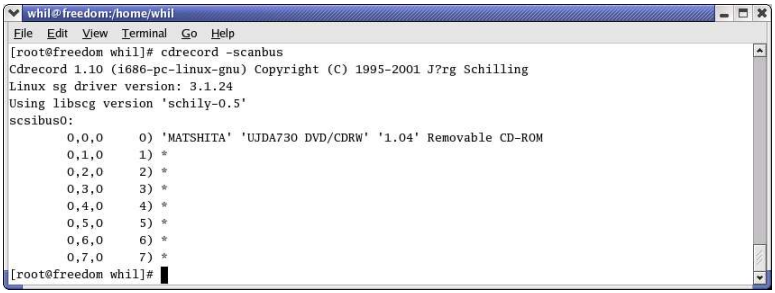

Figure 2. Determining the CD-ROM's address via the cdrecord -scanbus command.

The info dump includes a string like so:

```
0,0,0   0) 'MATSHITA' 'UJDA730 DVD/CDRW' '1.04' Removable CD-ROM
```

4. Next, issue the cdrecord command to do a test burn, using the three leading numbers from the results of the scanbus info dump, like so:

```
cdrecord -dummy -v -eject speed=4 dev=0,0,0 /path/yarrow-i186-disc1.iso
```

5. The results are shown in Figure 3.

Figure 3. Results of a test CDRECORD command.

6. If that goes well, then issue the following command to burn the real CD:

```
cdrecord -dummy -v -eject speed=4 dev=0,0,0 /path/yarrow-i186-disc1.iso
```

The results should look like Figure 4.

Figure 4. Results of an actual CDRECORD command.

Once you've burned your CD, take a look at the contents using a tool like Nautilus. Figure 5 shows what CD #1 should look like.

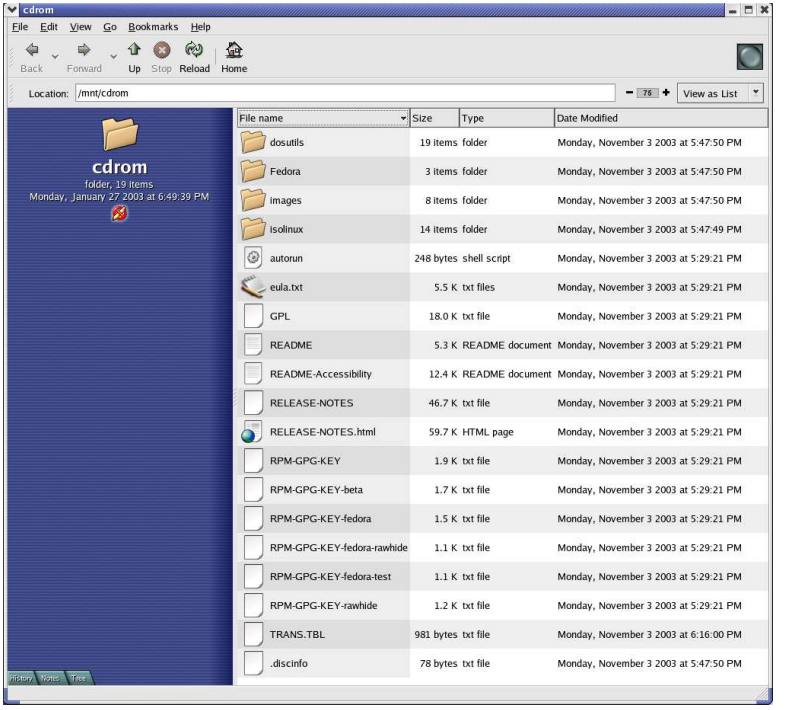

Figure 5. Contents of CD #1.

For your convenience, I've also shown what the contents of CD #2 in Figure 6.

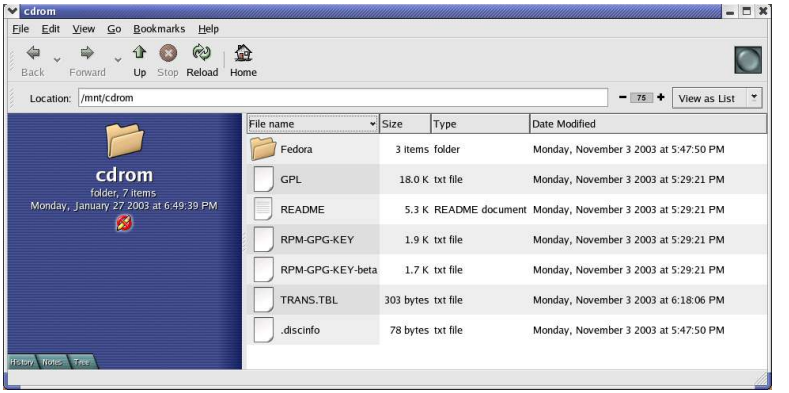

Figure 6. Contents of CD 2.

And CD #3 in Figure 7.

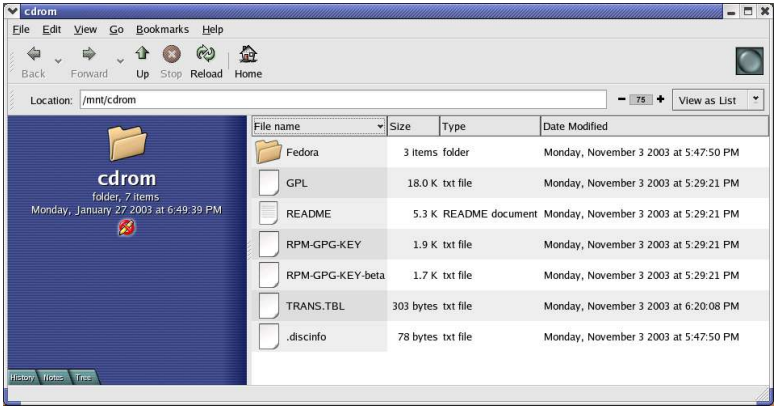

Figure 7. Contents of CD 3.

Now you've got three CDs with images of Fedora Core 1.

Installing Fedora Core

If you've installed RH 7, 8 or 9, the process will be very familiar - it's nearly identical to RH9, except there's the Fedora Core background in the installation dialogs. At this point, I'm going to assume you have 3 CDs with the images burned on them. (Fedora Core 1/2/3)

Prepare for Installation

Step 1. Stick the first CD in and boot the box. Feedback from the boot process will display, as shown in Figure 8.

Figure 8. Feedback from the boot process with Fedora Core CD 1 in the disk drive.

Then the install screen will display, as shown in Figure 9.

Figure 9. The initial Fedora Core boot screen.

Step 1a. The system will wait for you to either press the Enter key if you want to run the installation in graphical mode, or to type in a command at the boot: prompt if you need to do so. Some machines are persnickety when it comes to installing Linux (or maybe it's the other way around), and so require the installation to be run with one or more parameters. This is where you would enter those parameters. Once the installation process begins, you'll see a blank screen, as shown in Figure 10.

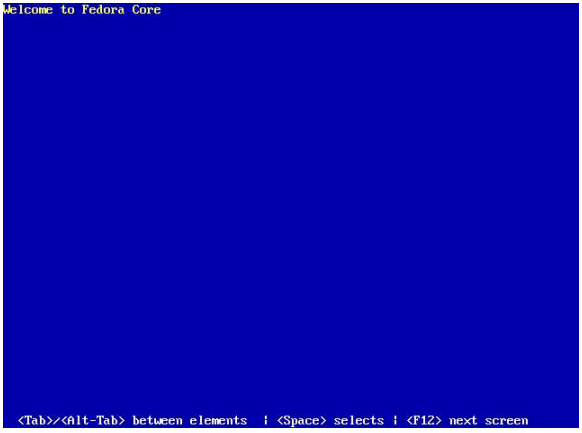

Figure 10. Booting takes a few seconds, during which a blank character based screen is displayed.

Step 1b. After a few seconds more, a character-based dialog asking if you want to test the CD media before installing displays as shown in Figure 11. The character based Media Check dialogs aren't mouse-enabled, so you'll need to use the left and right arrow and the Enter keys on your keyboard to select choices.

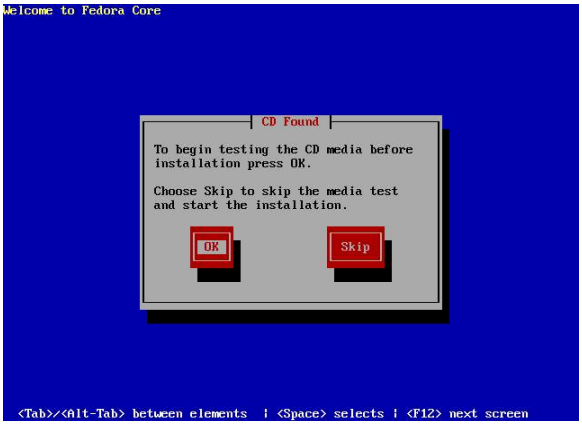

Figure 11. The CD Found dialog allows you to decide whether you want to check the CDs for errors before installation.

Step 2. If you select OK, continue reading at Step 3. Else, go to Step 5 and continue reading there.

Step 3. You' llget a second dialog, as shown in Figure 12, that offers two choices; one to test the CD currently in the drive, and another choice to eject the current CD and insert a different to be tested.

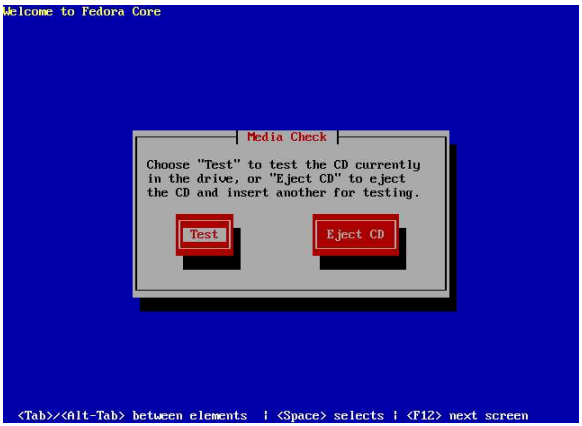

Figure 12. The second media check dialog offers choices to test the current CD or insert a different CD.

Step 3a. Whether you elect to test the current CD or eject the CD and insert another, you' ll soon enough be greeted by the Checking... dialog, as shown in Figure 13.

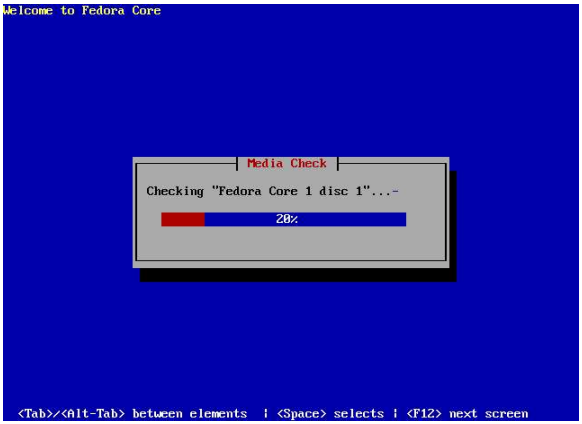

Figure 13. The checking dialog of the Media Check process displays the progress with a thermometer bar.

Step 3b. Once the media check is complete, the thermometer bar will sit at 100% for another 15-30 seconds, as shown in Figure 14.

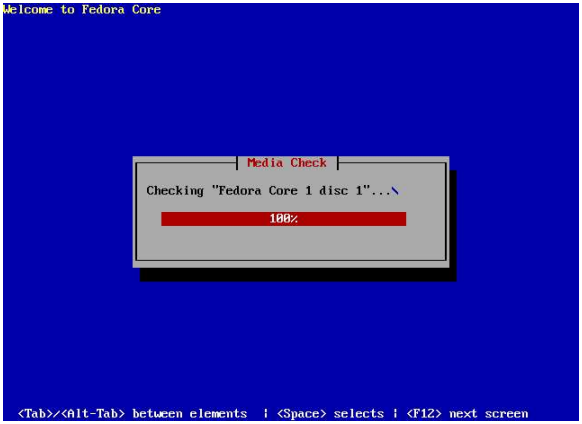

Figure 14. The thermometer bar will sit at 100% for a short period of time.

Step 3d. The media check dialog will display the results of testing the CD in the drive, as shown in Figure 15.

Figure 15. The results of the media check are displayed in a separate dialog.

Step 4. Click OK. You'll get a chance to test another CD or to continue on with the installation process, as shown in Figure 16. Selecting Test will cycle through Step 3 again while selecting Continue will continue the installation process, as described in Step 5.

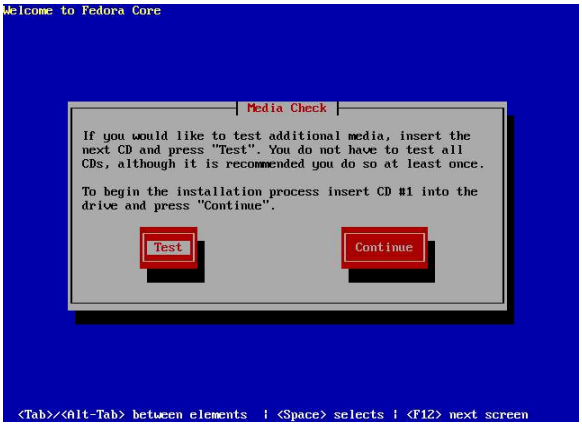

Figure 16. The Media Check process allows you to testing additional CDs or continue with installation.

Step 5. After selecting Skip in step 1b or Continue in step 5, the character based screen will scroll off the display as feedback about the installation process starts to appear, as shown in Figures 17 and 18.

Figure 17. Feedback about installation begins with a 'Running anaconda' line.

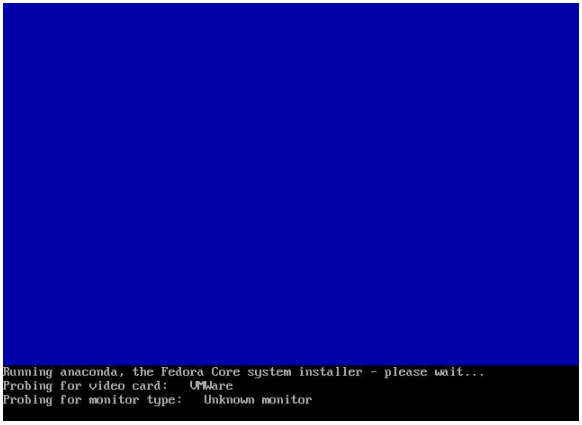

Figure 18. Feedback continues with lines about probing for devices.

After 30 to 60 seconds, a graphical X appears on the screen, then the Fedora Core Logo as shown in Figure 19. This means that the graphical subsystem has kicked in, and the rest of the installation will be done graphically, and (hopefully) with mouse support.

Figure 19. The appearance of the Fedora Core logo means that the graphical part of installation has begun.

The Installation screens

The Welcome screen appears to start off the installation wizard. It consists of a two pane dialog. Help text is in the left pane and tasks to perform are displayed in the right pane, as shown in Figure 20.

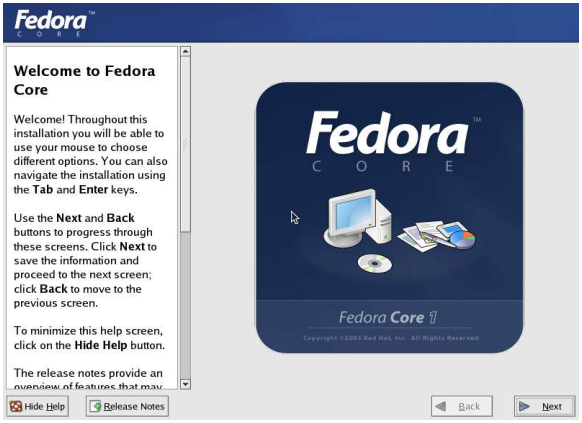

Figure 20. The Welcome to Fedora Core screen starts the installation wizard.

Welcome screen

Step 6. Click Next to get to the first installation screen, Language Selection, as shown in Figure 21. After carefully reading every word of the Welcome text in the left pane, of course.

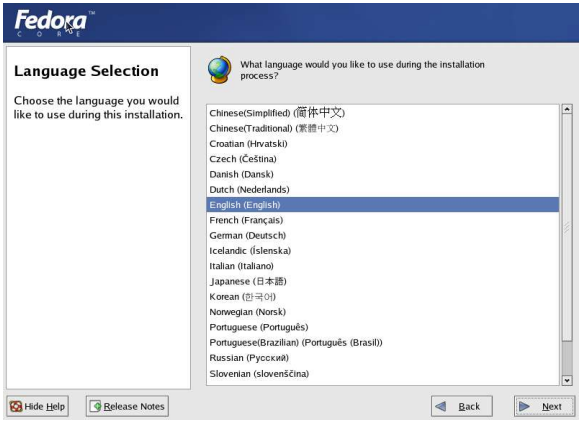

Figure 21. The Language Selection screen controls the installation process.

Language selection

Step 7. Choose the language you want to use during installation, and then click Next to get to the Keyboard configuration screen, as shown in Figure 22.

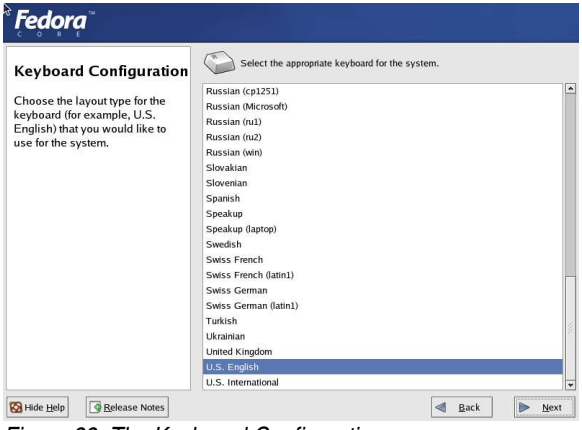

Figure 22. The Keyboard Configuration screen.

Keyboard layout

Step 8. Choose the keyboard layout you want to use on your system, then click Next to get to the Mouse Configuration screen, as shown in Figure 23.

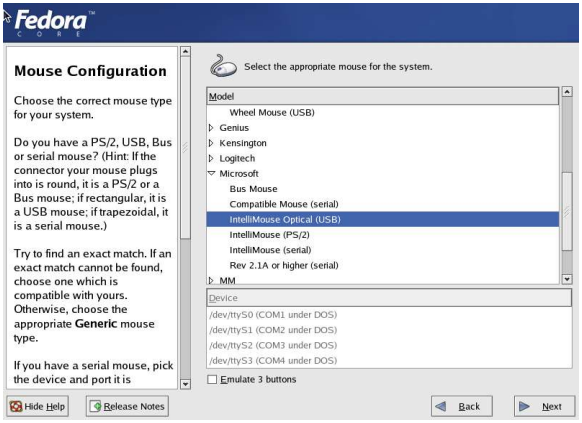

Figure 23. The Mouse Configuration screen.

Mouse configuration

Step 9. Select your mouse. Mine was detected as a Generic 3 button Mouse (USB) and I changed it to the right one - a Microsoft IntelliMouse Optical (USB). You may have to experiment a bit if you're using offbeat hardware. If your mouse only has two buttons, check the "Emulate 3 buttons" check box. Doing so enables you do click both buttons at the same time to take the place of clicking the middle button.

Then click Next to bring forward the Monitor Configuration screen, as shown in Figure 24.

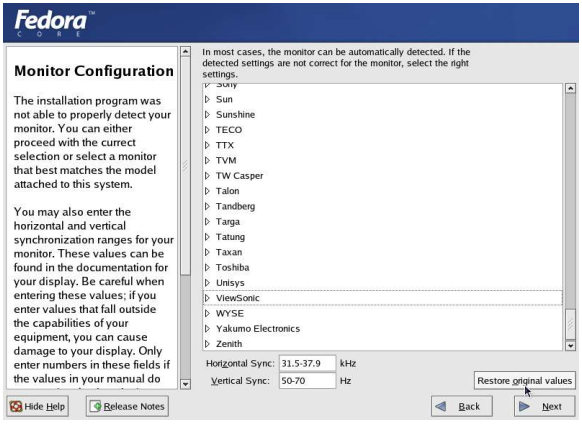

Figure 24. The Monitor Configuration screen.

Monitor configuration

Step 10. Again, depending on your hardware, your monitor may already have been detected and shown as selected in the screen. If not, you can either choose "Generic monitor" at the

very top of the list, manually choose your monitor if it's in the list, or choose the closest available choice to your monitor from the list. Then click Next to bring forward the Installation Type dialog, as shown in Figure 25.

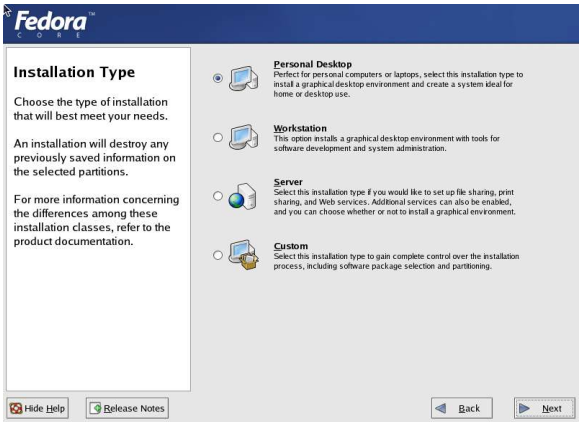

Figure 25. The Installation Type dialog.

Installation Type

The Fedora Core distribution comes with literally hundreds of software packages in addition to the basic Linux operating system. Office suites, Web browsers, email clients, drawing packages, PDF viewers, utilities as well as tools for administration, programming, and a variety of servers (such as email servers, network file servers, and Web servers) are all included on the three FC CDs. These packages, in toto, represent functionality for a wide variety of users, from power end users to programmers to server administrators. Not everyone would use all of these packages. Instead, each type of user would use a subset of packages.

As a result, most users will not install every single package, although that could be done if a user wanted to use a machine for purposes (not advisable unless you know what you' re doing.) Instead, most users will want to select a subset of packages that would be used for a particular type of use.

Since there are so many packages, it would be awkward, if not impossible, for most users to identify and install just the packages they want. Fedora Core comes with three pre-defined configurations of packages - one for power users (called "Desktop"), one for programmers (called "Workstation"), and one for server administrators (called "Server"). In addition, there is a fourth configuration where the user can customize their choices, but since you can customize the first three configurations too, it's not really necessary.

Step 11. Select the "Personal Desktop" option, since we're installing for an end-user machine. Then click Next to bring forward the Disk Partitioning Setup screen, as shown in Figure 26.

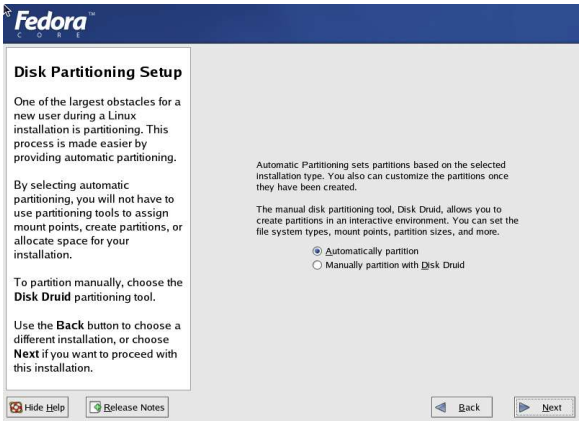

Figure 26. The Disk Partitioning Setup screen.

Disk Partitioning Selection

The Fedora Core installation wizard provides a number of options for partitioning your hard disk. (See the "Partitions" whitepaper on www.linuxtransfer.com for a detailed explanation of how partitions work with respect to Linux.) According to the Disk Partitioning Setup screen, you can have FC automatically create partitions or you can manually partition the hard disk yourself with FC's Disk Druid tool. If you choose automatic partitioning, FC will create several partitions by default that are good enough for many users. If you choose manual partitioning, you' llhave to create every partition yourself. Since, with automatic partitioning, you' llbe able to review and modify the default partitions through Disk Druid, there's no real advantage to selecting manual partitioning.

Step 12. Select "Automatically partition" and click the Next button to bring forward the Automatic Partitioning screen as shown in Figure 27.

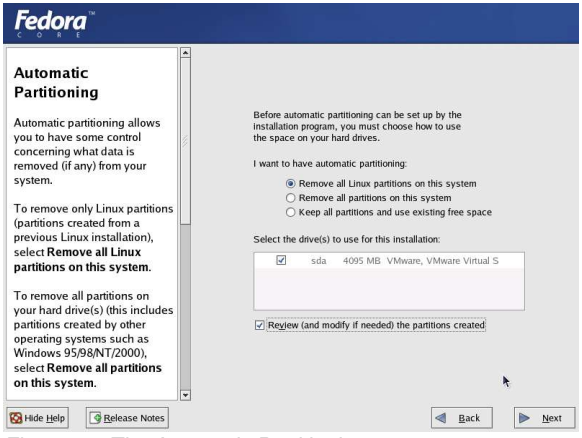

Figure 27. The Automatic Partitioning screen.

Automatic Partitioning

The Automatic Partitioning screen gives you choices regarding three functions. The first function about which you can make a choice is what specific action to take regarding which partition or partitions to use or modify. If your system has more than one operating system installed on it, you can choose to remove just the partitions used by Linux and leave the others (such as those used by games, Windows, and so on) alone.

The second action is to obliterate the entire hard disk, removing every partition on the disk and having it completely at your disposal when installing Linux.

The third action is to leave the existing partitions alone, and use free space (that is, disk space that hasn't been partitioned or formatted at all) for installation of Fedora. Obviously, this choice is only applicable if there is free space available.

Your next choice is which device (in other words, which hard disk) to use for the installation. Again, this choice is only applicable if you have more than one hard disk in the machine.

The third choice to make is whether or not to review the partitions created automatically by the installation routine via the check box at the bottom of the screen. Even if you wouldn't even dream of making changes to the values chosen for you, it's a good idea to review the partitions just to learn more about what's going on under the hood.

Step 13. Select the action appropriate for your installation (if you're using a box exclusively for Fedora Core, select "Remove all partitions"), select a device, if necessary. If you check the "Review" check box, you can find a description of what you'll see in Options section later in this whitepaper. In the Automatic Partitioning screen, click Next to advance to the Boot Loader Configuration screen, as shown in Figure 28.

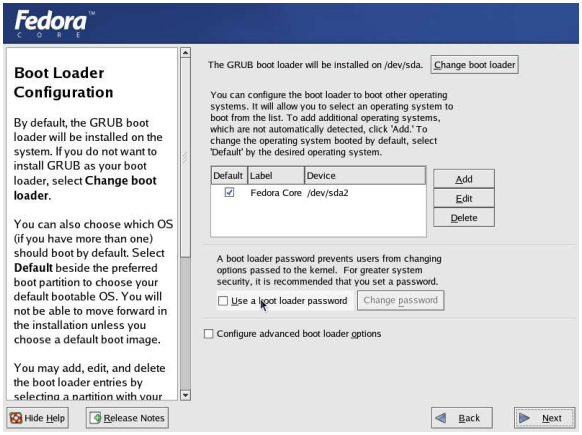

Figure 28. The Boot Loader Configuration screen.

Boot Loader Configuration

The Boot Loader Configuration screen is one of the wonderful screens in the installation wizard, as it can be clicked through with nary a second thought if you don't want to mess with

anything, yet gives you access to all sorts of advanced configuration options in one handy place, should you need them.

Since this is an introduction to installing Fedora Core, I'm going to assume that you're not going to want to mess with the boot loader at this point. You can find a description of what you'll see if you select some of the Boot Loader options in the Options section later in this whitepaper.

Step 14. In the Boot Loader Configuration screen, simply click Next to move to the next step, the Network Configuration screen, as shown in Figure 29.

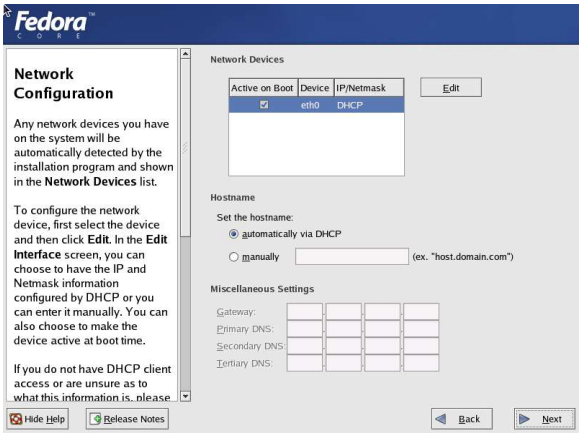

Figure 29. The Network Configuration screen allows you to determine how IP addresses and hostnames will be assigned.

Network Configuration

The default choice for the Network Configuration is DHCP (Dynamic Host Configuration Protocol). This means that the IP address the computer users is dynamically assigned by another computer. This is the default for many desktop computers, so we're going to go with it. You can use the Edit button in the upper right corner to assign a static IP address. Details are provided in the Options section later in this whitepaper.

Step 15. Click Next to move to the Firewall Configuration screen, as shown in Figure 30.

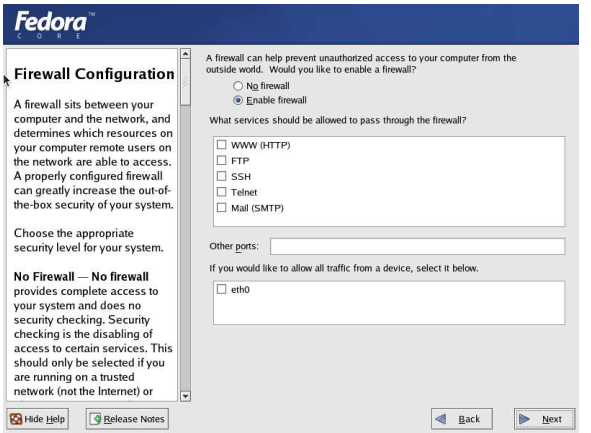

Figure 30. The Firewall Configuration dialog allows you to configure a personal firewall in a number of ways.

Firewall Configuration

A firewall is a vehicle for controlling what types of traffic are allowed to access your machine from the network. Fedora Core includes a software firewall that is turned on by default, via the "Enable firewall" option button. You can optionally permit selected services to pass through the firewall by checking the appropriate check boxes in the middle of this screen.

Step 16. Leave "Enable firewall" selected, don' **t** check any of the services or device check boxes in the other sections, and click Next to move to the Additional Language Support screen as shown in Figure 31.

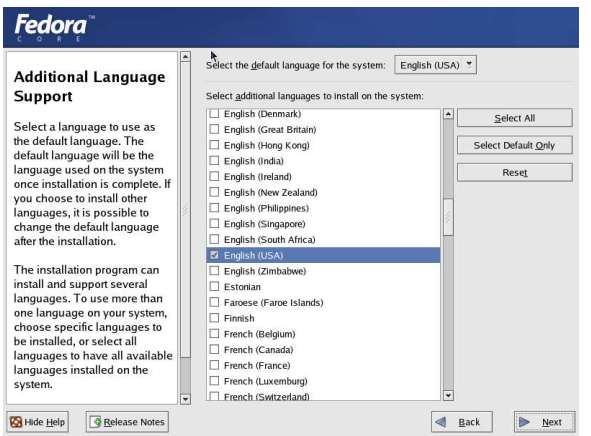

Figure 31. The Additional Language Support screen allows you to choose the default language and additional languages for optional use.

Additional Language Support

Every system uses a default language, which is already selected in this screen. You can have additional languages available as options by installing them here.

Step 17. Select the default language to be used for the system. Select additional additional languages if you want them to be available as options later. Then click Next to move to the Time Zone Schedule screen, as shown in Figure 32.

Figure 32. The Time Zone Selection screen allows you to set the system time graphically.

Time Zone Selection

The Time Zone Schedule screen allows you to set the system time graphically.

Step 18. Select the dot nearest your locale in the world map. Alternatively, you can scroll through the entries in the drop down box under the map. Check the UTC check box if you want your system clock to take Daylight Savings Time into account. Then click Next to move to the Set Root Password screen, as shown in Figure 33.

Figure 33. The Set Root Password dialog should be used to create a secure password for the system.

Set Root Password

The root password provides access to the root user's account. "Root" is akin to Administrator on a Windows system, although more powerful in that Root on a Linux system can perform more functions than an Administrator on a Windows computer. As such, it's important to set a very strong password for the Root user.

Step 19. Set the Root Password, repeat it, and click the Next button. The "Reading packages" dialog appears for a moment, and then is replaced by the Package Installation Defaults screen, as shown in Figure 34.

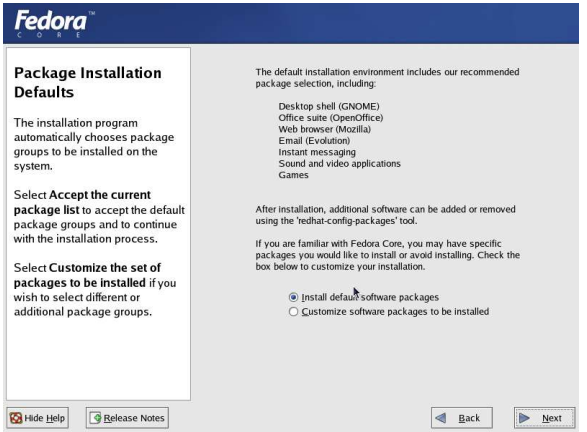

Figure 34. The Package Installation Defaults screen allows you to accept or modify the default software.

Package Installation Defaults

The selection of one of the four Installation Types in Step 10 earlier (Figure 25) drives the assembly of a list of packages that will be installed. At this step, you will now have the chance to modify the list of packages.

Step 20. If you want to accept the default set of packages, keep the "Install default software packages" choice selected. If you want to be able to modify the list of packages, select the "Customize software packages to be installed" option button.

In both cases, click Next. If you selected "Install default", continue reading with step 22. Otherwise, continue with the next step.

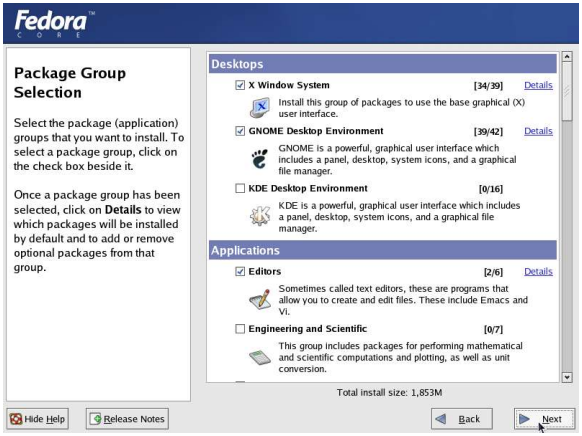

Figure 35. The Package Group Selection screen displays the selected packages for the Installation Type you selected in Figure 25.

Package Group Selection

The Package Group Selection screen displays the packages that are selected by default due to the Installation Type you selected in Step 10 and shown in Figure 25.

Which packages you select at this point is purely a matter of personal choice and personality. Some people like to install everything under the sun, finding it handy to have anything they might need at arms length. Others, on the other hand, want to keep things to a minimum - figuring that the less software that's installed means the fewer potential security holes are around, and makes use of the system less confusing, due to fewer choices to deal with. It's up to you which way you want to go. A full installation will run about 5 GB while a minimal installation will be closer to 1.0 GB. You can even have the installer select a minimal configuration or install everything (including some items not listed in the separate package groups), as shown in Figure 36.

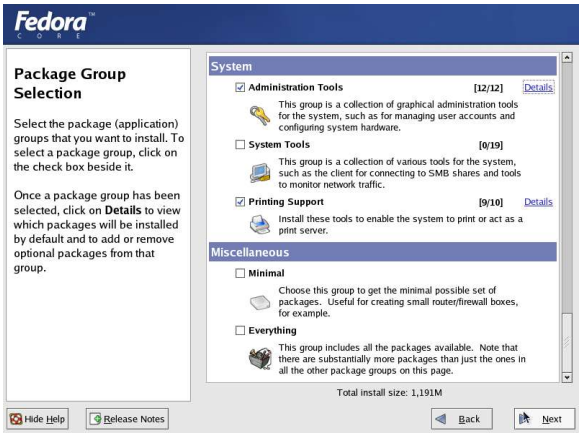

Figure 36. Use the Minimal or Everything check boxes at the bottom of the Package Group Selection screen to quick make ' all or nothing' choices.

That said, I would suggest that you consider including the following items:

KDE Desktop Environment - all packages. There are a number of nifty little widgets that come along with KDE.

Office/Productivity Packages - GnuCash is similar to Quicken. GPDF and XPDF allow you to view PDF files.

Sound and Video - all packages.

Administration Tools - all packages.

System Tools - samba client. This enables you to communicate with other computers on your network.

If you find that you' ve installed too much (or too little), you can add and remove packages through the System Settings | Add/Remove Packages option.

Step 21. Once you' ve selected the packages you want, click Next to move to the About to Install screen, as shown in Figure 37.

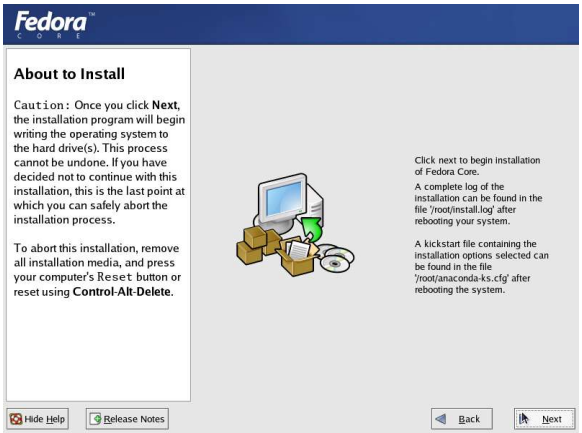

Figure 37. The About to Install screen is your last chance to abort the installation.

About to Install

The About to Install screen is your last step in the installation wizard. The wizard claims that this screen is your last chance to make changes to choices you've made so far as well as to simply cancel the installation completely, but the wizard lies.

Once installation begins, notes regarding the progress are stored in a text file named "install.log" and stored in the /root directory. If anything goes wrong during installation, you can examine this file for clues about what might have happened (or not happened.)

Step 22. Click Next and the Required Install Media dialog will appear, as shown in Figure 38.

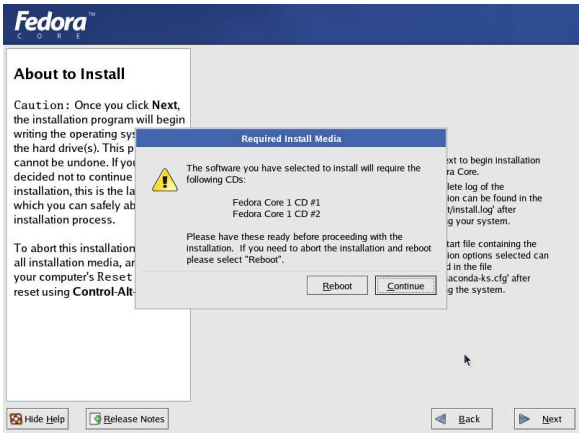

Figure 38. The Required Install Media dialog describes which CDs will be needed during the installation.

Required Install Media

The Required Install Media dialog lists which CDs will be needed during the installation, and is your actual last chance to abort the installation. The list of CDs varies according to which Installation Type you selected and which packages you chose in earlier steps.

Step 23. Once you've assembled the CDs you're going to need, click Continue to move to the Installing Packages screen as shown in Figure 39.

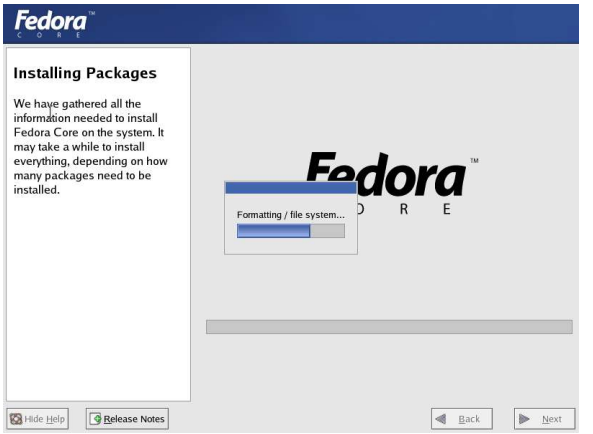

Figure 39. The Installing Packages screen is overwritten by a series of progress dialogs. The first dialog indicates the progress of the file system format.

Installing Packages

Once the Installing Packages screen in the wizard appears, a series of dialogs pop up. These dialogs contain progress bars and describe the steps involved in preparing the system for installation of the software packages. Figures 39 through 42 show these dialogs.

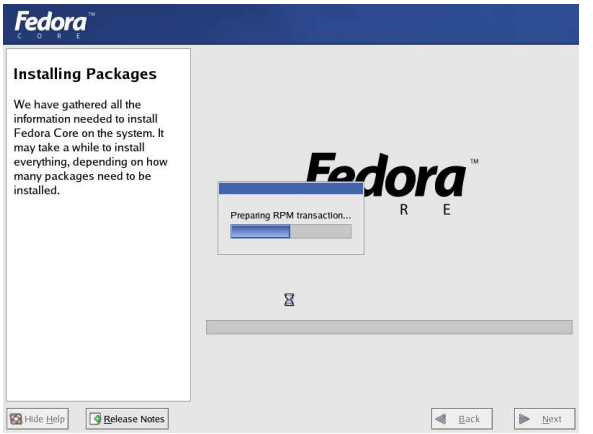

Figure 40. The Preparing RPM transaction dialog is second to display.

Figure 41. The third dialog alerts the user to the start of the software installation itself.

Figure 42. The final progress dialog continues the installation startup alert.

Installation takes between 40 minutes and an hour and half, depending on the horsepower of your machine and the number of packages being installed. After the progress dialogs disappear, the wizard screen displays another thermometer bar that indicates the progress of the installation, as shown in Figure 43 and Figure 44.

Figure 43. After the progress dialogs disappear, a thermometer bar displays in the wizard.

Below the thermometer bar, the name and description of each package is listed as it is installed.

Figure 44. The text below the thermometer bar displays the name and description of the package currently being installed.

Step 24. Eventually you'll be asked to swap in CDs 2 and/or 3. Once the installation program is done installing all of the software packages, another progress dialog will appear, identifying the post-installation configuration step, as shown in Figure 45.

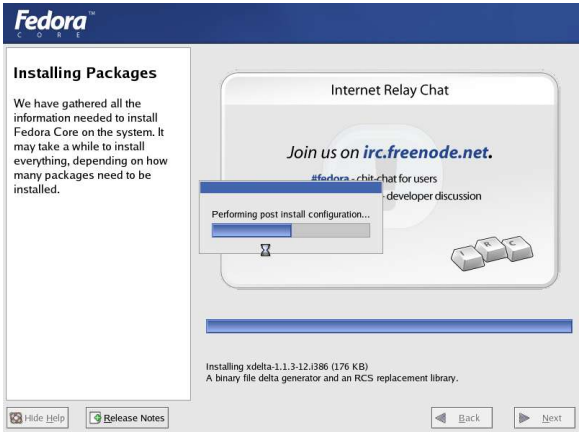

Figure 45. The progress dialog identifies that post-installation configuration is taking place.

Once the installation of the packages is complete, it's time to perform one more housekeeping task - creating a boot diskette - as shown in Figure 46.

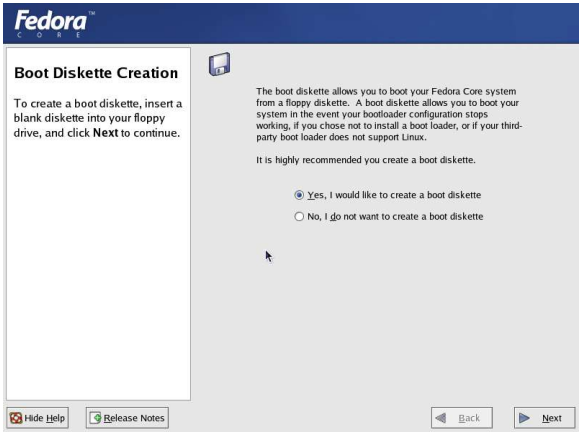

Figure 46. After installation is complete, you are prompted to create to a boot diskette.

Boot Diskette Creation

A boot diskette contains the minimum information needed to start your Linux machine in the event that information on the hard disk (such as the Master Boot Record) gets corrupted.

Step 25. Since this is your first Linux machine, it's a good idea to create one now. It takes about a minute, and remember that all of the information on the diskette will be overwritten by this process. Once the boot diskette creation process is complete, take it out of the diskette drive, and label it with today's date, the name of the computer, the name of the distribution (such as "Fedora Core 1"), and the words "Boot Diskette", so you can remember what it's for when you need it three months from now. Store it with your Fedora Core CDs.

Click Next when you're done with the boot diskette and you'll be greeted by the Congratulations screen as shown in Figure 47.

Figure 47. Congrats! You're done!

Congratulations!

You're done! Well, not really. There are a few more housekeeping tasks, but first you have to reboot - your first and only reboot necessary during the entire installation process.

Step 26. Take all removable media out of their drives (floppies and CDs), and click Reboot. The machine will restart, and you'll see prompts during the restart much like you did in Figures 8 and 18. See Figure 48.

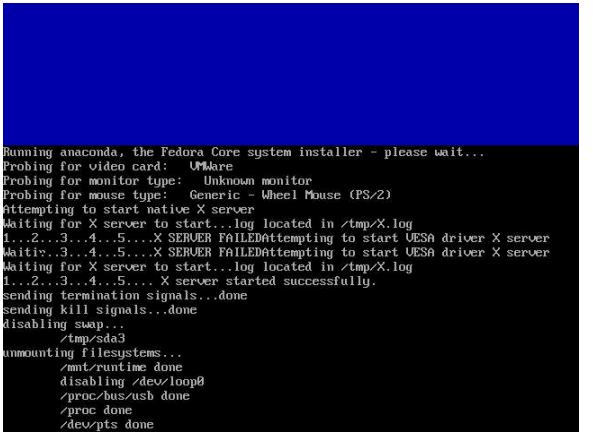

Figure 48. After rebooting, prompts track the progress of the restart process.

Final Setup

The rebooting process will switch from a character-based set of prompts to a graphical display shortly, and a thermometer bar will display on the Fedora Core logo' dcreen, as shown in Figure 49.

Figure 49. The Fedora Core startup screen displays a thermometer bar that indicates its progress.

Unlike previous versions of Red Hat Linux, FC will keep the details hidden from you by default. However, you can see the same character-based progress prompts scroll by if you click on the "Show Details" hyperlink under the left side of the thermometer bar. Doing so will bring forth a blank screen as shown in Figure 50.

Figure 50. The character based progress prompts screen before any results are displayed.

As startup continues, the thermometer bar at the top of the screen will make its way to the right, and prompts will begin to display, as shown in Figure 51.

Figure 51. Character-based prompts will start to display below the thermometer bar.

As each step passes, a green "OK" response is displayed. If a startup operation fails, a corresponding red "FAILED" response will be displayed, as shown in Figure 52.

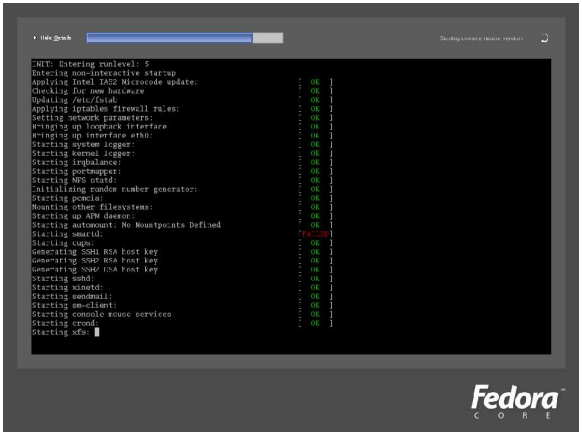

Figure 52. If a startup operation fails, it will display a red error message.

Unless a catastrophic error occurs (in which case you'd examine the install.log file in the root directory for more information), the Welcome screen appears, as shown in Figure 53.

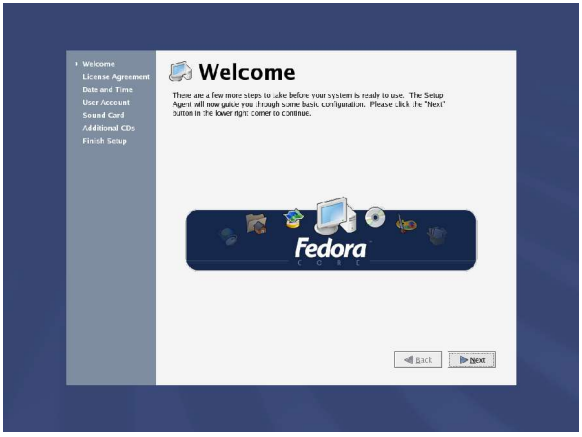

Figure 53. The Welcome screen of the Final Setup process.

Welcome

The Welcome screen is similar to the installation wizard, except that the remaining steps are listed on the left side and all explanatory text is contained on the right.

Step 1. Click Next to move to the License Agreement screen, as shown in Figure 54.

Figure 54. The License Agreement screen asks you to accept or reject the license.

License Agreement

The License Agreement screen, while looking like lots of other license screens, simply serves to confirm that Fedora Core is developed under the GPL, and explaining Red Hat's role in the process. You'll have to accept the agreement to continue, but you're not signing your life away like you do with proprietary software license agreements.

Step 2. Click Next to move to the Date and Time screen, as shown in Figure 55.

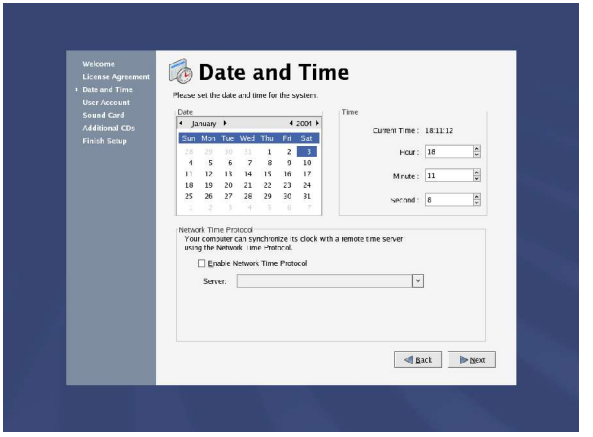

Figure 55. The Date and Time screen allows you to confirm the system time and configure your system to synchronize it with a remote time server.

Date and Time

You can perform three tasks in this screen. First, you can set the system date using the calendar widget on the left. Second, you can set the system time, using the Hour, Minute and Second spinners on the right.

Third, you can configure your system to automatically synchronize with a remote time server with the Enable Network Time Protocol check box and Server drop down combo box at the bottom. Checking the check box will enabled the drop down combo box as shown in Figure 56, and provide choices for remote servers.

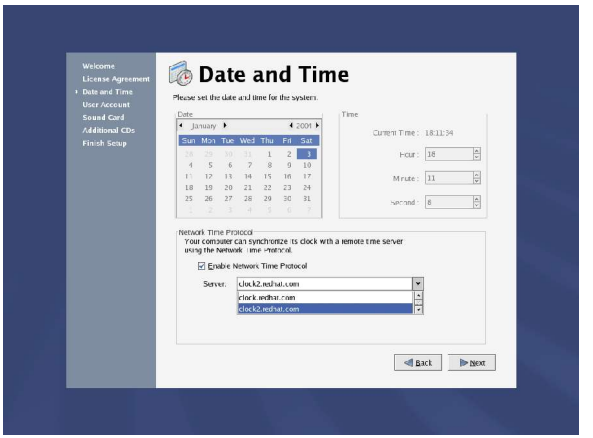

Figure 56. The Server drop down combo box provides pre-defined choices for remote time servers.

Step 3. Set the date, time, and, if desired, enable NTP and select a remote server. Then click Next to move to the User Account screen, as shown in Figure 57.

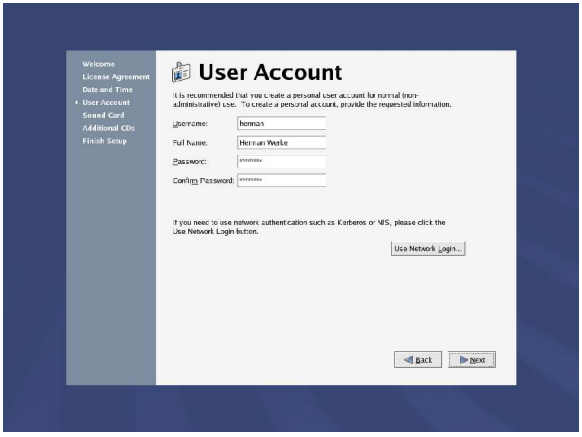

Figure 57. The User Account screen allows you to create day to day accounts.

User Account

The root user should only be used when performing administrative duties on the computer that can' **b**e done any other way. For general use, you should have a second account to use on a day to day basis. All other users of the computer should also either use that same account, or, preferably, use their own account. This screen is used to create one or more user accounts.

This account is stored on the local machine. If you want to create a network login (for example, to log into a Linux or Windows server), click the Use Network Login button. This going to be covered in another whitepaper in more detail.

Step 4. Enter a username, the full name of the user (optional, but recommended if more than one person will be using the computer), and a password. Click Next to move to the Sound Card configuration screen as shown in Figure 58.

Figure 58. The Sound Card configuration screen allows you to ensure that the sound card on the machine works properly.

Sound Card

The Sound Card configuration screen allows you to confirm that a sound card, if found, is operating properly. If detected, the sound card is identified, and you are offered the chance to test it.

Step 5. Click the Play Test Sound button. A sound will be played out of each speaker in turn, and then out of both speakers at the same time. Then you are asked if you heard the sounds properly, as shown in Figure 59.

Figure 59. Sound Card detection confirmation.

If you heard the sounds properly, click Yes; else, click No. If you click No, you'll be given the chance to configure the sound card manually.

Step 5a. After you are done, click Next to move to the Additional CDs screen as shown in Figure 60.

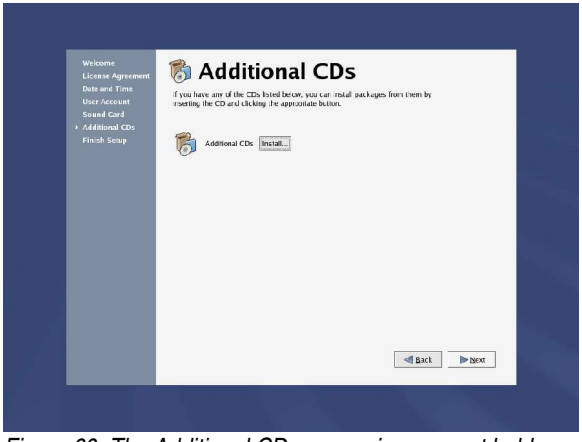

Figure 60. The Additional CDs screen is an errant holdover from Red Hat 9 days.

Additional CDs

You can giggle now if you like. The Additional CDs screen says "If you have any of the CDs listed below..." but there aren't any CDs listed. This screen is an errant holdover from the installation routine in Red Hat 9.0 and earlier.

Step 6. Just click Next to move to the Finish Setup screen as shown in Figure 61.

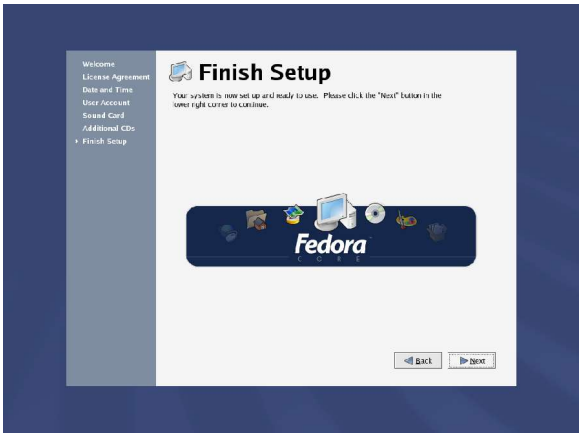

Figure 61. Final Setup - you're almost done!

Final Setup

The Final Setup screen simply confirms that installation is complete.

Step 7. Click Next to finish installation and move to the Login screen, as shown in Figure 62.

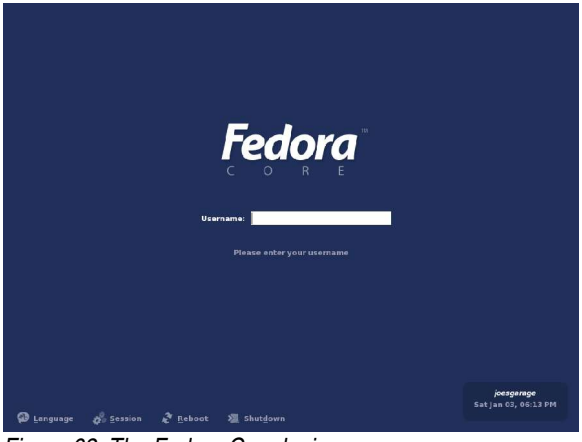

Figure 62. The Fedora Core login screen.

Login

The Login screen is somewhat different than what you're used to in terms of Windows, since there's only a single text box for entering a username. Once you enter a username and press Enter or tab out of the text box, the username text box is replaced by a password text box, as shown in Figure 63.

Step 1. Enter a username and press Enter.

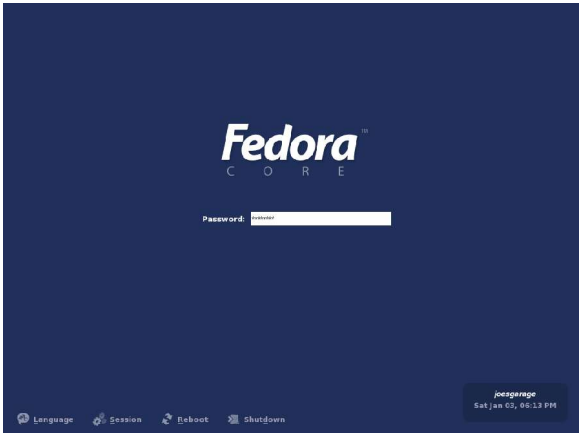

Figure 63. The Username text box turns into a Password text box.

Like the Username text box, the Password text box is longer than most mortals will ever need (ever run into one of those paranoid types who uses a 57 character password?).

Step 2. Enter your password and press Enter to log in. If your username and password are accepted, icons will start displaying on the bottom of the Fedora Core logo screen, as shown in Figure 64.

Figure 64. Upon successful log in, the Fedora Core logo screen appears.

The icons represent startup of various services - if you watch carefully, you'll see descriptions of each service displayed underneath the line of icons. Finally, the default Fedora Core desktop displays, as shown in Figure 65.

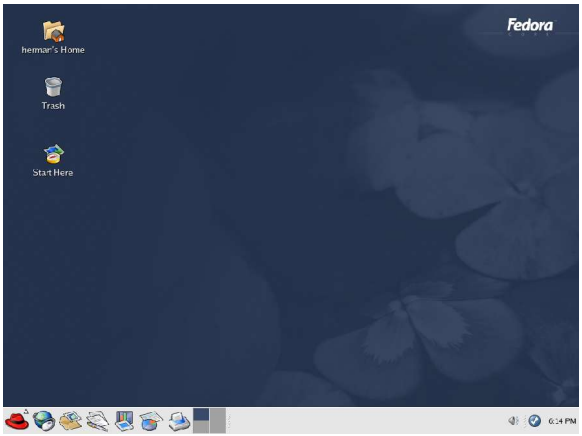

Figure 65. The default Fedora Core desktop.

In order to shut down, click on Red Hat icon in the lower left corner of the screen, and select the Log Out menu option. You can choose to simply log out, to reboot the machine, or to shut the machine down completely.

If you log out, the Username log in screen will be displayed just as it was in Figure 62. If you either reboot, or start the machine up after shutting it down, you'll be greeted by the boot menu screen, as shown in Figure 66.

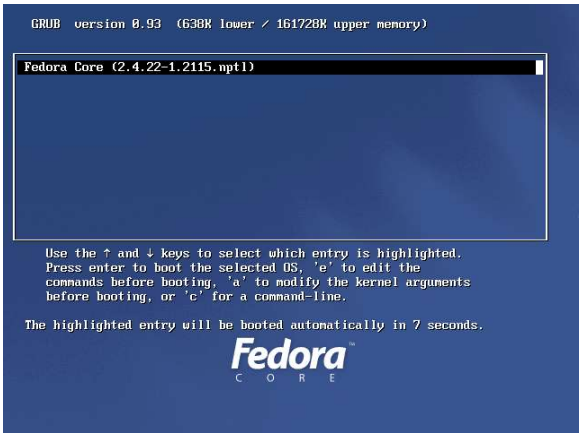

Figure 66. The boot menu screen displays upon reboot or machine startup.

If you don't press Enter within ten seconds, Fedora Core will be started automatically, and you'll soon be greeted by the Username log in screen as described earlier.

And that's that!

Advanced Topics/Alternatives/Options

Installation doesn't simply consist of a single path, straight and narrow. As you've seen, there are a number of choices you can make along the way, such as partitioning, setting IP addresses, and so on. In this section, I'll discuss each of these alternatives.

Modifying automatic partitioning's choices

In Step 12 of The Installation Screens section, you had the choice to examine (and modify) the choices made by the installation routine's automatic partitioning mechanism. At the time, we just accepted the defaults and moved on. Now we'll look at how to modify those choices and suggest some alternatives.

If you check the "Review Choices" check box in Figure 27, Fedora Core's installation routine will create three partitions and then display them for you when you click the "Next" button in Step 12. This display looks something like that shown in Figure 67.

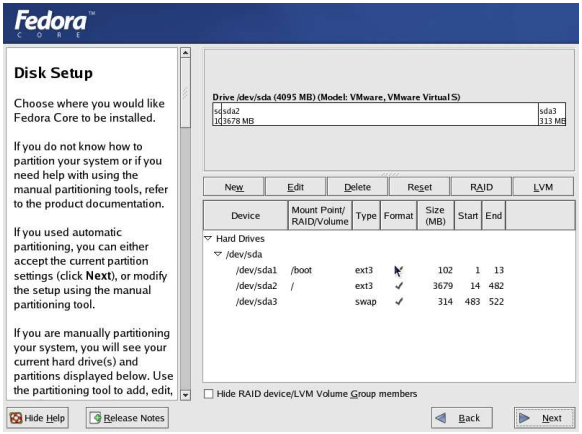

Figure 67. The Disk Setup screen, showing the default partitions created by FC.

There are two parts to the right pane of this screen. The first is the drive bar across the top of the pane, showing you graphically how the hard disk is divided up into partitions. (If your computer has more than one hard disk, there will be a separate bar for each disk, stacked one above another, with each stretching all the way across the screen.)

The second part is the list of device, drives and partitions on each drive in the bottom half of the right pane. Figure 67 shows one hard disk with three partitions. The first row shows the device name, and subsequent rows identify each partition, together with information about that partition.

If there is a second disk, it will be listed after the last partition of the first disk, with rows for each of its partitions and their information under the row for the disk itself.

Selecting a partition in the device list will also highlight the partition in the drive bar, as shown in Figure 68.

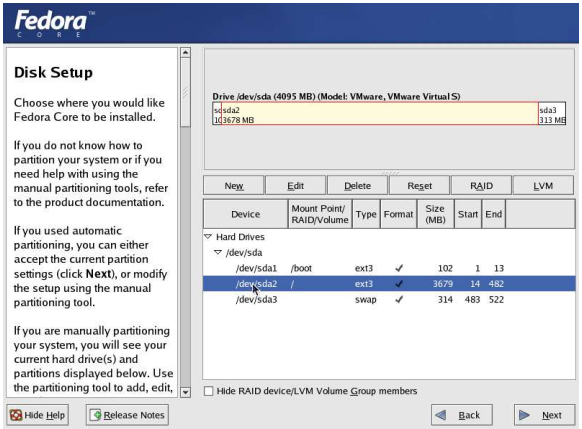

Figure 68. Selecting a partition in the Disk Setup screen also highlights the partition in the drive bar at the top of the screen.

Automatic partitioning creates three partitions by default - one for swap, one for /boot, and one for /, as you can see in Figure 68. If you want to modify this configuration, you can do so with the buttons between the drive bar and the partition list. For example, suppose you wanted to create another partition. Assuming there was no available disk space, you would have to resize one of the existing partitions to create some available space, and then create a new partition in that newly freed-up space.

Specifically, here are the steps you would to create a fourth partition for /home by taking some of the space used by /. First, highlight highlight the / partition in the device list, as shown in Figure 68. Second, click the "Edit" button to bring forward the Edit Partition dialog as shown in Figure 69.

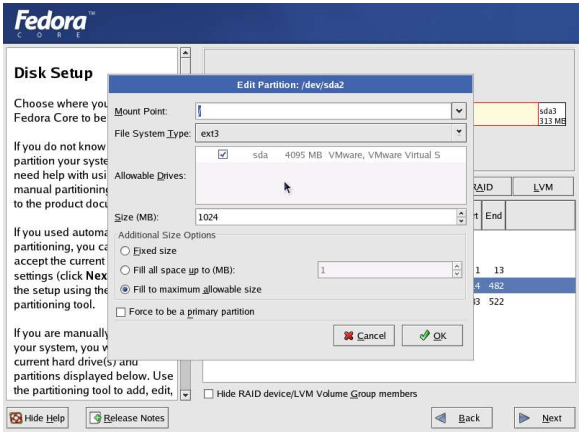

Figure 69. The Edit Partition dialog allows you to change attributes of an existing partition.

The Edit Partition dialog allows you to modify attributes of the partition, including the size, how the size is determined, the mount point, and so on. For the purposes of this example,

reduce the size of the 3679 MB / partition by half a gigabyte. This will leave that half gigabyte free, and with which you can create another partition. (As a matter of practicality, leaving 3179 MB for the / partition may not be enough, depending on how much software you are planning installing on the system.) Click OK and you're returned to the Disk Setup screen.

Next, click the New button to bring forward the Edit Partition dialog again. (Yes, I know you're not editing an existing partition, but that's what the dialog says.) Since you're creating a brand new partition, you should go through each object in the dialog in turn. First, select the mount point from the Mount Point drop down list box, as shown in Figure 70. In this example, that's /home.

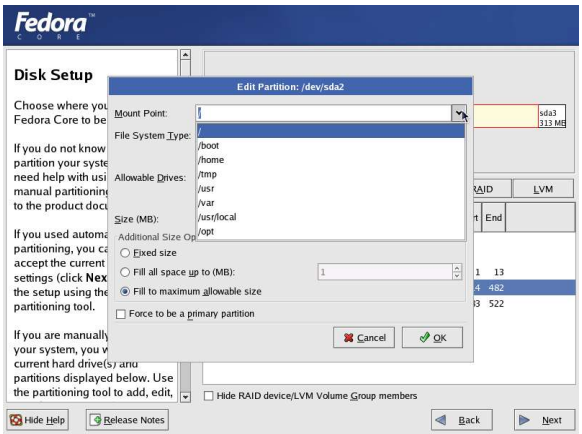

Figure 70. The Mount Point drop down combo allows you to assign a mount point to the partition being edited.

Second, click on the "Fixed Size" option button. Then enter "500" in the "Size (MB)" text box. Third, click OK to return to the Disk Setup screen.

As an aside, remember that you can only have four primary partitions on a single hard disk. If you want to create more than four partitions, you can keep clicking "New" and adding partitions to your system, assuming you've got the disk space for it. Disk Druid will automatically create an Extended partition and Logical partitions within that Extended partition as needed. If one of the partitions you're creating absolutely has to be a primary partition, click the "Force to be a primary partition" check box in the Edit Partition dialog. One of the existing primary partitions will be converted to a logical partition.

Customizing the boot loader options

The two things I'm going to mention with respect to boot loaders aren't necessary during your first (or even your fifth) installation. However, they're nice to know, and may come in handy as you become more experienced.

Writing to the Master Boot Record

The first item is determining whether or not this installation is going to write the boot loader to the Master Boot Record. This is done during Step 14 of The Installation Screens section. If you don't understand about writing boot loaders now, don't worry - file it away for later. Click on the Change Boot Loader button in the upper right of the screen shown in Figure 28 to bring forward the Change Boot Loader dialog as shown in Figure 71.

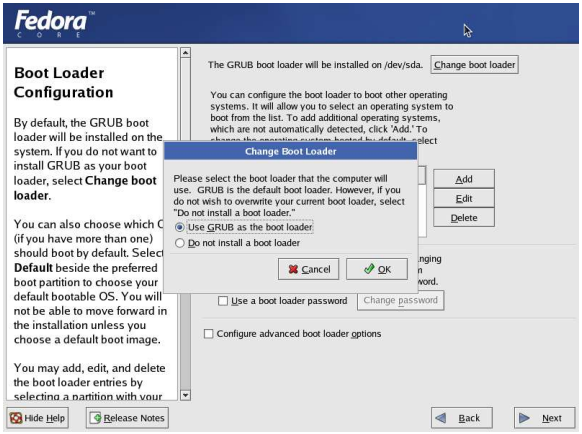

Figure 71. The Change Boot Loader screen allows you to prevent the boot loader from being written to the Master Boot Record.

If you want to install GRUB into the Master Boot Record as the boot loader for this installation (which is the default), you'd do nothing in this dialog. However, if you do NOT want to install a boot loader into the Master Boot Record for this installation of Fedora Core, select the "Do not install a boot loader" option button and then click the OK button. This option comes in handy if you're installing Fedora Core on a machine that already has an operating system that has its own boot loader in the Master Boot Record, and you don't want to mess with it.

Editing the boot loader's label

The second item that is useful is editing the label on the current boot loader. When you are done with installation and start up your machine, you'll be presented with a boot menu like that shown in Figure 66 earlier in this chapter. As you can see, there's only one choice available, and the text on it has already been determined.

There are a couple of reasons that you might want to change the text. Perhaps you just want it your own way. A more common reason is that if you install other operating systems, or if you install updates to this Linux installation, there will be multiple choices in this boot menu, like so:

```
Fedora Core (2.6.08-1.0189.nptl)
Fedora Core (2.4.24-1.2222.nptl)
Fedora Core (2.4.22-1.2115.nptl)
```

You might want text labels that are more descriptive, that might remind you what the differences between the various choices are, like so:

```
FC 1 - 2nd 2.6 kernel (2.6.08-1.0189.nptl)
FC 1 - new NVIDIA drivers (2.4.24-1.2222.nptl)
FC 1 - original install (2.4.22-1.2115.nptl)
```

In order to do so, highlight the Fedora Core line in list box in the middle of the right pane, and then click the Edit button immediately to the right of the list box. The Image dialog, as shown in Figure 72, will be displayed.

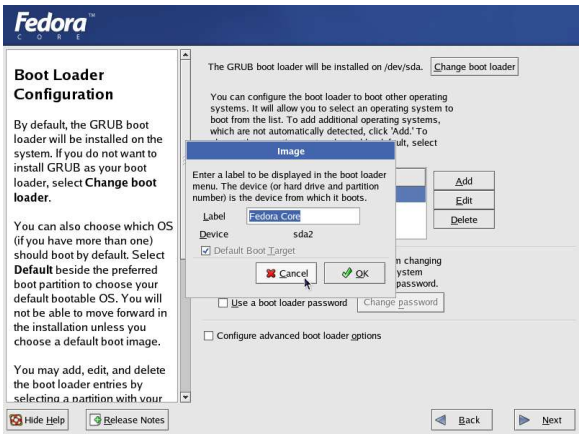

Figure 72. Changing the description of the operating system title in the boot menu.

Change the value in the "Label" text box, and click OK, in order to change what displays in the boot menu.

Assigning static IP addresses instead of DHCP

In Step 15 of The Installation Screens section, you assumed that you were going to use DHCP so that your computer would automatically be assigned an IP address by another box as necessary. What if you want to manually assign an IP address to your computer and have it stay the same all of the time - in other words, use a static IP address.

Technically, the IP address isn't assigned to your computer, but to the Ethernet card inside your computer that connects your machine to the network. If you have more than one Ethernet card in your computer, you would have more than one entry in the Network Devices list box in the top half of Figure 29.

In order to assign a static IP address to a specific Ethernet interface, highlight the interface of interest in the Network Devices list box, and click the Edit button in the upper right corner of Figure 29 to bring forward the Edit interface dialog as shown in Figure 73.

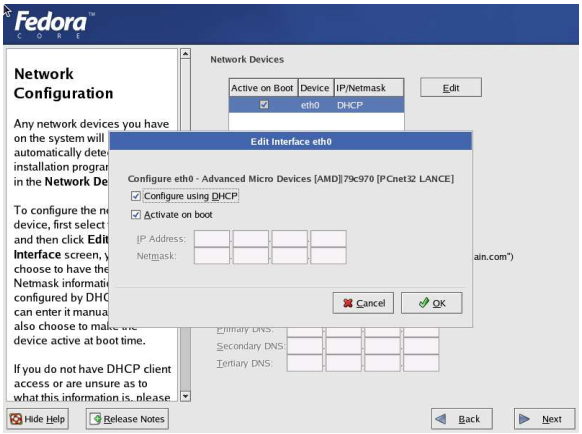

Figure 73. The Edit interface dialog is used for assigning a static IP address to a computer's ethernet card.

This dialog is used for entering data for the specific Ethernet interface that was highlighted in the Network Configuration screen (you can see this behind the Edit Interface dialog in Figure 73). That's why the title bar of the dialog identifies the name of the device.

First, uncheck the "Configure using DHCP" check box. Doing so will enable the IP Address and Netmask text boxes below.

Second, enter the static IP Address you want to assign to the Ethernet interface, and the Netmask of the device as well. See Figure 74 for an example.

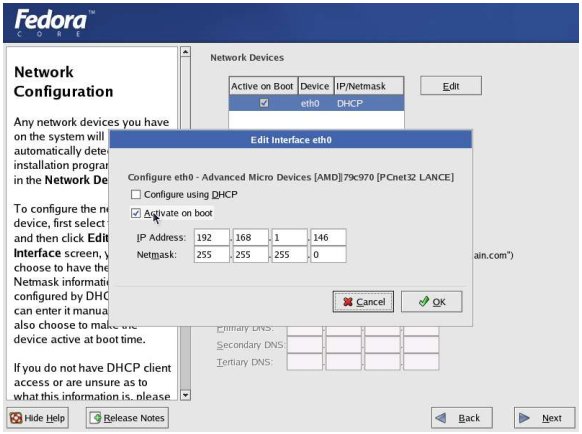

Figure 74. Entering the static IP address for an Ethernet interface.

Finally, click OK to get back to the Network Configuration screen, as shown in Figure 75.

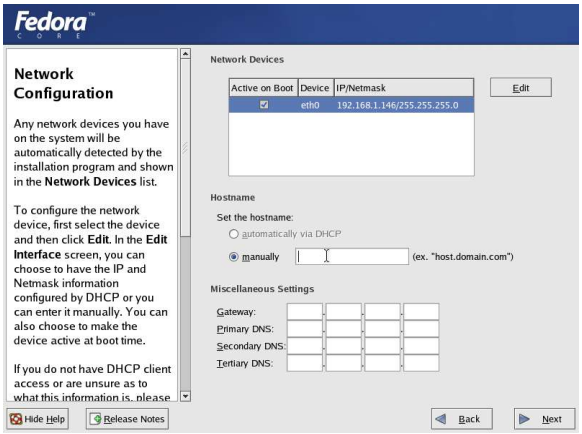

Figure 75. The Network Configuration screen, ready for a manually entered hostname.

The next step is to assign a name to the machine you' reworking on, instead of letting the machine get a name automatically assigned to it (via DHCP.) Click on the "manually" option button in the Hostname area. Doing so enabled both the hostname text box and all of the text boxes under the Miscellaneous Settings label.

Enter a hostname for the machine. You can enter simply a label, as shown in Figure 76, or enter a fully qualified hostname as the example on the screen (host.domain.com) shows.

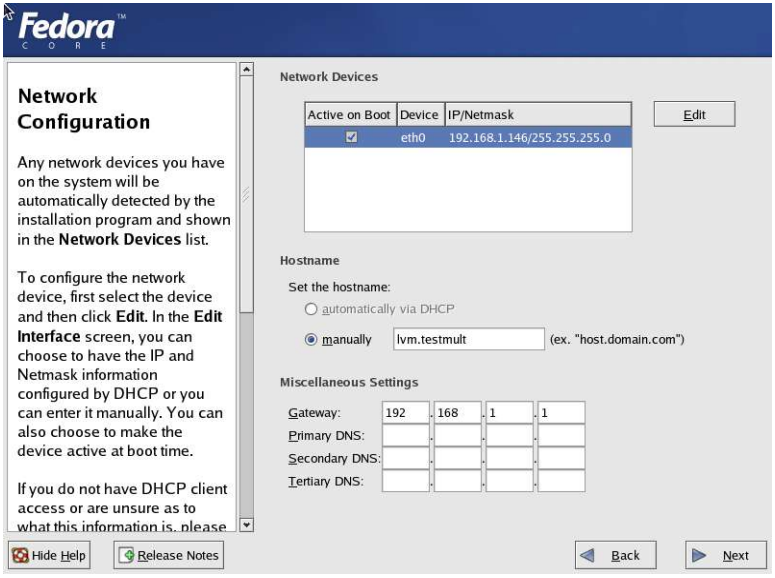

Figure 76. A manually entered hostname and gateway address.

You can also enter the IP address for the Gateway machine on your network (such as the IP address of your router) and the IP addresses for your DNS servers.

Then click the Next button, and you're all done with setting static IP addresses.

Quick Cookbook

*\\\ Do I need a 'quick cookbook' for a basic installation?

Summary

Installing Fedora Core on a PC is an easy task in 2004 - FC recognizes a great deal of hardware and the wizard's user interface is as smooth and bug free as I've encountered in the Linux world. While some of the terminology may need a bit more work before I'd turn it over to a complete novice, the installation is definitely ready for prime time as far as power users go.

For updates to this whitepaper as well as other HOWTO whitepapers on a variety of subjects, please visit www.hentzenwerke.com.